Do share buybacks create value for the shareholders?

An empirical test of the absolute and relative returns of share buybacks conducted by Danish companies between 2000 and 2010

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Resume

This thesis analyses share buyback conducted by Danish companies during 2000 to 2010. Share buybacks has become increasingly popular and so it is of interest for the shareholders to evaluate whether share buybacks create any value compared to distributing the cash as dividends.

I have chosen to analyse the possible shareholder value creation via a simple approach namely by using absolute returns and relative returns. This approach has been chosen as the absolute return reflects the actual value created – or destroyed – by the share buyback and as such it can be easily evaluated whether the buyback was a success or not.
Furthermore I calculate a return relative to a broad benchmark in order to see what return professional investors who hedge or diversify their investments would have earned on the share buybacks.

My analysis show that the more than half of the buybacks in the sample had a negative absolute total return in both 1,2,3 and 4 years of -1,5% -0,8% -7,8% and -21,6%. Similarly more than half of the buybacks had negative relative return in all periods. The relative return was in general lower than the absolute return indicating that the negative absolute return was not due to a general development in the stock market. The conclusion drawn is that share buybacks in general do not create value for shareholders as both the absolute and relative return is negative.

My analysis also shows that in general it is not possible to classify a share buyback as either good or bad. The correlation in return from year to year is more or less random which further supports the conclusion that companies do not add value for the shareholders by conducting share buybacks.

Finally I test if company size and price-to-book ratio has any influence on the return. Unlike what international studies have shown I find that larger companies have higher returns on their share buybacks than smaller companies. The results on price-to-book ratio is mixed as the absolute return supports the theory that low price-to-book companies should earn higher returns. But the relative return analysis show the opposite result so no clear conclusion can be drawn on this subject.

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Appendix: See attached CD-rom

Research question:

Share buybacks has during the last 30 years become increasingly popular as a way to distribute excess cash to shareholders. The phenomenon started in the US and has taken some years to reach Denmark. Share buybacks in Denmark was almost unknown until the turn of the century but since then it has also become popular here.

Theoretically share buybacks are surrounded by doubt. As such a share buyback do not create any value for the shareholders that cannot be created by dividends. Nevertheless they continue to grow in size compared with dividends, at least in the US. Grullon & Michaely (2002) shows that by 2000 more cash was distributed to shareholders through share buybacks then through dividends. As no first order value is created through a share buyback scholars has tried to come up with explanations as to why share buybacks has become so popular. Most research focus on second order effects such as conveying information to the market or changing the capital structure in order to minimize principle-agent problems.

A few scholars have however taken a different approach.
Brav *et al* (2005) did a survey in which they asked practitioners about their reasons for doing buybacks. In the survey US CFO's stated that an undervalued share price is the single most important factor for doing share buybacks as 75% of the participants in the survey highlight this factor. This fits badly with the theories regarding share buybacks as most scholars assume efficient markets where undervaluation is impossible. This assumption is off course a simplification of the real world and as such the survey by Brav *et al* showed that practitioners had a much more hands on approach than the scholars.

The purpose of this thesis is to investigate if Danish companies are able to take advantage of an undervalued share price when they conduct share buybacks and thus create value for the shareholders. Hereby I implicit assumes that Danish companies conducts share buybacks for the same reasons as stated by the US CFO's in the survey. As no similar survey has been conducted among Danish CFO's so whether Danish companies perform share buybacks for different reasons is not to say.

Why is it of any interest whether the companies are able to create value for the shareholders by taking advantage of an undervalued share price?

When companies distribute cash via dividends they leave the decision on how to invest the cash with the shareholders whereas a share buyback deprives the shareholders of this option. In effect the cash is reinvested in the company at the prevailing share price at the time of the buyback. This ad value to the shareholders if the company is better at assessing their share price than outside investors but the opposite is true if the company is in fact worse. By conducting share buybacks the company takes on the role as an asset manager with only one share in his portfolio. Asset managers are constantly measured on their ability to create value by "beating the market" and as such so should the companies when they take on this role.

This thesis therefore focuses on the actual returns earned by Danish companies on their share buybacks to analyse whether they are good or bad as asset managers. This is off course relevant for investors as it would be had they invested through a real asset manager.

My analysis is split in two sections. The first section focuses on absolute return whereas the second focus on relative return. The absolute return is of interest as this is the return actually earned by the company on the buyback and as such shows whether they are good or bad at taking advantage of an undervalued share price as they claim is the reason for doing the share buyback. This is also the return earned by simple investors who do not hedge their investments.
The relative return is of interest for more advanced investors who hedge their investments against a broader benchmark. The relative return also shows the companies abilities to assess their share price if general macro economic factors such as a financial crisis are left out of the equation.

Furthermore I test different parameters that previous research has shown to have an impact of the return. These parameters are tested to see if any form of screening can be used to enhance the return for investors who wish to invest in companies who conduct share buybacks.

Methodology

In this section I discuss my choice of methodology and what consequences my choices have. As mentioned earlier the purpose of this thesis is twofold. First I want to test if managers are able to exploit an undervalued share price as they state is their main reason for conducting share buybacks. Secondly I wish to test if investors can optimize their investments by investing in share buybacks with certain characteristics. The characteristics I analyse are the market capitalization of the company and the price-to-book ratio. Why these characteristics have been chosen will be discussed in the theory section.

The structure of the section is as follows: First I discuss my delineation which then leads to a review of the different return analysis that will be performed later in the thesis.

Delineation

The setup of this thesis contains a number of delineations. All delineations have been chosen with a balance between quantity and quality in mind. A large quantity of data is wanted as it reduces the statistical error on the return calculations, but on the other hand a larger quantity would have resulted in a lower quality which then would enhance the statistical error. The balance between quantity and quality would be discussed under the individual subparts.

First I have chosen to exclusively focus on share buybacks performed by Danish companies. I have chosen to only focus on Danish companies in order to decrease the size of the database of company announcements. Had foreign companies been included this would have multiplied the number of announcements that needed to be sorted and thus the collection of data would have taken several times more than the 2 months that have been used in this thesis. Furthermore it is possible that the ability to conduct share buybacks with success is a learning process. As the share buyback phenomenon has started at different times in different countries it might blur the overall result. The only exception from this geographical delineation is that Nordea Bank has been included in the sample even though their main listing is on the Stockholm Stock Exchange. Nordea has been included as they are partly Danish and as such can be viewed as a Danish Company. Other companies listed on Copenhagen Stock exchange with dual listings has been excluded as I have classified them as foreign companies based on an individual assessment.

The second delineation is that only share buybacks from the period 2001 to 2010 will be included in the sample. As share buybacks where not common in Denmark before this period there is simply not any data available. There might have been a few buybacks conducted before 2001 but the data would be very limited and scattered over a long period. This data would add very little information to the total sample and it has therefore been left out of this thesis as the workload of sorting the announcement data for previous years don't offset the value added.

My final delineation concerns the type of share buybacks that is included in this thesis.
In general three types of share buybacks exists, each with different sub-types.
A share buyback can be conducted as a auction where the company announces that it will buy back a certain amount of shares at a given date at either a fixed price or at the prices at which the amount of shares tendered by the shareholders matches the amount the company wishes to acquire. Auctions often involve the company paying a higher price than the prevailing market price in order to convince the shareholders to depart with their shares. If the reason for conducting the share buyback is to take advantage of an undervalued share price at least some if not all of the undervaluation will be lost when the company has to pay a premium over the prevailing market price. Hence auctions are not suitable as data if the perceived undervaluation is the focus.
Another type of share buyback is the directed buyback where the company buys shares directly from either a single shareholder or a small group of shareholders. Often these types of buybacks have a different motive than to take advantage of an undervaluation and they are therefore often conducted at prices either above or below the prevailing market price. This makes them unsuitable as data as was the case with the auction-types.
The final type of share buybacks is buybacks which are conducted in the open market where the company buys shares through a broker over a longer time period. This type is the most commonly used and as they are always conducted at the prevailing market price they are very useful as data for this thesis.

Collecting Data

The Danish stock exchange, which is part of Nasdaq OMX has a comprehensive database with all announcements made by companies listed on the stock exchange. These announcements are available on http://www.nasdaqomxnordic.com/news?languageId=1.
Unfortunately the categorisation of the announcements is not 100% correct. In order to make

sure all announcements regarding share buybacks has been properly identified it has been necessary to thoroughly search and examine all announcements in the period this analysis covers. This has led to a database of 1086 unique announcements divided on 25 different companies. The database contains announcements regarding open market buybacks done under the EU directive 2273/2003 known as the safe harbour. This directives outline rules that companies which to conduct open market share buybacks can follow in order to avoid any insider accusations. This directive is very useful for the purpose of this thesis is it in short states that companies are obliged to on weekly basis announce their buybacks on daily aggregate levels. This creates a very accurate database for analysing actual buybacks done as open market operations containing 113 individual buybacks with specific data on precise date of purchase, volume and price. Buybacks done before the introduction of the above mentioned EU directive and buybacks done as non-safe harbour buybacks are added to the database if they meet the following criteria:

- Buyback is done as a open market operation
- Stock market announcement contains information on exact date, volume and price

All other open market buybacks are not considered for this thesis as the lack of data would involve some guessing regarding the actual purchase price which would dilute the overall quality of the data.

Different perspectives – different returns

As mentioned earlier this thesis takes two different perspectives on share buybacks. Different perspectives that also requires different return calculations.

First, share buybacks are analysed from the perspective of the company and simple shareholders – do share buybacks actually create any value or should the excess cash be distributed as dividends instead. This perspective is analysed by absolute returns as these are the actual returns earned by the company and shareholders.
The second perspective is seen from the perspective of advanced investors who have the possibility to either hedge their investment or diversify it such that the market risk is removed and only the company risk remains. In order to analyse this perspective relative returns are calculated.

Most prior studies have chosen to analyse share buybacks by using abnormal holding returns. These returns are calculated such that a normal expected return is stipulated based on the shares past beta to the market. By then comparing the actual realised return with the expected return an abnormal return is calculated. This abnormal return shows if the share has over- or underperformed compared to what was expected. This way of calculating a return is good at showing the effect of a given act but it does not show whether value for the shareholders are created or not. What if the expected return for one year was -20% but the abnormal return turns out to be +10% - has this created any value for the shareholders? The answer must be no! The realised return would be -10% and shareholders would still have lost money. Indeed their loss would be less than expected but if a share drops 10% in one year it cannot be classified as having been undervalued to begin with.

I have therefore chosen a more simple approach in this thesis.

In the following section I describe and discuss the two different return calculations. Common for both calculations however is that they are based on total return data from Datastream. The total return is calculated as follows:

$$RI_t = RI_{t-1} * \frac{P_t + D_t}{P_{t-1}}$$

Where:

RI_t = return index on day t

RI_{t-1} = return index on previous day

P_t = price on ex-date

P_{t-1} = price on previous day

D_t = dividend payment associated with ex-date *t*

By using the total return as calculated above any dividends paid are reinvested. The return on the benchmark used in the relative return calculations is calculated in a similar way, thus the returns are comparable.

Long term vs. short term

When companies perform share buybacks in order to take advantage of an undervalued share price it is of interest to find out why the company believes the share price is undervalued as

the perceived undervaluation could be due to several different reasons. Is it because the company feels that the current share price does not reflect the short term earnings expectations? Or is it because the company feels that the current share price does not reflect the long term strategic opportunities the company has?
In order to analyse the above mentioned reasons both the short term and long term performance of the share buybacks will be analysed.

Throughout this thesis the following period returns will be calculated:

- Period 1: The time from the buydate until the first coming update of the financial statements.
- Period 2: The time from the buydate and 1 year forward
- Period 3: The time from the end of period 2 and 1 year forward
- Period 4: The time from the end of period 3 and 1 year forward
- Period 5: The time from the end of period 4 and 1 year forward
- Period 6: The time from the end of period 5 and 1 year forward

Period 1 and 2 will be included in the short term analysis, whereas period 3,4,5 and 6 is used in the long term analysis.

The return in the period until first coming financial statement, whether it is quarterly, half-year or full year is used as a measure of the ability of companies to assess the share price on short term and to launch the buyback at the right time. This is partly a test of the information value in a share repurchase as new information is supplied to the market through the financial statement and hence the possible undervaluation could be priced out of the market after the announcement. A comparison of the short term and long term performance will also show managers ability to predict their own share price. It should be easier for the company to predict the share price after the first coming financial statement then say 5 years into the future.

As returns will be calculated for different periods it is necessary to define how the return will be presented. For the 1,2,3,4 and 5 years return it is appropriate to use returns on a yearly basis calculated as actual/actual.

But the period until the first coming financial update will vary from buyback to buyback as it depends on how long before the update the buyback is launched. It is easy to see that a

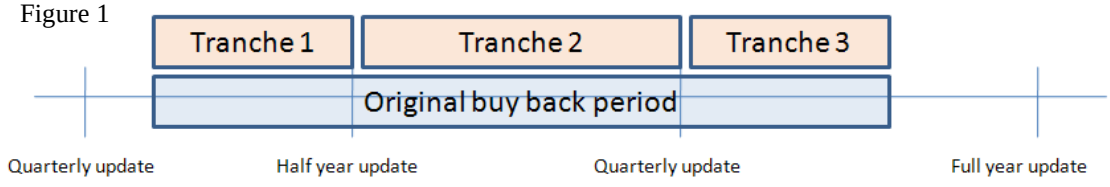
buyback launched immediately after a financial update will run for longer time compared to a buyback launched immediately before a financial update. The first buyback may have a period length of 90 days whereas the latter might only have a period length of 1 day. This off course gives rise to problems if returns are annualized. Annualizing a 1 day return is subject to great statistical error, especially considering that new information is given to the market during this very short period and abnormal price changes are more likely to occur. If returns on the other hand are not homogenized they are not comparable.

The purpose of this paper is not to rank companies abilities to perform share buybacks and as such a direct comparison between the short term returns are not necessary. The short term return will therefore only be used to evaluate the companies timing abilities when they launch buyback programmes. It is therefore appropriate to present the short term returns without converting them.

Dividing the buyback into subparts

The length of an open market repurchase can vary from a few weeks to several years depending on the size of the buyback and the liquidity of the share. As the short term analysis deals with the share price performance until the first coming update of the financial statements it is inconvenient if the share buyback spans such updates. It is therefore necessary to divide the buyback into smaller periods so that each buyback does not contain any quarterly, half year or full year reports.

Figure 1



This is done so it is possible to evaluate management's ability to launch buybacks at the right time. If the share is undervalued as management believes the new information given to the market at the updates of the financial statements could correct this undervaluation and hence the result of my analysis would not show the correct result if buyback periods were allowed to include such updates.

The long term

When calculating the long term absolute return the following needs some consideration:

- Should the buyback be divided into subparts or seen as a whole?
- What is the start date for the return calculation?

Some buybacks span over several years and the share price can therefore move substantial while the buyback takes place. And some buybacks are not completed but simply put to a hold for some reason. As shown earlier managers most often refer to shareholder value when explaining why they perform share buybacks. This requires that management continuously evaluates the current share price during a buyback as the buyback should be stopped if the share price is no longer undervalued. This continuous evaluation is especially critical when the company announces financial statement updates as these events often lead to abnormal changes in the share price. Thus using the same sub periods as in the short term return analysis would be appropriate as the share buyback programme should be reconsidered after each update of the financial statements. This also allows for an analysis of which part of a buyback that creates more shareholder value.

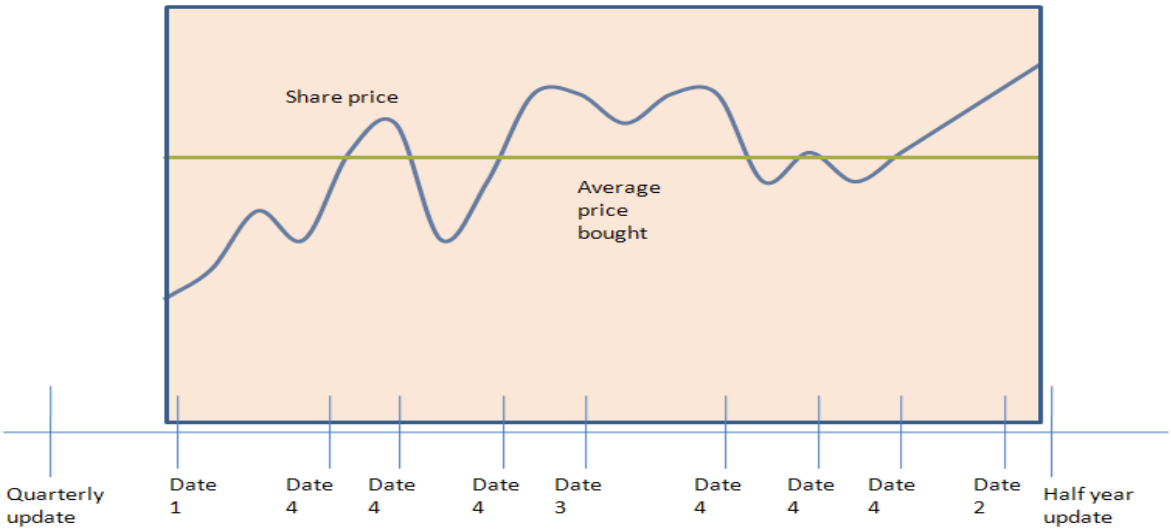
Setting the buy date

Contrary to the short term analysis, it is important to set a date at which the return calculation is started as the long term return will be calculated on a 1,2,3,4 and 5 year basis.

There are several options for setting the buy date.

1. The date the first purchase was done
2. The date the last purchase was done
3. The date halfway between the above mentioned dates
4. The date where the share price best matches the average price at which the shares are bought.

Figure 2



As the above figure shows the fixing of a buy date could potentially influence the final return greatly. Using date 2 (the end date) in the above example as start date gives the buyback a head start as the share is already trading above the purchase price. This will result in the calculated return being too high. The opposite applies if date 1 is used. So in order to start the return calculation without a bias, date 4 is most suitable. As the example shows there are however several dates at which the average purchase price matches the market price. In order to be consistent throughout the paper I have chosen to use the first date 4 after the start date as the buy date.

The use of the average purchase price and the first coming day 4 corresponds to a situation where the shares were bought as a tender offer with a premium of 0%.

Relative returns need a benchmark

As mentioned earlier this thesis takes two different perspectives on share buybacks. When seen from an institutional investor what is interesting is the relative return as these types of investors can remove the markets risk by either diversifying their investments or by hedging it.

In order to calculate a relative return a benchmark is needed and this off course raises some questions as to which benchmark to use as several options exists:

1. Use of a sector benchmark such that companies is compared with other companies in the same sector.
2. Use of a broad benchmark such that companies is compared with the general market.

Choice number 1 is relevant if you want to measure the management of a company against it competitors. By using a sector benchmark the performance of the management is solely focussed on their ability to optimize their business. Management is not measured on whether they have chosen the right industry. This is not suitable for this thesis as industry specific prospects might be management's reason for conducting the share buyback.

Hence a broad benchmark is relevant if the purpose is to measure the management's ability to create value through optimizing their business and by choosing the right industry to be a part of.

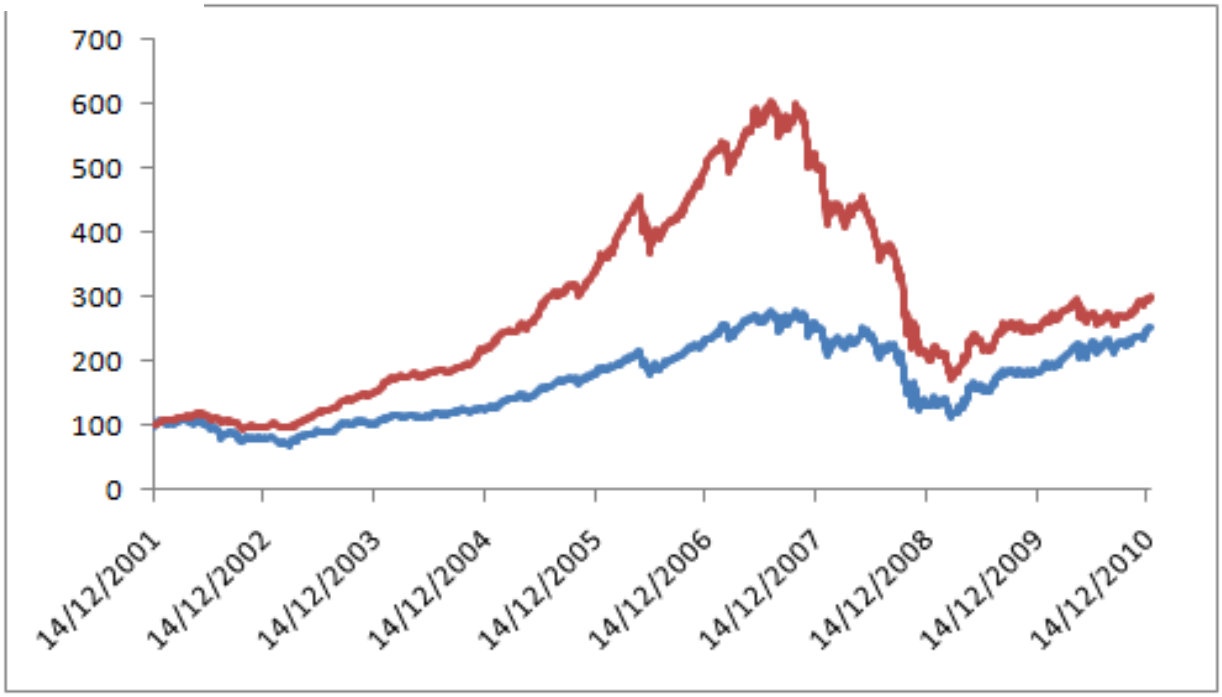
Having chosen a broad benchmark leads to new questions as there are several available benchmarks in Denmark.

- OMX Copenhagen 20
- OMX Copenhagen Benchmark
- OMX Copenhagen Midcap
- OMX Copenhagen Small Cap
- OMX Copenhagen All Shares.

In order to show the potential consequences of choosing one of the above benchmarks diagram 1 below depicts the OMX Copenhagen Benchmark (blue line) and the OMX Copenhagen Small Cap (red line). It is quite easy to see that the choice of benchmark might have great influence on the calculated relative returns. Clearly small size companies outperformed large size companies from 2003 to 2007. The reverse is true from 2007 to 2008.

An analysis of the companies in my sample data shows that 75% of the buybacks are done by companies who are part of the OMX Copenhagen Benchmark and as such this index fits best with my sample data. Thus for calculating relative returns the OMX Copenhagen Benchmark has been chosen as benchmark.

Diagram 1



The following section gives a review of the literature regarding share buybacks.

Theory on Share repurchases.

Before I start my review of the recent literature on share buybacks I start with a short history lecture followed by a geography lecture.

Share buybacks, as so many other aspects of corporate finance, started in the US. After a change of laws in 1982 it became more attractive to companies to do share buybacks and so the phenomenon started gathering pace in 1983. In 2004 a new law forced US companies to announce the actual trades connected to a share buyback so that prices paid and the quantity bought would be made public on quarterly aggregate data. Until then companies should only publish if the board had approved a buyback scheme, In other words they should announce their intentions but not their actual behaviour. This off course made life difficult for scholars who wanted to gain insight on the reasons for and effects of share buybacks. It left the academic community with two choices. Either it could use the announcements of board approvals and then analyse the stock market reaction to these or they could analyse the only data available on actual trades which where announcements of tender offers, Dutch auctions or other types of auctions. Both of the choices had serious flaws. First the board announcement-choice had a serious problem since most of the buyback programs that were approved by the board never were launched. A programme to buy back 10% of the shares

each year was custom at most companies – but few programmes were actually launched and even fewer were completed. Since it was not possible to test the effect of actual buybacks scholars focused on explaining the market reaction to announcements of board approvals. This led to the signal theory which will be explained in details later on.

The other choice scholars had up until 2004 were to analyse the buybacks which were done as tender offers or other types of auctions. The problem with this kind of analysis where two-folded. First the number of buybacks in this category was very small and secondly this type of buybacks usually involved the company paying a large premium in order to get shareholders to tender their shares. The limited numbers of transactions impose a problem as the conclusions drawn from the analysis of tender offers might not be applicable to the rest of the majority of the buybacks which are done as open market operations. Hence the relevance of this path of analysis is small in the overall picture.

Secondly the fact that companies have to pay a premium in tender offers is incompatible with a view on share buybacks as an investment for the company. Why should a company choose to pay a premium of X% in order to buy its shares when it can do so in the open market without having to pay the premium? So using auction data as basis for theories regarding share buybacks seems irrelevant as it is only relevant to a small subset of transactions and it excludes a large part of the possible explanations.

Now, that was the problems with history – now I turn to problems with geography.

As earlier mentioned the share buyback phenomenon out sprang from the US and so most analysis is based on US buybacks. This off course also means that the theories developed are applicable to the US – but what about the rest of the world? Clearly corporate governance setup differs from country to country. Even within the EU there is no uniform corporate governance. Benhamouda & Watson (2010) shows that corporate governance in the US and UK differs in many aspects which has implications for the conclusions drawn on share buybacks.

In the following section I will go through the most important theories which all are based on US data and corporate governance. I will relate each theory to both the history and the geography problems mentioned above.

Modigliani & Miller

Modigliani & Miller stated in 1961 that in perfect capital markets it doesn't matter whether companies pay out cash to its shareholders as dividends or repurchases shares. All information is already priced in the current share price and therefore no new information is passed on to the markets and the share price should not respond to changes in payout policies from the company.

This off course requires a lot of assumptions including efficient capital markets and shareholders paying the same tax rate on dividends and capital gains.

If all assumptions are met companies shouldn't care if they pay out cash as dividends or share repurchases. And correspondingly shareholders shouldn't have preferences for choice of payout method.
This off course only applies if the reason for the cash payout is to distribute excess cash to the shareholders which was exactly what companies according to Modigliani & Miller should do when all NPV-positive projects had been funded.

If the world were indeed as assumed by Modigliani & Miller this paper would stop here as there would be no need to investigate share repurchases any further. They would simply be viewed as a way to return excess cash to shareholders and shareholders would not care if they received the cash as dividends or share repurchases.

The academic world has however shown that the real world is not as simple as put forward by Modigliani & Miller.

Several topics have been investigated vigorously in the recent 30 years. First of all it is shown by Kristensen (2008) that share prices do react to announcements of share repurchases or changes in dividends. Furthermore Grullon & Michaely (2002) shows that the composition of cash payouts from companies has changed markedly over the last decade and finally shareholders in most countries are not taxed evenly on dividends and capital gains. In broad terms research into share repurchases can be divided into two groups:

- Why do companies perform share buybacks from a theoretical point of view
- What is the effect of a share buyback on the stock price

In the following I start with a review of why companies perform share buybacks. This is afterwards complemented with a short review of what effect the share buyback has on the subsequent share price.

Why do companies perform share buybacks?

The question of why companies perform share buybacks can be viewed from two angels. You can either develop theories that explain the share buybacks or you can ask the companies who actually perform buybacks. This off course might end up in two very different results but I'll get back too that later. Let me start with a review of the literature made by scholars who has thought long and hard about why companies perform buybacks.

The academic way

First of all – searching for an answer must be the same as rejecting M&M's proposition as this state that there is no answer. Companies can do whatever they like – it doesn't matter for the shareholders. So when scholars around the world develop theories explaining why share buybacks has become so popular they also reject the simple world of M&M.

Vermaelen (2005) points to four different aspects of share buybacks:

1. It is an investment for the company
2. It is a payout decision
3. It changes the capital structure
4. It changes the ownership of the company

Grullon and Ikenberry (2000) lists five theories/reasons as to why companies perform share repurchases:

1. To signal that the current share price is too low
2. Reduce agency problems (Free Cash Flow by Michael Jensen)
3. Reallocate capital in the stock market
4. Return excess capital to the shareholders
5. Change the capital structure of the company

As I will show in the next section the first 4 reasons listed above does not explain why share buybacks has risen so much the last 20 years. The desired effect could as easily have been achieved by paying out the cash as a dividend. Only if the goal is a change in capital structure does it matter whether the company pays a dividend or repurchases shares. So the reason for

the rise in share buybacks must be found elsewhere but I will return to that after a brief overview of the reasons above.

The signalling hypothesis

The signalling hypothesis claims that share repurchases are done to convey a signal about one of two things.

- They might try to correct the markets interpretation of the known information – i.e. they disagree as to how the market prices their share.
- They might try to signal new information about the future earnings potential.

In both cases the management believes they are better informed than the market about the intrinsic value of the company and sees the current share price as a "good investment".

Signal theory states that in order for a signal to be credible it must also be expensive. If the signal could be sent for free everybody would do it and it would have lost its meaning as it would then be impossible to distinguish "good" signals from "fake" signals. In the case of share buybacks the cost of sending the signal is that the company uses cash to pay for the share repurchase and so lowers the financial flexibility of the company.

In the case where the company tries to convey new information about future earnings by performing a share repurchase they could however have sent the same signal by paying out the cash as a dividend. Research has shown that dividends are sticky and that companies are reluctant to reduce dividends. Hence raising the dividend also conveys a signal that the company believes that future earnings can support the rise in dividends.

If the company on the other hand wants to signal that the current share price does not correctly value the known information then the company cannot convey the same signal by dividends. Here a share buyback is needed as an extra dividend would convey little information about the company view on the current share price. In fact a dividend could be interpreted as a signal that the company believes the current share price is too high and that they do not want to use the cash to buy back shares as they see the current price as a bad investment.

So the signal theory only explains the rise in share repurchases versus dividends if the signal is about correcting the valuation of already known information.

The Free Cash Flow hypothesis

Michael Jensen put forward his Free Cash Flow hypothesis in 1986. The hypothesis is based on agency theory where the principal (shareholder) and agent (manager) has different objectives. This leads to the manager not taking the best decision from a shareholder point of view. He might engage in empire building or award himself perks such as corporate jets or penthouse apartments. According to Jensen this can be avoided by minimizing the free cash flow available to the manager. The free cash flow is defined as the cash left when all NPV positive projects have been funded. The free cash flow can be reduces in a lot of ways. Taking on new debt is one way as the interest reduces the free cash flow. Debt is very popular with private equity companies where it is used as a discipline tools since it commits management to a series of future payouts unlike dividends or share repurchases. But a company who has a free cash flow do not need more debt – it has already funded all NPV positive projects according to the definition of free cash flow. So taking on more debt to reduce the free cash flow must result in a payout in the form of either a dividend or a share repurchase. Hence the capital structure is changed. The other option is to just pay out the free cash flow directly to the shareholders as a dividend or share buyback instead of obtaining new debt.

But as Vermaelen (2005) argues – who forces the management to pay out the excess cash? If the management is prone to the agency problem they will not voluntarily pay out any cash as they would rather use it to overinvest in NPV negative projects. So the free cash flow hypothesis requires a strong board or a strong majority investor who is able to force management to pay out excess cash. Otherwise bad managers will invest the cash and only good managers will pay out the cash to shareholders.

As to the free cash flow hypothesis the managers of US companies usually has much more power then managers of European companies. This is due to the fact that managers in US are allowed to be part of the board and often even chairman of the board and furthermore shareholders are usually very disperse in the US where no shareholder owns more than 5% whereas Europe is characterized by large shareholders who often are majority shareholders. And managers are in many European countries not allowed to be part of the board. This leads to less powerful managers in Europe so agency problems due to free cash flow might be easier resolved in Europe due to a strong board so a share buyback due to free cash flow might be more likely in Europe than in the US.

So none of the two major hypotheses about share repurchases can explain why share repurchases has become so popular in contrast to dividends. They might explain the total level of payout to shareholders but not the composition of the payout.

Reallocation of capital

This theory suggests that companies who perform share buybacks does so because they have reach a stage in their lifecycle where they shrink there asset base and thus returns cash to shareholders who then invests this cash in areas of the economy with growth potential. This idea stems from the dynamics of the capital markets which primary task is to efficiently allocate the surplus capital to those who need it for profitable projects. But giving capital back to the shareholders could as easily been done by giving an extra dividend.

So like the free cash flow theory this could explain the total amount of payout but it does not explain why share repurchases has become so popular at the expense of dividends.

Returning excess cash to the shareholders

This argument has a lot in common with both the free cash flow hypothesis and the reallocation of capital-theory as it is about deploying excess cash to the shareholders. The company has funded all its NPV-positive projects and still has cash left. Only difference from the free cash flow hypothesis is that management chooses to do so voluntarily. But again this only explains the total payout, not the composition.

Changing the capital structure.

Off course a share buyback changes the capital structure – in principal all transactions do if you view cash as negative debt. But if you want to raise the debt-to-equity ratio, buying back shares is one way to do it. As Grullon & Ikenberry (2000) argues companies would usually use tender offers to make large changes to the capital structure as the amount of shares bought in tender offers or dutch auctions are typically larger than the amount of shares bought in an open market buyback. Furthermore a tender offer/auction is quicker to execute than an open market buyback. So changes to capital structure are more likely to be the reason for tender offers /auctions than open market buybacks which is the basis for this thesis.

So of the 5 reasons stated above only four are applicable to open market buybacks. Of these only one can partly explain the rise in share repurchases witnessed the last 20 years. So either there must be some other reason why share buybacks are preferred to dividends or else the

signalling theory regarding the market not valuing the know information correctly is the correct reason for the surge in share buybacks.

It is now time to leave the world of scholars and enter the world of practitioners.

Surveys of CFO's

Instead of taking an academic approach to why companies perform share buybacks which might become rather theoretical why not ask the companies themselves. That is exactly what several studies have done. In the following section I look at two of these surveys and compare their results to the theoretical basis that has been developed.

Reasons for share buybacks

The first survey is by Brava *et al* (2003) who investigated US companies view on both the general payout policy and the composition of the payout. As with most of the research done on share buybacks this is based on US material. It is therefore necessary to consider if their findings are transferrable to the European and in particular the Danish market. I will in the following comment if thoughts on the transferability are necessary.

They find that dividends are still sticky as first introduced by Litner in 1956. Sticky dividends mean that companies are reluctant to make changes to dividends which cannot be supported in the future. Companies therefore sees share repurchases as a more flexible way to payout excess cash as share repurchases are not as sticky as dividends and can more easily be changed from year to year. It is worth noting that US firms usually pays dividends on a quarterly basis whereas Danish companies pays the regular dividend on a yearly basis. What effect might this have for how sticky dividends are? One way to look at it is to say that US companies pay dividends as an interim payment whereas Danish companies pay dividends when the result for the year has been confirmed. Danish dividends are based on actual earnings whereas US dividends are based on expected earnings. Off course this leads to a higher information value in the US dividends and US firms are thus more reluctant to cut dividends as it sends a negative signal. All in all Danish dividends ought to be less sticky than US.

Good investment

When going more in detail with share repurchases they find that companies view share repurchases as an investment and that they prefer share repurchases to dividends if they feel their share is undervalued or a good buy. This is the most popular answer in the whole survey

as 86,6% of the companies reply that they buy back shares when it is good value. They explicitly find however, that managers do not buy back undervalued shares to signal that the shares are undervalued – they simply do so because they see it as a good investment. I will later come back to the rationale behind seeing your own stock as a god investment. There is no reason to believe that Danish managers would view buybacks differently on this point.

Enhances EPS

Another very important reason stated by the companies is that share buybacks enhance Earnings per Share. Managers are especially aware of the impact stock option programmes have on diluted EPS. This dilution is refuted by the share repurchases if the shares are used in the stock option programme. The EPS enhancement from a buyback will be dealt with in more details later. In general stock options are more used in the US than in Denmark hence management should pay less attention to the dilution effect. Danish managers might still be focused on EPS however.

Comparison to academic theories.

Brava *et al* (2003) continues their survey by examining how managers view the different theories put forth by academics. In particular they try to link their findings to the theories of signalling, agency problems of free cash flow and taxes. They find no support for any of these theories.

Taxes

Companies are aware of the tax disadvantage dividends have to share repurchases, yet they state that tax considerations are not important to the payout policy.

Agency problems and free cash flow

Managers believe that neither dividends nor share buybacks are used as a disciplinary tool to prevent empire building. 88% of the managers share this view regarding dividends and 79% share it regarding share repurchases. It is however difficult to interpret the reliability of these answers. The idea of Jensen's Free Cash Flow hypothesis is that good managers impose these restrictions on themselves whereas bad managers need an exogenous stimuli (from the principal of principal/agent theory) to force him to do so. The question is then if bad managers are willing to reply honestly to a question that potentially reveals him as a bad manager?

Furthermore there might be more payouts in Denmark due to the free cash flow hypothesis than in the US. This is due to differences in the governance system. Managers typically have less power over the board of directors in Denmark as they are not allowed to be part of the board. Furthermore shareholdings are more concentrated in Denmark with many companies having large shareholders whereas the shareholding in the US is more dispersed. These two factors lead to the principal having relative more power than the agent in Denmark as opposed to the US which again might lead to more payouts due to agency problems being imposed on Danish managers.

Signalling theories

Overall managers agree that both dividends and share repurchases convey information to the market. They do however at the same time say that the signal is not the primary reason for neither paying dividends nor performing share repurchases. So even though signalling theories are applicable to share repurchases they are not the reason why they take place.

So overall Brava *et al* (2003) rejects the notion that share repurchases are done in order to optimize shareholders tax, reduce the free cash flow or signal that the share price is undervalued. Instead they find that share repurchases are used when buying the share is an good investment (undervalued) or to enhance EPS. There are several issues concerning the EPS-enhancement angel which I will return to later.

In another survey conducted by Baker, Powell & Veit (2003) companies confirm that their main reason for making open market share repurchases is to take advantage of an undervalued share price. This survey differs from Brava *et al* (2003) as they only analyse open market share buybacks. Hence the overall payout policy is not considered in this survey. When going more in detail they find that especially three reasons were very important for share buybacks. Most important was to create shareholder value, second was to buy share cheap and third was to raise EPS.

So both survey paints a picture that companies perform share repurchases in order to either take advantage of an undervalued share price or to increase EPS. In the next section I will go more in detail with these two arguments in order to show how a share buyback affects them.

Increasing EPS through share buybacks

There is little doubt that theoretically a share repurchases increases both EPS and the share price. As Oded & Michel (2008) shows both EPS and share price rises, compared to the

situation where the company pays out the cash as dividends or retains the cash in the company. They also show however that the total wealth to the share holders remains the same whether the company retains cash or pay it out as dividend or share buybacks. The rise in EPS and share price is offset by each shareholder holding fewer shares. This off course implies that all shareholders sell an equal amount of shares during the share buyback and that the relative ownership among the shareholders is unchanged. This might theoretical be possible in a tender offer or Dutch auction but in an open market buyback it is unlikely that the relative ownership is intact after the share repurchase.

Shareholders who do not sell shares during the share buyback increases their relative ownership as they hold the same number of shares out of a smaller total. But the cost is that they do not receive any cash, neither as dividend nor from selling of shares. Their total wealth is therefore unchanged under different payout policies. So the effect is the same as if they had reinvested their dividends in shares of the company. So the increased EPS and share price is not a sign of improved earnings, rather it is a sign of fewer people eating the same cake and thus getting larger slides.

So why is increasing the EPS important? Two reasons seem plausible. First, simple investors might see a continues increase in EPS as a sign that the company is earning more money and that management is doing a good job. Secondly, the management's option programme might be based upon a target for EPS. It is however not part of this thesis to investigate which of these has any hold in reality.

How to create shareholder value through share buybacks

As just mentioned the payout policy does not change the total wealth of the shareholder. So why do so many managers use shareholder value as a explanation for share repurchases? In order to show how share repurchases can create shareholder value I expand a numerical example used by Oded & Michel (2008). As mentioned above a share repurchase does not create value for the individual shareholders assuming that all shareholders sell an equal amount of shares and thus retains the relative ownership ratio. But what if some shareholders do not participate in the share buyback and thus increase their relative ownership? In the following example I use a company which has assets of 10 million and creates a surplus each year of 1 million which is used for share repurchases. As table 1 below shows the non-selling shareholder 2's wealth increases more than selling shareholder 1. This is due to the fact that

shareholder 2 retains 100% invested in risky assets (shares) which has a higher return, whereas shareholder 1's share of risky assets is gradually reduced due to the buybacks. So shareholder 2's superior return is simply due the fact that shareholder 1 has reduced his risk.

Table 2 show a situation where the stock market undervalues the shares of the company in year 1 which is highlighted in red. As the example show the company are able to buy back more shares from shareholder 1 since the share price is lower than in table 1. In year 2 the share price has returned to its fair value and the total shareholder value is unchanged compared to table 1. But the wealth distribution between shareholder 1 and shareholder 2 has changed. Shareholder 2's wealth is now larger than in example 1 even though his amount of risky assets has not changed. There has in other words been a wealth transfer from shareholder 1 to shareholder 2 due to the fact that shareholder 1 sells his shares to the company at too low a price. Table 3 show the opposite situation where the company share price is overvalued in year 1. This creates a wealth transfer from shareholder 2 to shareholder 1 as shareholder 1 is able to sell his shares to the company at too high a price. So the company is only able to create shareholder value for the non-selling shareholders if they are able to repurchase their shares at an undervalued price. Otherwise they might risk creating value for the selling shareholders who is not among the continuing shareholders and thus the company's interest.

Table 1

	Year	0	1	2	3	4	5
	Value	1000	1000	1000	1000	1000	1000
	Earning	100	100	100	100	100	100
	nr shares	100	90.9	82.6	75.1	68.3	62.1
	EPS		1.00	1.10	1.21	1.33	1.46
	stock price	10.00	11.00	12.10	13.32	14.65	16.11
	Market value	1000	1000	1000	1000	1000	1000
	Book to market		1.00	1.00	1.00	1.00	1.00
	Accumulated value of share rep.		100	205	315	431	553
	Total shareholder wealth		1100	1205	1315	1431	1553
Shareholder 1	Number of shares	50	40.9	32.6	25.1	18.3	12.1
	Cash recieved	0.00	100.11	100.44	99.88	99.60	99.85
	Acc. Cash plus interest	0.00	100.11	205.56	315.71	431.10	552.51
	Value of shares	500.00	449.94	394.50	334.26	268.04	194.88
	Total wealth	500.00	550.06	600.06	649.97	699.14	747.38
	% in risky assets (shares)	100.00%	81.80%	65.74%	51.43%	38.34%	26.07%
Shareholder 2	Number of shares	50.00	50.00	50.00	50.00	50.00	50.00
	Cash recieved	0.00	0.00	0.00	0.00	0.00	0.00
	Value of shares	500.00	550.06	605.06	665.86	732.36	805.27
	Total wealth	500.00	550.06	605.06	665.86	732.36	805.27
	% in risky assets (shares)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	Difference between shareholders	0.00	0.00	5.01	15.89	33.22	57.89

Table 2

	Year	0	1	2	3	4	5
	Value	1000	1000	1000	1000	1000	1000
	Earning	100	100	100	100	100	100
	nr shares	100.0	90.0	81.8	74.4	67.6	61.5
	EPS		1.00	1.11	1.22	1.34	1.48
	stock price	10.00	10.00	12.22	13.44	14.79	16.27
	Market value	1000	900	1000	1000	1000	1000
	Book to market		0.90	1.00	1.00	1.00	1.00
	Acc. Value of share rep.		100	205	315	431	553
	Total shareholder wealth		1000	1205	1315	1431	1553
Shareholder 1	Number of shares	50.00	40.00	31.82	24.38	17.62	11.47
	Cash recieved	0.00	100.00	100.00	100.00	100.00	100.00
	Acc. Cash plus interest	0.00	100.00	205.00	315.25	431.01	552.56
	Value of shares	500.00	400.00	388.89	327.78	260.56	186.61
	Total wealth	500.00	500.00	593.89	643.03	691.57	739.17
	% in risky assets (shares)	100.00%	80.00%	65.48%	50.97%	37.68%	25.25%
Shareholder 2	Number of shares	50.00	50.00	50.00	50.00	50.00	50.00
	Cash recieved	0.00	0.00	0.00	0.00	0.00	0.00
	Value of shares	500.00	500.00	611.11	672.22	739.44	813.39
	Total wealth	500.00	500.00	611.11	672.22	739.44	813.39
	% in risky assets (shares)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	Difference between shareholders	0.00	0.00	17.22	29.19	47.88	74.21

Table 3

	Year	0	1	2	3	4	5
	Value	1000	1000	1000	1000	1000	1000
	Earning	100	100	100	100	100	100
	nr shares	100.0	91.7	83.3	75.8	68.9	62.6
	EPS		1.00	1.09	1.20	1.32	1.45
	stock price	10.00	12.00	12.00	13.20	14.52	15.97
	Market value	1000	1100	1000	1000	1000	1000
	Book to market		1.10	1.00	1.00	1.00	1.00
	Acc. Value of share rep.		100	205	315	431	553
	Total shareholder wealth		1200	1205	1315	1431	1553
Shareholder 1	Number of shares	50.00	41.67	33.33	25.76	18.87	12.61
	Cash recieved	0.00	100.00	100.00	100.00	100.00	100.00
	Acc. Cash plus interest	0.00	100.00	205.00	315.25	431.01	552.56
	Value of shares	500.00	500.00	400.00	340.00	274.00	201.40
	Total wealth	500.00	600.00	605.00	655.25	705.01	753.96
	% in risky assets (shares)	100.00%	83.33%	66.12%	51.89%	38.86%	26.71%
Shareholder 2	Number of shares	50.00	50.00	50.00	50.00	50.00	50.00
	Cash recieved	0.00	0.00	0.00	0.00	0.00	0.00
	Value of shares	500.00	600.00	600.00	660.00	726.00	798.60
	Total wealth	500.00	600.00	600.00	660.00	726.00	798.60
	% in risky assets (shares)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	Difference between shareholders	0.00	0.00	-5.00	4.75	20.99	44.64

This example highlights the fact that share repurchases are not substitutes for dividends, as the company needs to take an active stand on its current share price as they otherwise risk ending up rewarding the shareholder who sold their shares. Dividends however treats all shareholder equal and thus does not create any wealth transfers.

Factors influencing to return

Earlier studies such as Ikenberry, Lakonishok & Vermaelen (2000) show that especially two factors might influence the return on share buybacks.

Market size as measured by the market capitalization is shown to have a negative correlation with the realised return. This is supposedly due to the fact that smaller companies are less analyzed by the major investors and hence the chance of an undervalued share price is larger.

The Price-to-book ratio should also have some correlation with the expected return according to Ikenberry, Lakonishok & Vermaelen (2000). The Price-to-Book ratio measures the market value against the book value of the assets. A low Price-to-book ratio can be due to several reasons.

First the market might expect future earnings to drop and hence price this into the current share price or it might be due to a true undervaluation of the share price. Price-to-book ratios differ greatly from industry to industry as they are very dependent on the need for capital. Some industries such as the oil-industry have very high Price-to-book ratios as a lot of investments in exploration equipment and pipe lines are needed in order to generate a cash flow, whereas industries such as the advertising industry is much more reliant on human capital and as such need much less physical assets to produce a cash flow. So a low price-to-book ratio does not necessarily mean that a share is undervalued. It could simply reflect that the company needs fewer assets to produce the cash flow needed. A Price-to-book ratio of below 1 is however generally seen as a sign of either undervaluation or a company in distress as the share market prices the total company below what its assets is worth. None of the companies in my sample had a Price-to-book ratio below 1 at the time of the start of the buyback.

I will however test these two factors in my analysis as previous studies have shown that they seem to have some relevance.

The absolute return analysis

In the following section I turn to my analysis of the absolute return generated by the buybacks in my sample. As mentioned earlier the absolute return is of interest as this is the return the company actually earns on the buyback as the buyback is done without any hedging. It can also be compared to the return earn by a simple investor who do not hedge his or her investment. The absolute return is off course greatly influenced by the general development in the economy and stock market. Never the less it serves as a good indicator of whether the companies are good at evaluating their current stock price and the future development of it.

One could argue that it is unfair to judge a company's ability to evaluate their own share price by absolute returns as these are influenced by external factors which the company do not control. The financial crisis is a good example of an exogenous factor that had great influence on the absolute return. This is however the risk that the company willingly passes on to the shareholders when they conduct share buybacks instead of dividends and it should therefore also be included in the assessment of the companies. Had the company paid out the cash as dividends the shareholders could have chosen themselves how to invest the cash.

Introduction to the data sample

Before I turn to the actual analysis, a general introduction to the sample data is relevant.

Table 4

	Financial update	1 year	2 years	3 years	4 years	5 years
Total numbers of buybacks	113	99	93	75	49	36
Number of companies	25	23	22	20	17	15

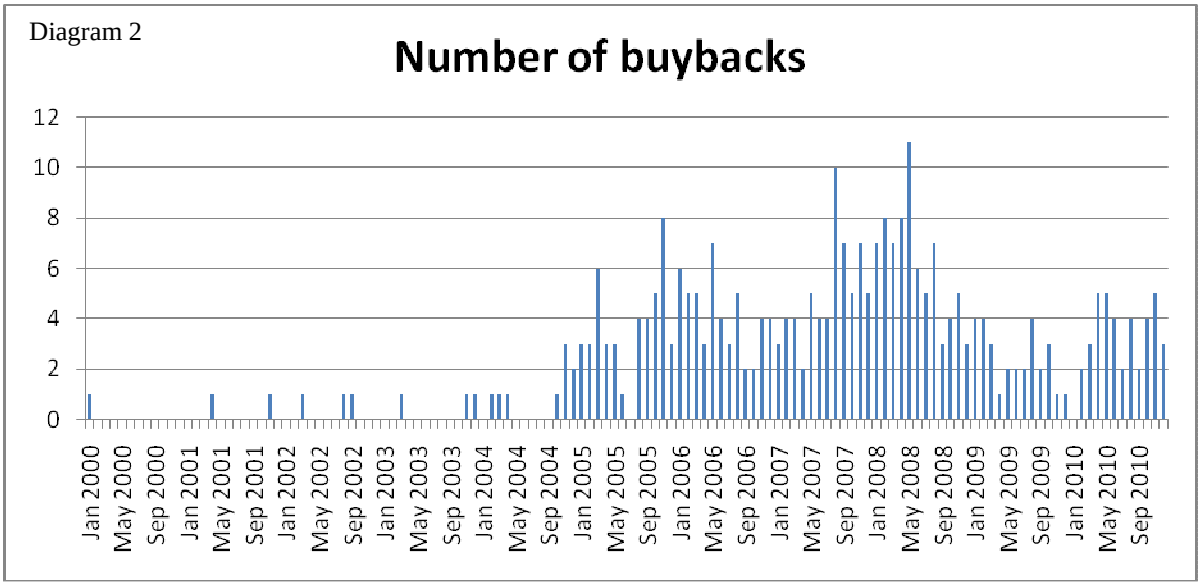
My data consists of a total of 71 buybacks done by Danish companies in the period 2000 – 2010. One Swedish company has been added namely Nordea as they are dual listed in both Stockholm and Copenhagen and thus can be viewed as a partly Danish company. The 113 buybacks has been conducted by 25 different companies. The number of buybacks conducted by a company ranges between 1 and 12. As mentioned earlier I have chosen to split buybacks which spans over an update of the financial statements into several parts such that each buyback does not include an update of the financial statements. This has enhanced the

number of buybacks to a total of 113. As table 4 above shows, the number of data is reduced when the longer term is analysed. This is due to the fact that it is not possible to measure the longer return on buybacks conducted late in the sample period. This means that the 5 year analysis only contains buybacks which was conducted and finished before 31/12-2005. Likewise the 4 year analysis only contains buybacks which was finished before 31/12-2006 and so on.

Diagram 2 below show how the buybacks in my sample has been conducted during the sample period. As it is shown the buyback activity is concentrated from 2005 and forward.

Two things are worth noting regarding this bias in activity.
First, the reason for the bias can be due to an improvement in the quality of my data. The "safe harbour" directive introduced in 2003 greatly improved the quality of the data that companies should provide when performing buybacks such that trading dates, amounts and prices should be published. Before 2003 companies should only publish their total holdings of own shares when their passed certain limits and it was voluntarily to publish trading prices. This has meant that a lot of the buybacks conducted before the introduction of the "safe harbour" directive was useless for the purpose of this thesis.
Secondly buybacks was not a common phenomenon in Denmark around the millennium and this off course also adds to the bias of the data.

Diagram 2

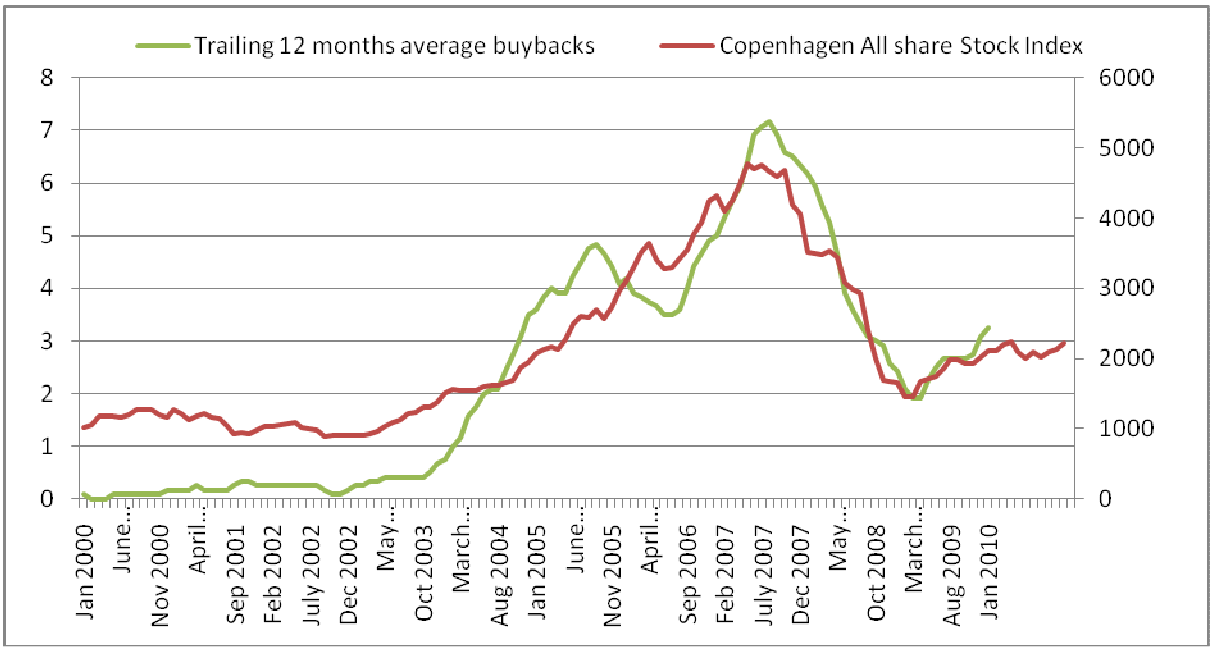


When conducting an absolute return analysis the bias of the sample data might off course have great influence on the results. It is therefore of interest to compare the buyback activity

with the development in the stock market in order to gain a overview of what the results might show.

Diagram 3 below shows the development in the Copenhagen All Share stock index compared to the number of buybacks performed. The number of buybacks is measured as an average of the past 12 months and this has then been advanced 12 months. The fit is striking.

Diagram 3



Two observations can be drawn from this:
First, it suggests that companies perform buybacks based on the current stock price but with a 12 month lag as it takes some time to setup and begin the buyback.
Secondly, it also suggests that companies continue their buybacks once they have started them without taking the development in the economy into consideration.

Most of my sample data falls in the period 2005-2010 and as the diagram shows this period has been characterised by an extreme volatility due to the financial crisis. This leads me to expect great variance in my results as the timing of the buyback will have great influence on the return earned.

Is it then fair to make any sort of conclusions as to whether companies are good or bad at performing share buybacks when the conclusion will be greatly influenced by exogenous forces such as a financial crisis?

I believe so – when companies chose buybacks over dividends in their payout policy they expose the shareholders towards these risk and thus their results should be analysed and judged based on these risks. If companies are no better than their investors in predicting the future share price companies should not conduct share buybacks but leave it to the shareholders to take a view on the future development of the share price. Hence my conclusions in the following section will not be biased because of the financial crisis.

The Total Absolute Return

My analysis starts with a presentation of the aggregate results and then moves on to go more in depth.

Returns can be presented in two ways – either as a year-to-year return or as a total return. The total return is off course accumulated year-to-year returns but for the purpose of showing the actual return earned on the share buybacks the total return is most relevant. Hence I start my analysis by presenting the total returns in table 5 below.

The total return has been calculated as the percentage difference between the total return value from the buydate (see discussion in the methodology section for definition) and the end date. This way any dividends paid during the period are included in the return. Period 1 is the period up until the first update of the financial statement and. Period 2 corresponds to 1 year, period 3 corresponds to 2 years and so forth. This notation will be used throughout the whole thesis.

Table 5

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Average total return	0.6%	2.8%	11.4%	9.7%	20.6%	55.2%
Std. Dev	0.1117	0.3794	0.6282	0.8424	1.1558	1.1802
Median total return	1.4%	-1.5%	-0.8%	-7.8%	-21.6%	11.8%
Minimum total return	-40.0%	-80.7%	-88.2%	-91.5%	-84.7%	-78.5%
Maximum total return	28.8%	104.9%	181.4%	316.7%	492.3%	417.2%

As discussed in the introduction to my data sample it is not possible to directly compare the results as the underlying data is different for the different periods. For instance all buybacks are represented in period 1 but only 36 buybacks are represented in period 6. This means that a large part of the buybacks in period 1,2 and 3 has been conducted from 2006 to 2008 and thus they are greatly influenced by the financial crisis. On the other hand the financial crisis also influences the returns in period 4,5 and 6 as most of the buybacks in these periods were

conducted in 2005 and 2006 and thus their 3,4 and 5 year returns are also influenced by the market development in 2008 and 2009.

But even though the financial crisis, which more than halved the value of the Copenhagen All Share stock index, influence the results all periods show a positive return. The data does however show great variance as the minimum and maximum returns in each category shows.

For instance the 1 year returns vary from -80,7% to +104,94%. This makes it very difficult to conclude anything about the companies ability to time the buybacks and their capability of judging whether their share is under- or overvalued.

However, the median return is more relevant than average. This is due to the fact that returns are bias upwards as negative returns are limited to -100% whereas positive returns are unlimited. See for instance the maximum returns for period 4,5 and 6 which are between 300% and 500% which off course raises the average return markedly. Using the median instead of the average changes the picture since 4 out of 6 period-returns are now negative. Or put it another way – more than half of the buybacks had a negative return at a 1,2,3 and 4 years horizon.

But how does this fit with the idea that companies conducts share buybacks in order to take advantage of an undervalued share price? Not very well. It seriously doubts the idea that the shares were actually undervalued. The data does point in the direction that at least some of the companies did not do the shareholders a favour by distributing the excess cash through a share buyback instead of as dividends. Just look at the minimum returns generated. A return of -80,7% in 1 year (period 2) does not witness of great value creation for the shareholders – at least not for the shareholders who did not sell their shares. It actually tells a story of great value destruction for the shareholders. On the other hand one company managed to earn an astonishing 492% return in 4 years corresponding to 56% a year. This clearly created value for the shareholders.

But in general it is too early to conclude anything just based on aggregate data. Hence a more thorough analysis is needed.

Correcting for comparison

If the returns from different periods are uncorrelated then table above shows a clear picture. But if returns are instead correlated due to companies being either good or bad at share

buybacks then some correction to the aggregate data is needed. In table 5 above all data was used which meant that the data sample varied in size in the different periods. In order to avoid this, the data from table 5 has been corrected in table 6 below. A portfolio consisting of the 36 buybacks in the period 6 sample are created and the returns for the other periods are calculated on this portfolio. This means that returns are now comparable across periods. Off course the returns are still influenced by the financial crisis but as discussed above this will not affect my conclusions.

Table 6

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Average total return	4.1%	29.0%	47.4%	35.3%	35.4%	55.2%
Std. Dev	0.0941	0.2741	0.6360	1.0514	1.2802	1.1802
Median total return	2.1%	27.1%	39.6%	-2.5%	-9.2%	11.8%
Minimum total return	-13.4%	-23.9%	-72.3%	-87.4%	-80.4%	-78.5%
Maximum total return	28.8%	104.9%	181.4%	316.7%	492.3%	417.2%

The first thing worth noting is that all returns have increased except 5 years as it is the same underlying sample. By using the 5 years sample as a portfolio for all returns all buybacks conducted after 31/12-2005 has been left out of the calculation. As a large part of the buybacks in the total sample was conducted during the financial crisis these buybacks will likely pull down the average return so leaving these out off course increases the average returns. Period 4 and 5 might still be influenced by the financial crises as a buyback conducted in for instance 2004 will have it 4 year total return influenced by the development in 2005, 2006, 2007 and 2008. This might explain the drop in total return seen from period 3 to 4 where the median return drops from +39,6% to -2,5%. Period 1,2 and 3 should however not be influenced by the financial crisis.

Leaving the financial crisis out of my conclusions it seems that most buybacks creates value in the first two years as the median return was 27,1% for period 2 and 39,6% for period 3.

This point in the direction that when companies conduct share buybacks the perceived undervaluation is based on current or short term earnings expectations as opposed to more strategic long term factors.

Off course the returns calculated are very dependent on the development in the general economy (read the financial crisis). The data in the sample used to calculate the above returns has an overweight of buybacks completed during 2005 as this is the time with most activity

as shown in diagram 2. This mean that the 3,4 and 5 years returns also has an overweight of returns earned in 2008-2010 which fits perfectly with the financial crisis. So if this analysis would be repeated some years from now the results might be quite different. This does however not change the fact that these returns are the actual returns realized by the companies who performed buybacks in this period and thus also the returns realized by the simple shareholders with no hedging possibilities.

Seen in that light a total return in period 6 of 11,8% corresponds to a yearly return of 2,26%. This is by no mean impressive and it does not show any signs of value creation for the shareholders. In fact most shareholders could probably have earned the same return in the money market had the companies distributed the cash as dividends instead of through share buybacks.

One final point should be noted. The average and median returns can be interpreted as follows:

- The average returns calculated above would be the return an investor would earn had he invested in all the companies who conducts share buybacks. As these are in general higher than the median it shows that even though there might be serious doubt as to whether the companies on average create value for the shareholders it might still be a very good investment. This is due to the fact that some companies earn such high returns that it pulls up the overall result.
- The median returns calculated shows something about the companies general ability to assess their own share price.

In order to further analyse the aggregate data I turn to an analysis of first the timing abilities of the companies, and secondly an assessment analysis. The analysis of the timing abilities hopefully casts some light on whether companies are good at judging their own share price on short term. Are they able to launch the buyback at the right time? Whereas the assessment analysis is more about the long term returns earned by the share buybacks. This split is interesting as it contribute to the general discussion of the perceived undervaluation – is it short term or long term?

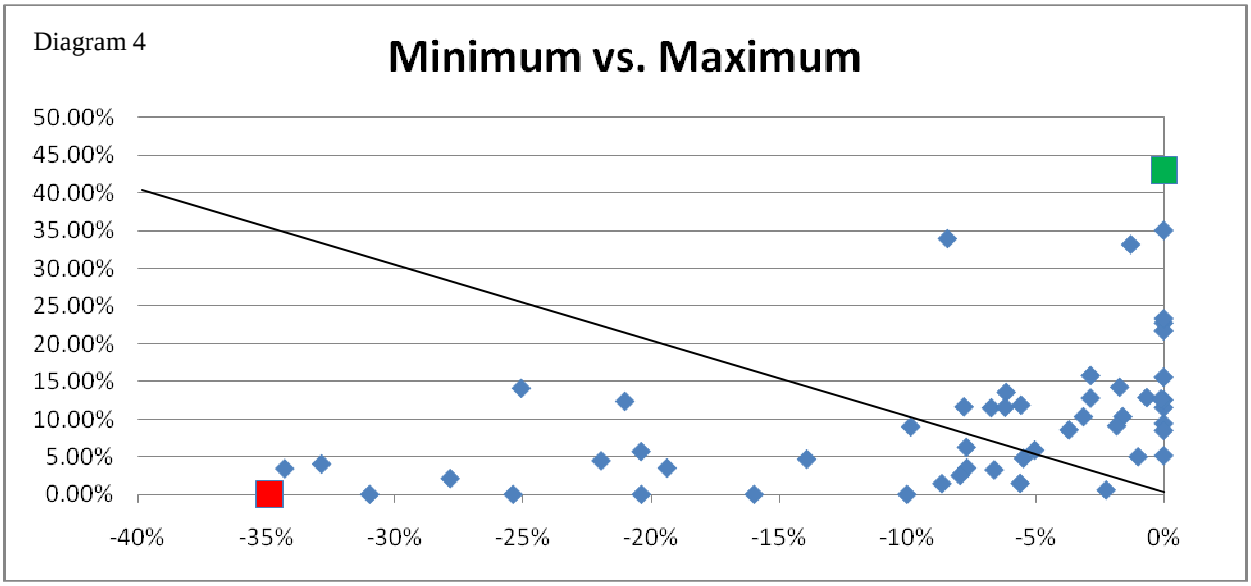
Timing capabilities

In order to further analyse the companies ability to start share buybacks at the right time, an analysis of their timing capability is developed. In this section I focus on returns in period 1 in order to see if companies continuously perform either good or bad. This is interesting as it will cast some light to the question of whether the performance is random or in fact a result of the companies abilities.

The first analysis regarding the timing ability involves comparing the first price paid with the lowest and highest price paid during a buyback. This way it is possible to get a graphical picture of the companies ability to assess their short term share price.

The x-axis in diagram 4 below shows the difference between the start price and the absolute minimum price paid during each buyback. The y-axis depicts the difference between the start price and the maximum price paid. The diagonal line depicts a situation where the price changes are equally big. So observations above the diagonal line had more upside than downside during the buyback whereas the opposite is true for observations below the diagonal line. A count shows that 24 observations are below the line and 28 observations are above. So a fairly even distribution.

Diagram 4



An intuitive interpretation of the diagram is that the more to the upper right corner the better. Observations to the right saw less downside during the buybacks and observations in the upper half saw more upside.

As it can be seen the difference varies greatly, which might be due to a general volatility such as the one caused by the financial crisis. It does however show that share price varies a lot during a buyback. The point marked by a green square shows that during one specific buyback the share price rose almost 45% - and still the company bought shares. Is this an indication that the company still found value in buying the share even though it had gone up by almost 45%? And does this also mean that the company thought that its share price at the beginning was underpriced by as much as 45%? Probably not – one possible answer could be that the share price rose during the buyback and that the high buy prices recorded might have been in the end of the buyback where the company has almost completed the announced amount of shares and therefore continues to complete the buyback even though the price has risen sharply.

Nevertheless most of the observations fall in the range of up to approximately 20%. This can be seen as a good indication of the size of the perceived undervaluation at the beginning of the buyback.

Two more important things can be deducted from the diagram:
First, all observations which fall on the y-axis shows buybacks where the start price paid was also the lowest price paid during the buyback. In other words – the timing abilities of the management seems perfect.

But the diagram also shows that in many cases the share price falls dramatically during the buyback. The red square indicates that a company was able to buy shares at a price which was 35% lower compared to the start of the buyback. In fact all observations which fall on the x-axis in the diagram show buybacks where the start price was also the highest price paid during the buyback! This cannot be classified as good timing. In fact it must be classified as very poor timing abilities by the management.

In the following analysis companies whith a minimum (the x-axis) of less then -1% will be classified as companies with good timing abilities and companies with a maximum (the y-axis) of less then 1% will be classified as companies with bad timing abillities.

Table 7

	Overall	Number of companies	Repeated	Most hits
Good timing	14	8	4	3
Bad timing	8	5	1	4

8 companies show good timing abilities whereas 5 companies show bad timing abilities. Of the 8 good companies 4 shows good timing abillities more then one time – in fact two companies times their buybacks perfectly 3 times. The fact that half of the companies with good timing show it more than once tells that it is no coincidence.

Of the 5 companies with bad timing one company times its buybacks the imperfection 4 times! This can be no coincidence either – the timing abilities of this company is realy bad.

Interestingly two companies appear in both the good timing and bad timing category. None of them are however among the repeaters. So a single hit in either the good or bad category is no guarantee that the company actually possesses or are missing the ability – it might just be due to luck/bad luck.

But the minimum-maximum analysis shows that at least some companies can be characterised as having a good or bad timing abilities, namely the ones which has shown it more than once. These companies are shown in table 8 below.

Table 8

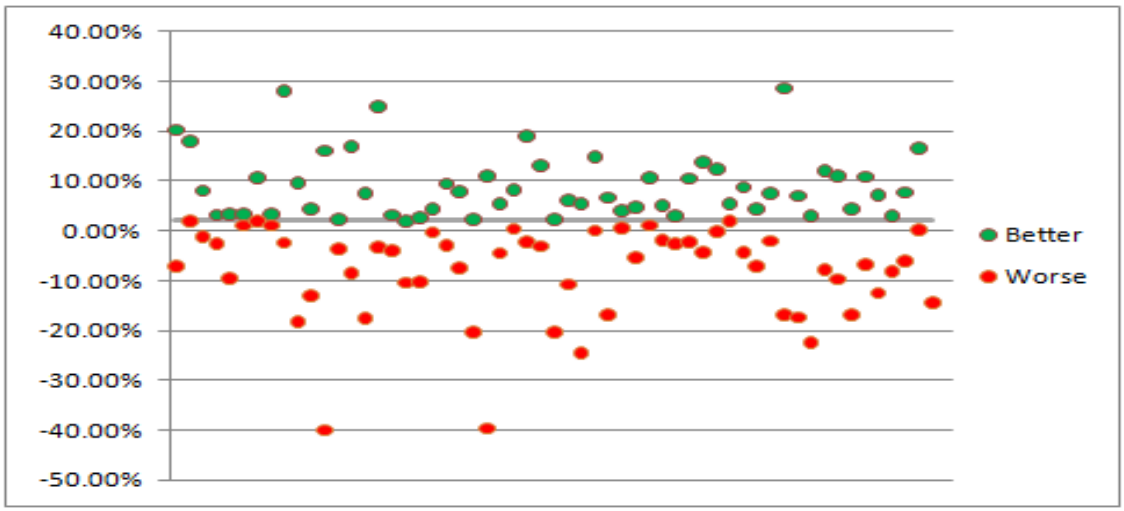
Good timing	Bang & Olufsen	DSV	Nordea	Novo Nordisk
Bad timing	IC Companys			

Assessment ability

The timing analysis showed that to some extent it was possible to label companies as good or bad timers – at least the most extreme cases. But what about their ability to assess their own share price on the longer term?

Diagram 5 below shows the return on all buybacks in period 1. The average return was 0,6% but the median is 1,4%. Returns marked with green are higher than1,4% and returns marked with red are lower.

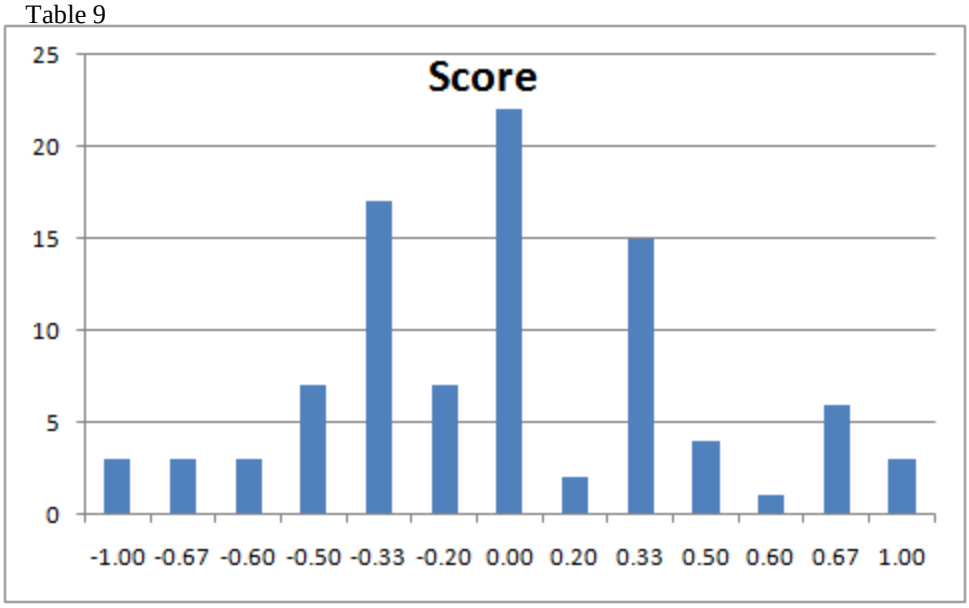
Diagram 5



This procedure is done with all periods from 1 to 5 years. Buybacks are given points such that a green mark earns 1 point whereas a red mark earns -1 point. Points are cumulated and finally divided by the number of periods the buybacks has been represented.

All buybacks will end up with a score between -1 (below the median in all periods) and +1 (above the median in all periods). Off course buybacks which are only represented in 1 period because they were conducted in late 2010 will be in one of the extreme ends of the scale. A categorisation based on just 1 observation is too uncertain so only buybacks which are represented in 3 or more periods will be used in the sample.

Table 9



If companies where either good or bad at assessing their share price the diagram above would only have two pillars – one at -1 and one at +1 since the bad assessors would always be in the

bottom half of the return scale as shown with red marks in diagram 5 and the good assessors would always be in the top half. But the result is not as black and white as whished. In fact 67,74% of the 93 buybacks analysed has a total score between -0,33 and +0,33. This indicates that most buybacks are not just good or bad. Some years they outperform the total sample and some years they underperform. For an investor this is not good news. Investors want to pick the winners from the losers but if 2/3 are winners one year but losers the next it is not possible to distinguish the good from the bad. It also further supports to idea that the success of share buybacks are random since 2/3 of the companies show no sign of being either good or bad but rather medium at conducting share buybacks.

The good news is that 1/3 still can be categorised as good or bad namely the buybacks with scores lower than -1/3 or above +1/3 as these show tendencies to under- or outperform consistently. This group will be further analysed below.

Table 10 below shows the companies with buybacks classified as bad as their score is below -1/3. It is interesting that of the 8 companies listed, 3 have more than 1 buybacks classified as bad. In fact Lundbeck has 7 buybacks which is marked as bad. If measured as a percentage of all the buybacks done by the company 4 out of 8 have more than 50% of their buybacks classified as bad. Off course 2 out of the 4 had only conducted 1 buyback but it still shows that there might be some sign of a missing ability. It is not just a matter of luck or bad luck. Particularly Lundbeck and DLH have a high percentage compared with the total number of buybacks. If 7 out of 12 buybacks are classified as bad as is the case for Lundbeck it cannot be attributed to bad luck.

Table 10

	Number of bad	Total number	As percentage
DLH	2	3	67%
H+H	1	1	100%
IC Companys	1	9	11%
Lundbeck	7	12	58%
RTX	1	1	100%
Danisco	1	4	25%
ØK	1	3	33%
Royal Unibrew	2	8	25%

The companies with buybacks ranked as good (score above +1/3) are shown below. Only 2 companies have more than 1 buyback ranked as good. They have however 3 and 5 respectivly and have as such shown their ability more than once. Lundbeck also appears on the list with one buyback but considering the number of bad buybacks they also have I am likely to attribute it to luck.

Table 11

	Number of goods	Total buybacks	As percentage
Novo Nordisk	5	16	31%
Sanistål	1	2	50%
Flygger	1	1	100%
RIAS	1	1	100%
Nordea	1	7	14%
DSV	3	11	27%
Lundbeck	1	12	8%
Solar	1	3	33%

To sum up, a buyback where the returns in all periods were below the median is classified as bad assessment. If a company show bad assessment more than once it is classified as having a very negative ability to assess its share price.
For instance Royal Unibrew has shown this negative ability 2 times which corresponds to 25% of all the buybacks done by this company. Should these companies perform share buybacks at all or would the shareholders be better off with dividends instead? Clearly they should not conduct share buybacks as they are more likely to destroy value for the share holders then create it.

Unlike the bad assessors some companies show the ability to assess their share price well. For instance Novo Nordisk has shown the ability 5 times corresponding to 31% of all their buybacks. These companies seem to be able to create shareholder value as their ability to assess their own share price seems better than average.

Putting together the timing and assessment ability

When taking both the timing ability and the assessment ability into consideration a clear picture shows as several companies are represented in both categories.

Table 12

Bad at timing and assesement	IC Companys		
Good at timing and assesement	DSV	Nordea	Novo Nordisk

It seems that some companies are good at conducting share buybacks both short term and long term and especially one company is bad at it. But the overall conclusion on the companies ability to perform share buybacks is not clear. They do not automatically posses information which is superior to the market and as an investor some sort of screening is necessary in order to find the companies who has the ability the create shareholder value through share buybacks and avoid the companies who destroy value.

Screening for success

From an investor point of view it is important to be able to pick the companies who are more likely to succeed with share buybacks and stay away from those companies who destroy value for shareholders. The above analysis points in the direction that companies who are good at timing their buybacks also create value long term.
The following analysis is based on a portfolio of the buybacks which are represented in the first three measure periods. This gives a total of 93 buybacks.

These are again ranked as either good or bad as shown in diagram 6 below dependent on whether their return is above or below the median. The continued performance of these buybacks is shown in diagram 7 and 8 below which shows the return in 1 year and 2 years. All green marks are buybacks ranked as good in the first period. It is clear that an above median return in period 1 is not equal to an above median return in period 2 and 3. In fact only 53% of the buybacks ranked as good based on their return in period 1 is still ranked good in period 3. So it seems that a selection based on the period 1 return is not suitable.

Diagram 6

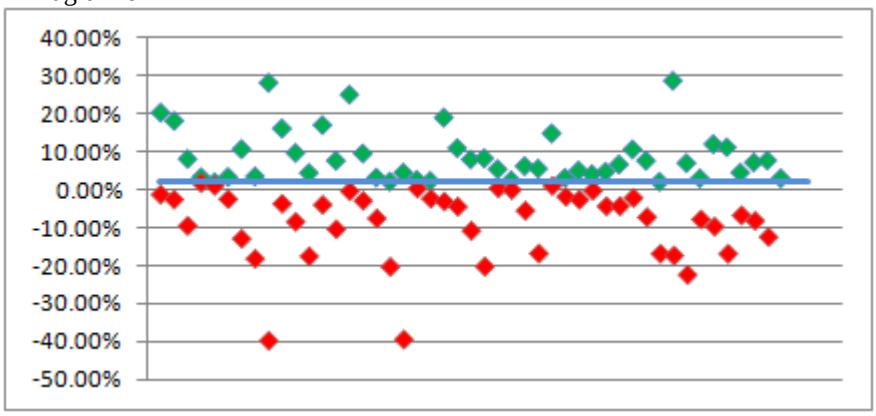


Diagram 7

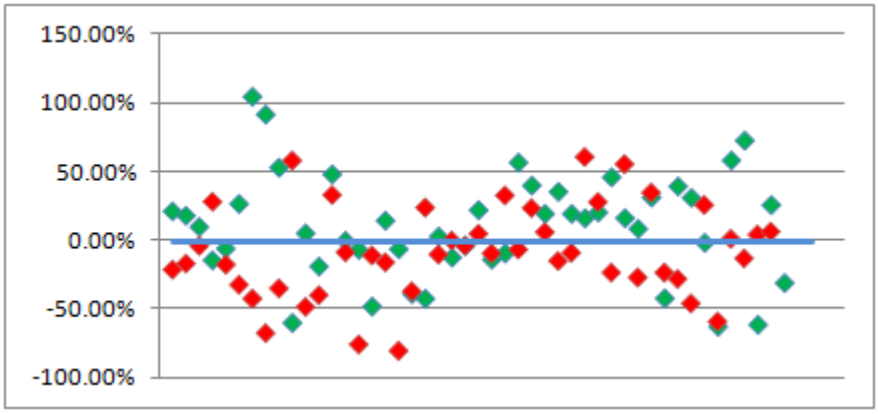


Diagram 8

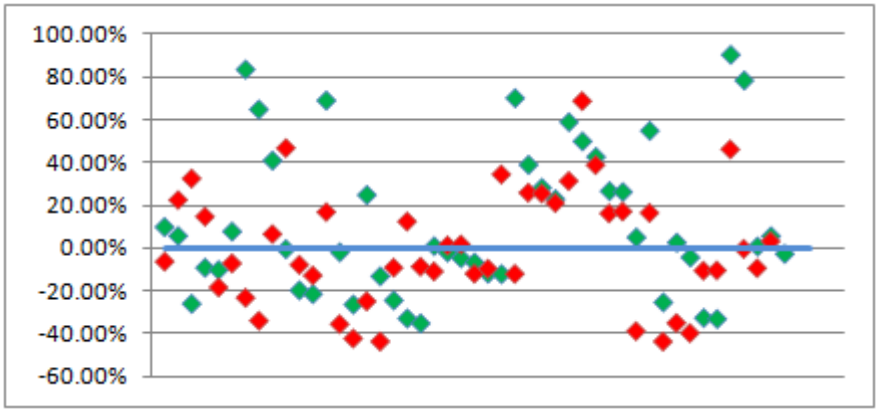


Table 13 below shows the return on two portfolios. The portfolio named “Good” consists of all the buyback ranked good in period 1 and the portfolio named “Bad” consists of all buybacks ranked bad in period 1.

Table 13

	Corrected period 2	Period 3	Total
Good average year-to-year return	1%	13%	14%
Bad average year-to-year return	-1%	15%	13%
Total sample	0%	14%	14%

As it can be seen there is almost no difference in the return on the two portfolios.

The return for period 2 has been corrected such that the return for period 1 is not included. Had the period 1 return been used as a screening tool for investments the investment would have been done after period 1 and the return earned in period 1 should therefore not be included. This shows that the return earned in period 2 is actually created in period 1 which is a sub-period in period 2. So the return from period 1 is not a good screening tool for investing as it does not create any value compared to an investment in all buybacks.

But what if the return for both period 1 and 2 are used such that only buybacks with a return above the median in both periods are included in the good portfolio and only buybacks with a return below the median in both periods are included in the bad portfolio?

Table 14

Good average return Period 3	12.09%
Bad average return Period 3	17.03%
Total sample return period 3	13.97%

This actually creates portfolios where the bad buybacks outperform the good!

This puts the final nail in the coffin – previous returns are not suitable as a screening tool when investing in buybacks. As my analysis regarding timing and assessment abilities showed that some companies seem to posses these abilities it is surprising that it does not create any value to invest by these rules. The conclusion must be that even though some companies show signs of being good at conducting share buybacks the share is too small and the overall result is blurred by the majority which do not posses these abilities.

So maybe some other screening tool will have more success.

In the following I analyse two parameters which previous studies have shown might have an influence on the return. The two parameters are company size, measured by their market

value, and the price-to-book ratio which might show whether companies are under- or overvalued.

Market value as determinant

Previous studies by for instance Ikenberry, Lakonishok & Vermaelen (2000) has shown that the size of the company conducting share buybacks might be a determinant for the return earned on the share buyback. They find that smaller size companies in general outperform large size companies. One possible explanation is that the share price of smaller companies might be more out of synch with the intrinsic value as these companies are less analysed by investors.

In order to test this, the companies in the sample have been tiered by their market value into 10 tiers. As table 15 below shows some tiers are empty while others contain very few buybacks. This makes the test statistical uncertain. I have however chosen to do my analysis on all tiers knowing that the conclusion will be weak. The alternative would be to only analyse the 3 top tiers but as these might be quite homogenous it would not be possible to conclude if size matters.

Table 15

Tier	Number	As percentage
1	57	50%
2	19	17%
3	25	22%
4	0	0%
5	7	6%
6	1	1%
7	1	1%
8	0	0%
9	3	3%
10	0	0%

Table 16 show the yearly returns and the total return for the Tiers. There does seem to be some correlation between return and size. The median for tier 1 and 2 are almost identical and markedly higher than the rest, if tier 9 is excluded. The return is generally falling the lower the tier. Tier 1 and 2 actually has a positive average for all periods whereas none of the other tiers can produce this. Off course tier 6 and 7 only contains 1 buyback each so these returns are not representative.

Table 16

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total return
Average Tier 1	2.25%	12.13%	13.36%	0.00%	4.71%	46.14%	98.86%
Median Tier 1	2.75%	7.19%	5.74%	-4.02%	1.41%	42.10%	61.07%
Average Tier 2	1.54%	11.25%	18.84%	12.63%	6.42%	45.68%	134.41%
Median Tier 2	0.64%	-5.14%	20.95%	16.94%	-6.55%	33.60%	68.58%
Average Tier 3	0.45%	-18.90%	8.59%	29.74%	112.31%	42.07%	246.20%
Median Tier 3	2.96%	-21.23%	-26.58%	1.71%	75.49%	14.85%	22.07%
Average Tier 5	-6.57%	-6.28%	30.85%	34.29%	11.70%	-49.53%	-13.26%
Median Tier 5	-5.20%	-35.44%	46.17%	43.24%	31.46%	-54.46%	-23.28%
Average Tier 6	-7.79%	25.18%	-36.72%	-52.23%	85.26%		-35.36%
Median Tier 6	-7.79%	25.18%	-36.72%	-52.23%	85.26%		-35.36%
Average Tier 7	-22.52%	-46.35%	-60.62%	-60.00%	81.60%		-88.11%
Median Tier 7	-22.52%	-46.35%	-60.62%	-60.00%	81.60%		-88.11%
Average Tier 9	-7.98%	16.25%	45.78%	17.11%	33.47%	32.05%	221.91%
Median Tier 9	-7.00%	16.25%	45.78%	17.11%	33.47%	32.05%	225.33%

Table 17 below shows the return for a portfolio consisting of only tier 1 and 2 buybacks and a portfolio consisting of all the other tiers. Interestingly the average total return is higher in the portfolio consisting of tier 3-9 but the standard deviation is also much higher. The median is highest for the portfolio of Tier 1+2 which indicates that the "quality" of the returns is better in this group. The lower average seems to be due to the very high returns in Tier 9 which pulls up the overall return for the group called Rest. Even though the average is highest in the "Rest" group I do not hesitate to conclude that there is a positive link between size and return if tier 9 is excluded. So size does matter – but not as expected.

Table 17

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total return
Average return Tier 1+2	2.07%	11.88%	15.00%	4.30%	5.14%	46.00%	110.25%
Median return Tier 1+2	2.41%	4.91%	8.47%	5.01%	-1.87%	36.55%	63.98%
Std. Dev. Tier 1+2	0.08635	0.33408	0.39822	0.38602	0.44504	0.53453	
Average return Rest	-2.41%	-13.89%	12.10%	23.59%	86.52%	13.59%	146.66%
Median return Rest	0.00%	-18.06%	-7.69%	12.39%	57.26%	-8.28%	22.61%
Std. Dev. Rest	0.14801	0.40489	0.87932	1.02787	1.03816	0.69989	

Clearly the average return is largest in the group containing the smaller companies but at the same time the median is lower. This point in the direction that the return on the smaller companies is more volatile with a few companies producing very large returns. In general the return on large size companies seems more homogenous and the small size companies seem more like a lottery ticket. So the conclusion to whether size matters or not depends on

whether average returns or median returns are used. As discussed earlier I prefer to use the median return as a measure of the general abilities of the companies.

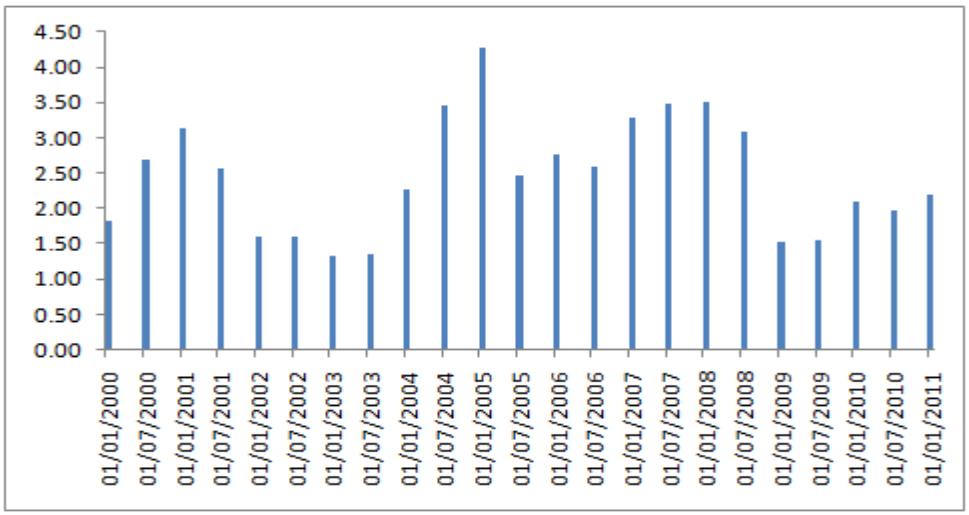
By using the median the conclusion on size must be that in the Danish market large size companies are better at conducting share buybacks than small size companies. This off course conflicts with prior studies in other markets where the opposite was found to be true. The question is if the large size Danish companies would be classified as large or small size of they were included in for instance studies on US companies. I am inclined to think that compared to US companies the large size Danish companies would be classified as small size. So in an international perspective all Danish companies, with a few exceptions, are classified as small and hence the possible undervaluation might be equally large for both large and small size Danish companies.

Price to Book as determinant

The size analysis showed that for Danish companies size mattered – but opposite of what international studies has shown. I now move on to my analysis of the second determinant namely the price-to-book ratio. As mentioned in the theory discussion the price-to-book ratio can be used as a measure of undervaluation – but it should be used with caution. This is due to the fact that the price-to-book ratio differs from industry to industry where capital intensive industries in general have low price-to-book ratios whereas industries which are more reliant on human capital has higher price-to-book ratio. It is therefore not the absolute level of the price-to-book ratio which is interesting but rather the relative level. In my analysis I have therefore chosen to tier the companies after their price-to-book ratio such that companies with similar price-to-book ratios are compared.

Diagram 9 below show the average price-to-book ratio for all companies listed at the Copenhagen stock exchange at the points in time where the tiers have been created. I have chosen to rebalance the tiers every 6 month. This time span has been chosen as a balance between using short or long time horizons. Short horizons is good at catching changes but is very time consuming to calculate whereas longer horizons is less time consuming but also less good at reflecting changes in the underlying data. The 6 month has been chosen as this is also the usual time horizon used when index are rebalanced. As the diagram depicts the price-to-book ratio varies over time. This means that the absolute value of the price-to-book ratio is not a good measure to evaluate on but rather the relative value should be used.

Diagram 9



The buybacks has therefore been tiered in the same way as in the analysis of market value.

These tiers are shown in diagram 10 below. Nearly 2/3's of all the buybacks are in tier 1 and 2 and if tier 3 is included it covers 79% of all the buybacks. The average tier-value of the total sample is 3, so the companies in the sample has an above average price-to-book ratio. Had the price-to-book ratio in the sample mirrored the general market the average tier-value should have been 5 or 6 as these are the mid-tiers. Had the price-to-book ratio been even across industries this finding would be surprising as it would have been expected that companies with low price-to-book ratios would be more undervalued and thus more inclined to distribute cash through share buybacks.

Price-to-book ratios are however not equal across industries and as such the average tier value of 3 does not say anything about the perceived undervaluation. It can however be used as a measure to determine whether it is high or low price-to-book ratio companies that perform the best.

Diagram 10

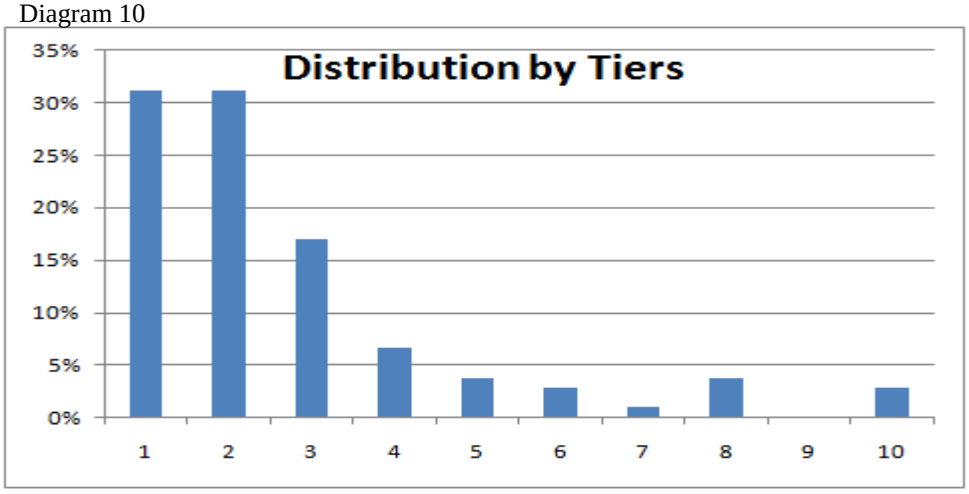


Table 18 below shows the average and median total returns by tier. As the table contains a lot of numbers it might be a bit difficult to see any patterns so the top 3 tiers by return are shown in table 19.

Table 18

		Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Tier 1	Average total absolut return	1.21%	0.74%	3.69%	-18.31%	-27.50%	-2.69%
	Median total absolut return	3.23%	-5.73%	-17.79%	-21.48%	-34.31%	-19.33%
Tier 2	Average total absolut return	2.11%	9.74%	16.55%	2.32%	-10.64%	27.95%
	Median total absolut return	2.96%	5.46%	10.63%	-17.40%	-25.96%	1.67%
Tier 3	Average total absolut return	1.60%	3.21%	-2.80%	-19.63%	-8.46%	76.93%
	Median total absolut return	2.73%	-8.34%	-7.77%	-37.81%	-29.90%	76.93%
Tier 4	Average total absolut return	-1.40%	-8.02%	7.56%	29.15%	124.40%	249.19%
	Median total absolut return	-3.91%	-10.16%	6.18%	-14.79%	44.98%	380.46%
Tier 5	Average total absolut return	-1.60%	-42.63%	-19.34%	-16.67%	-31.40%	6.92%
	Median total absolut return	-1.92%	-60.40%	-10.35%	2.47%	-31.40%	6.92%
Tier 6	Average total absolut return	-2.12%	29.54%	55.20%	25.03%	47.07%	87.20%
	Median total absolut return	0.00%	29.54%	55.20%	25.03%	47.07%	87.20%
Tier 7	Average total absolut return	1.13%	-18.13%	-37.64%	17.55%		
	Median total absolut return	1.13%	-18.13%	-37.64%	17.55%		
Tier 8	Average total absolut return	4.19%	32.76%	106.39%	198.93%	255.06%	39.78%
	Median total absolut return	4.17%	58.08%	152.88%	250.04%	255.06%	39.78%
Tier 10	Average total absolut return	-22.91%	-48.75%	-34.60%			
	Median total absolut return	-16.06%	-42.93%	-47.32%			

The average buyback was placed in tier 3 but the top 3 tiers shown below have a much higher average as shown in the table. This indicates that it is the lower tiers that perform the best which is also in line with what was expected. Caution is however warranted regarding any conclusions in this analysis. First of all Tier 7 and 10 has no returns in period 5 and 6 and in general the number of observations in period 5 and 6 is fairly small in many of the tiers which off course introduces a large statistical uncertainty. Period 1 to 4 does however contain most of the observations so any conclusions based on these periods are more valid. This does however not change the overall picture that the lower tiers outperform the higher ones.

Table 19

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Ranked 1	Tier 8	Tier 8	Tier 8	Tier 8	Tier 8	Tier 4
Ranked 2.	Tier 1	Tier 6	Tier 6	Tier 6	Tier 6	Tier 6
Ranked 3	Tier 2	Tier 2	Tier 2	Tier 7	Tier 4	Tier 3
Average tier	3.66	5.33	5.33	7	6	4.33

The same applies when we turn to year-to-year returns instead of total returns. It might change the specific tiers in the top 3 but it is still the lower tiers that performs the best which is also seen in the fact that the average is still higher than 3.

Table 20

		Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Tier 1	Average year-to-year absolut return	1.21%	0.74%	28.38%	38.92%	106.75%	21.01%
	Median year-to-year absolut return	3.23%	-5.73%	4.05%	29.66%	55.99%	9.68%
Tier 2	Average year-to-year absolut return	2.11%	9.74%	7.74%	-10.84%	16.31%	60.49%
	Median year-to-year absolut return	2.96%	5.46%	-1.62%	-9.25%	2.25%	41.68%
Tier 3	Average year-to-year absolut return	1.60%	3.21%	-11.43%	8.03%	76.61%	22.76%
	Median year-to-year absolut return	2.73%	-8.34%	-11.78%	-7.41%	85.26%	22.76%
Tier 4	Average year-to-year absolut return	-1.40%	-8.02%	8.31%	12.94%	49.35%	58.41%
	Median year-to-year absolut return	-3.91%	-10.16%	-2.16%	7.00%	69.43%	80.71%
Tier 5	Average year-to-year absolut return	-1.60%	-42.63%	54.94%	5.61%	-29.42%	55.88%
	Median year-to-year absolut return	-1.92%	-60.40%	46.37%	4.02%	-29.42%	55.88%
Tier 6	Average year-to-year absolut return	-2.12%	29.54%	20.15%	-14.96%	12.34%	23.86%
	Median year-to-year absolut return	0.00%	29.54%	20.15%	-14.96%	12.34%	23.86%
Tier 7	Average year-to-year absolut return	1.13%	-18.13%	-23.83%	88.49%		
	Median year-to-year absolut return	1.13%	-18.13%	-23.83%	88.49%		
Tier 8	Average year-to-year absolut return	4.19%	32.76%	50.16%	46.58%	-11.08%	-67.96%
	Median year-to-year absolut return	4.17%	58.08%	46.17%	48.06%	-11.08%	-67.96%
Tier 10	Average year-to-year absolut return	-22.91%	-48.75%	21.16%			
	Median year-to-year absolut return	-16.06%	-42.93%	-2.72%			

Table 21

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Ranked 1	Tier 8	Tier 8	Tier 5	Tier 7	Tier 3	Tier 4
Ranked 2.	Tier 1	Tier 6	Tier 8	Tier 8	Tier 4	Tier 5
Ranked 3	Tier 2	Tier 2	Tier 6	Tier 1	Tier 1	Tier 2
Average tier	3.66	5.33	6.33	5.33	2.66	3.66

Next step is to see if the price-to-book ratio can actually been used to screen buybacks in order to increase the return.

Two portfolios are created. The first portfolio contains buybacks from tier 1 to 3 and the other portfolio contains buybacks from tier 4 to 10. If the lower tier in general outperforms the higher tier the portfolio containing tier 4-10 should have the better return.

Table 22

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Average total return Tier 1-3	1.65%	4.80%	7.23%	-9.09%	-13.89%	25.32%
Median total return Tier 1-3	3.16%	-2.44%	-3.82%	-21.89%	-26.63%	-2.42%
Average total return Tier 4-10	-3.34%	-11.87%	13.48%	49.57%	118.94%	126.05%
Median total return Tier 4-10	-1.75%	-23.92%	1.71%	14.31%	62.33%	78.19%

But the picture is not clear on this matter. Tier 1-3 actually has the best return in the first two periods whereas Tier 4-10 performs better in the subsequent periods. It seems that the lower tier buybacks takes longer time to start performing. It seems that the best investment strategy would be to buy buybacks from tier 4 to 10 after 1 year. The return from such an investment is shown below in table 23. The return for a investment in all buybacks is shown for comparison. The outperformans is stricking.

Table 23

	Period 3	Period 4	Period 5	Period 6
Average total return Tier 4-10	28.77%	69.72%	148.44%	156.51%
Average total return all Tiers	10%	-2%	17%	15%

Conclusion on the absolute return analysis

So what have the absolute return analysis shown?

The aggregate analysis showed that more than half of the buybacks had negative returns in most periods. Only the period until the first update of the financial statements showed a positive median return. Also the 5 year total return was positive with 11,8% which corresponds to a yearly return of 2,26%.

Correcting the data such that it is comparable across periods showed that most value seems to be created during the first 2 years of the buyback. In general the average return on the buybacks where higher than the median return. Seen from an investor perspective the average return is a good measure and thus investors can make money on investing in companies performing share buybacks. But using the median return as a measure of the companies abilities show that approximately half of the companies destroyed value for the shareholders by earning negative returns on the share buybacks. This is surprising as it would have been expected that an overweight of companies where able to at least produce a positive return as they ought to be better at evaluating their own share price than outside investors. This does however not seem to be the case.

Off course the results are influenced by the general market development, especially the financial crisis in 2007-2009. Nevertheless the absolute returns calculated in this thesis is the actual returns earned by the companies – there might be reasons for the poor performance but it does not change the fact that on average companies were not able to increase shareholder value through share buybacks.

My analysis of the companies timing and assessment abilities showed that in general there was no clear sign of companies being either good or bad at conducting share buybacks.
The fact that equally many buybacks had more upside than downside as the opposite shows that companies do not posses any abilities to launch the buyback at the right time. The price development in the period of the actual buyback is random.
When scoring buybacks on whether they had returns above or below the median return most buybacks ended up scoring 0, meaning that they had as many periods with returns below the median as above.
All of this put together shows that with a few exceptions companies do not posses any special abilities that makes them better than outside investors at evaluating their own share price.

I then investigated possible screening tools which investors could use in order to enhance the return. I analysed past performance, market size and price-to-book ratios in order to see if the return on portfolios build from this determinants could outperform the general sample.

I found that the performance in period 1 and 2 had no influence on the return in period 3 and as such past performance had no influence on the expected future return. This further supports the notion that companies do not assess any special abilities to conduct share buybacks.

My analysis of the size and price-to-book determinants did however show that some screening is possible for investors.
I found that regarding size the larger companies outperformed the smaller when the median returns where considered. If looking at the average return the small size companies where better but it was interpreted as a lottery ticket where profits and losses are larger then for larger size companies. This was not in line with international studies which have shown that small size companies outperform large size companies. The price-to-book ratio was however confirmed as companies with lower price-to-book clearly outperformed companies with higher price-to-book. It also showed that the return on low price-to-book buybacks where generally obtained later as it was in period 3,4,5 and 6 that value was created.

Overall the analysis showed a picture of random success. There was not found any clear indications that companies in general add value for shareholders by distributing cash via share buybacks rather than via dividends.

Relative return analysis

As the absolute return analysis showed, in general companies showed no signs of creating value for the shareholders by conducting share buybacks. A few companies however showed signs of being able to time their buybacks well. Furthermore some companies showed signs that they were in fact able to assess their own share price such that they could take advantage of an undervalued share price and thus create value for the shareholders. But only a small percentage of the buybacks showed signs of both good timing and assessment. This analysis was useful for simple investors who invest to gain absolute return since they do not hedge their investments.

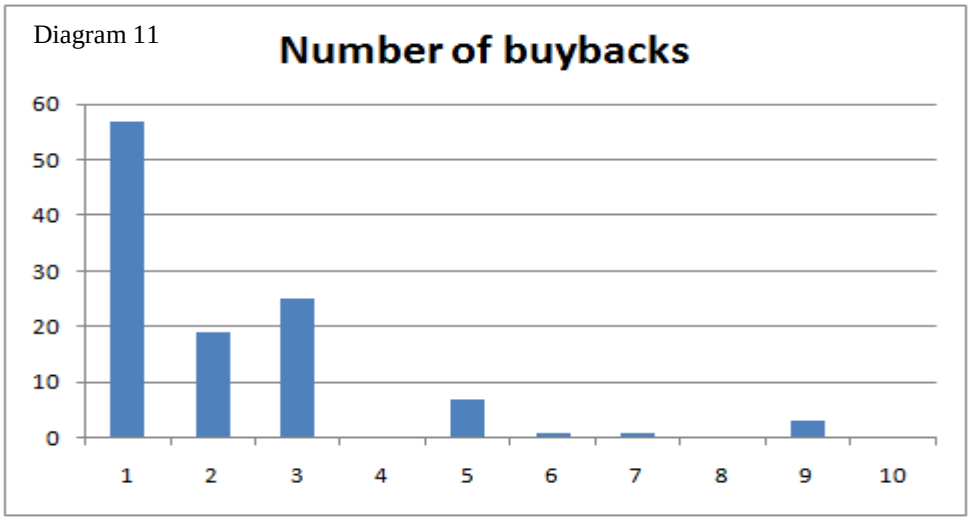
This next section focus on the relative return obtained from the buybacks. The relative return does not tell anything about the companies abilities to time and assess their share price. Nevertheless it is of interest to institutional investors who hedge their investments and therefore use relative return as a measure of their success.

As with the absolute return I start with a presentation of the aggregate data and then move on to analyse it further.

In order to analyse which benchmark is the better the buybacks have been divided into tiers dependent on the market value of the company. All shares listed at NasdaqOMX Copenhagen have been divided in 10 tiers and the buyback has afterwards been marked after which tier the company was in at the time of the beginning of the buyback.

The result can be seen in diagram 11 below.

Diagram 11



It is quite evident that most of the companies performing buybacks fall into tier 1-3. In fact 99 out of 110 of the buybacks conducted are in tier 1-3 which corresponds to 90%. So the analysis presented in the following section will all be done with OMX Copenhagen Benchmark GI which consists of the 60-80 most traded shares on the Copenhagen stock exchange as benchmark.

Table 24 below shows the relative return for the total sample. As the table show the total portfolio of buybacks do not create any value that could not have been gained by investing in the total stock market. In fact the total portfolio underperforms slightly.
The table also shows that half of the companies underperformed heavily, especially on the longer term of 4 to 5 years.

The lack of performance supports the findings from the absolute return analysis that companies do not create value for the shareholders. In the absolute return analysis the results were off course greatly influenced by the development in the general market such as the financial crisis in 2007-2009. This effect should however be removed when relative returns are used, hence it is surprising that share buybacks relatively underperforms the general market.

Table 24

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Average total relative return	-1.47%	-3.59%	-4.84%	-1.98%	-3.93%	1.10%
Median total relative return	-1.52%	-5.66%	-5.88%	-6.44%	-32.81%	-28.73%

The median return shows that more than half of the companies underperforms during the first year (period 2) and then performs more or less in line with the market for the coming two years as the total return is table from period 2 to 4.

In order to compare the returns from different periods the same correction as with the absolute return is presented below.
Table 25 shows the relative return for the 33 buybacks which was conducted before 1/5-2006 such that returns for all periods is available.

Table 25

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Average total relative return	-0.40%	3.38%	-1.47%	1.13%	5.79%	1.10%
Median total relative return	-2.47%	1.26%	-18.69%	-2.13%	-16.68%	-28.73%

The corrected portfolio shows some periods with underperformance and some with outperformance whereas the complete portfolio shows a small underperformance in all periods. It is however interesting that more than half of the companies show a rather large underperformance in both portfolios shown by the median return. Only exception is period 2 which has a small outperformance in the corrected portfolio. As with the absolute return it seems that some sort of screening which excludes the half with poor performance might enhance the return.

It is also quite surprising that more than half of the buybacks has a negative relative return. As mentioned in the theory section the most common reason for buybacks stated by the companies is to take advantage of an undervalued share price and thus create value for the shareholders. Judging by the two tables presented above the creation of value for the shareholders is hard to find. In fact companies fail in more than half of the cases to create value. Instead they seem to destroy value.

Both the absolute return for the individual buybacks and the return on the benchmark are calculated as total returns which mean that any dividends are reinvested. Maybe this is the explanation for the poor performance. The companies performing buybacks is expected to have smaller dividends than the whole benchmark as some of the free cash is used for buying back shares instead of paying dividends. The money spent on buybacks is not reinvested – and why should they? The only investors who receives money from a buyback is the investors selling their shares and they are unlikely to reinvest the proceeds in the share they just sold. Otherwise they would not have sold their shares. The non-selling shareholders do not receive any cash and as such they have nothing to reinvest.

A small numerical example might show what is at stake here.

Consider a company who pays 10% in dividend and at the time of the dividend the share price is 100. After 1 year the share price has gone up to 110. The dividends have been reinvested and have earned a return of 1 so the total return is equal to 21%. If the same company decided to buy back shares instead the share price after 1 year should be 121 in order to have the same return. So the share price of the repurchasing company must go up by more to offset the missing reinvestment. Off course this accelerates the longer the periods. Maybe this is the explanation why the buybacks seem to underperform more and more the longer the horizon.

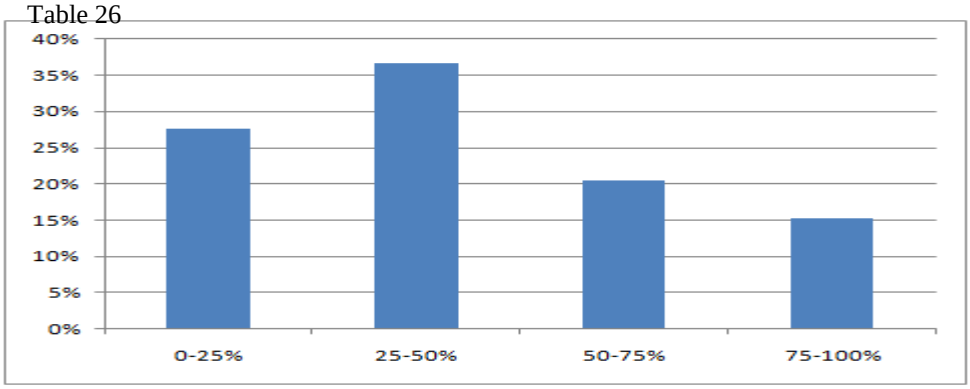
Another explanation could be that companies who conduct share buybacks are cash cows, meaning that they do not have sufficient NPV-positive projects to use all the free cash flow from operations. These companies might underperform on longer horizons as they do not have the same growth potential as companies who are able to invest the free cash flow in NPV-positive projects.

Or maybe the companies who performs buybacks is just a mirror of the general market – when doing relative returns half the companies are expected to outperform and half are expected to underperform. There have to be winners and losers in a relative game. And maybe the companies who perform share buybacks do not possess the ability to assess their own share price with success.

To illustrate whether the companies are good at assessing their share price relative look at table 26 below. It shows the percentage of the returns which are positive for each buyback. It shows that 28% of all buybacks had positive returns in between 0-25% of the periods it was represented. In the other end of the scale 15% of the buybacks had positive returns in 75-100% of the periods it was represented. It clearly shows that there is an overweight of buybacks which has more negative than positive returns. In fact 64% of the buybacks had more negative than positive returns. What cannot be seen from the diagram is that 14% of all buybacks had negative relative returns in all the periods it was represented and 13% had positive relative returns in all periods it was represented.

As an advanced investor it is possible to make money in these two groups. You can either buy the group with all positive returns and hedge it by selling short the benchmark or you could sell short the group with only negative returns and by the benchmark as hedge. It is therefore interesting to see how these two groups evolve.

Table 26



In the following I use a portfolio of buybacks with return history for the periods 1 to 4. I have chosen to omit the 4 and 5 year returns as the sample size is too small for the long horizons. By focussing on period 1 to 4 I end up with a total sample size of 72 buybacks which is suitable to do analysis on. Should the 4 and 5 year returns have been included the sample size would only have been 33.

Table 27 below shows how the number of buybacks with all positive or negative returns evolves over time.

Table 27

	Period 1	Period 2	Period 3	Period 4
% positive	43.8%	50%	56%	56%
% negative	56.2%	66%	59%	69%

The interpretation is as follows: In period 1 43,8% of the buybacks had a positive relative return. Of these, 50% had a positive return in period 2 as well. Of the buybacks with positive return in both period 1 and 2, 56% also had a positive relative return in period 3. In general the numbers falls close to 50% which could indicate that it is more or less random if the subsequent return will be the same as the previous. However the numbers are larger for the buybacks with negative return which could indicate that there is a larger correlation between previous and subsequent returns for this group. Larger correlation would reduce the risk for investors of surprises and in this case a large correlation is wanted. Had the correlation been 100% you could be sure that in investment in the negative group made after period 1 would produce a negative return after period 2. This is not the case as the correlation is not 100% but nevertheless it seems that investing in the negative group has a higher chance of success than investing in the positive group.

So maybe it could be useful to use the previous return as an investment strategy for buybacks with negative return.

It should be noted that the indicator does not say anything about the size of the expected relative return but only whether it is expected to be positive or negative.

Using the indicator to build portfolios

In the following section I analyse the returns on different portfolios which has been created by using the above mentioned indicator. Returns will be calculated on both portfolios consisting of good and bad buybacks and returns for both period 3 and 4 will be calculated.

Table 28 below shows the return on portfolios which has been build simply by using the return from the previous period as selector. The positive portfolio had a positive return in period 1 and 2 whereas the negative portfolio had a negative return.

Table 28

	Period 3	Period 4
Positive: Average total relative return	0.13%	-0.25%
Negative: Average total relative return	-0.46%	-1.05%

As with the absolute return analysis of past performance, this analysis shows that the correlation between past and future return is very low. This supports the notion from previous that buybacks in general cannot be classified as either good or bad. The return from period to period seems random which is an indication that the companies performing share buybacks do not have any superior ability to assess their own share price.

But before a final conclusion is drawn on the subject of past and future return one final analysis is made. Portfolios are build such that returns for both period 1,2 and 3 are either positive or negative. More emphasis is now put on past performance in order to check if the supposedly superior information is more related to future earnings.

Table 29

	Period 4
Positive: Average total relative return	3.05%
Negative: Average total relative return	10.40%
Corrected Negative: Avrg. Tot. Rel. Return	-22.40%

Table 29 above shows the returns on these portfolios. The return on the positive portfolio has increased compared to the portfolios where only the last period return was considered. Interestingly the return has also increased for the negative portfolio. In fact it now outperforms the positive portfolio massively. The numbers does however cheat a bit. Two buybacks in the negative portfolio had returns in period 4 of 190% and 290% which off

course increases the average markedly. A corrected portfolio leaving out these two buybacks are included in the table. If these two buybacks are excluded the portfolio shows a massive underperformance of -22,4%. Off course investors who had used the previous returns to build portfolios would have realized a return similar to the portfolio including the two buybacks. Nevertheless it shows how sensitive the returns are to single buybacks performing exceptional. So this points to a strategy where some stop-loss limit should be applied as this would have reduced the loss of 10,4% and moved it in the direction of the corrected portfolio if the two exceptional performing buybacks had been excluded ones a certain limit was reached. Otherwise options could have been used to limit the loss. This would off course also reduce the overall return but buying call options which is 50% out of the money should be possible without spending too much money. It is however out of reach for this paper to examine option strategies to hedge the risk.

Based on the above analysis the following investment strategies seem to be able to outperform the general market.

1. Buybacks with a positive return in period 1,2 and 3 should be bought after period 3 and held until the end of period 4 . The position should be hedged against the benchmark.
2. Buybacks with a negative return in both period 1,2 and 3 should be sold and bought back at the end of period 4. The position should be hedged with a long position in the benchmark.

Market Value as a factor for success

In this section the general analysis based on previous returns will be expanded such that the market value of the company is taken into consideration.

The absolute return analysis showed that contrary to international studies there was a positive correlation between the size of the company and the return earned on the share buyback.

This will also be tested using relative returns. The purpose here is to see if the size of the company can be used as a successful screening tool by investors.

Unfortunately the sample is quite homogenous whit respect to the size of the company as shown earlier. In fact 3 out of 10 tiers do not have any buybacks and 3 tiers only contain 1 buyback each. In effect this result in a very large statistical uncertainty and any analysis on

these tiers should therefore be interpreted with caution. Nevertheless the analysis will be conducted as it might show some surprises.

Table 30

		Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Tier 1	Average year-to-year relative return	-1%	1%	-5%	-2%	-1%	19%
	Median year-to-year relative return	-1%	3%	-6%	2%	5%	12%
Tier 2	Average year-to-year relative return	-1%	15%	10%	5%	3%	12%
	Median year-to-year relative return	0%	10%	7%	1%	6%	4%
Tier 3	Average year-to-year relative return	-2%	-20%	8%	26%	78%	13%
	Median year-to-year relative return	0%	-16%	-23%	-11%	37%	-12%
Tier 5	Average year-to-year relative return	-2%	-12%	-5%	4%	-6%	-39%
	Median year-to-year relative return	-5%	-36%	6%	11%	13%	-35%
Tier 6	Average year-to-year relative return	-5%	-2%	-28%	-17%	42%	
	Median year-to-year relative return	-5%	-2%	-28%	-17%	42%	
Tier 7	Average year-to-year relative return	-38%	-52%	-14%	-98%	45%	
	Median year-to-year relative return	-38%	-52%	-14%	-98%	45%	
Tier 9	Average year-to-year relative return	-5%	-40%	56%			
	Median year-to-year relative return	-5%	-40%	56%			

Table 31

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Ranked 1	Tier 1	Tier 2	Tier 9	Tier 3	Tier 3	Tier 1
Ranked 2	Tier 2	Tier 1	Tier 2	Tier 2	Tier 7	Tier 3
Ranked 3	Tier 3	Tier 6	Tier 3	Tier 5	Tier 6	Tier 2

Overall there does seem to be a connection between size and return as tier 1, 2 and 3 is represented more than tier 5,6,7 and 9 in table 31 above which shows the three tiers with best return in the periods. This confirms the findings from the absolute return analysis and again contradicts the international findings.

Later I analyse if timing has any influence on the return so in order to remove any attributions from a timing factor the table below shows only the buybacks with full return history. This leaves out the buybacks conducted after 1/5-2006. As previous this makes the returns in different periods more comparable as the table only contains buybacks with return history in all periods.

The results presented in table 32 below still support the idea that size has influence on the return as tier 1 and 2 is represented more times in table 33 than tier 3 and 5.

Table 32

		Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Tier 1	Average year-to-year relative return	-4%	-9%	-12%	0%	0%	19%
	Median year-to-year relative return	-5%	-13%	-13%	-1%	8%	12%
Tier 2	Average year-to-year relative return	1%	23%	9%	-10%	3%	12%
	Median year-to-year relative return	-1%	32%	4%	-7%	6%	4%
Tier 3	Average year-to-year relative return	5%	-5%	-30%	-31%	64%	13%
	Median year-to-year relative return	3%	-4%	-29%	-28%	-5%	-12%
Tier 5	Average year-to-year relative return	8%	43%	26%	18%	-6%	-39%
	Median year-to-year relative return	-2%	44%	17%	15%	13%	-35%

Table 33

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Ranked 1	Tier 5	Tier 5	Tier 5	Tier 5	Tier 3	Tier 1
Ranked 2	Tier 3	Tier 2	Tier 2	Tier 1	Tier 2	Tier 3
Ranked 3	Tier 2	Tier 3	Tier 1	Tier 2	Tier 1	Tier 2

The influence of size does however not seem to be significant as the best performing tier changes from period to period. But on average it seems that size might have a small influence.

Timing as a factor

Even though timing should not be a factor when relative returns are used it seems as if it might do. In order to analyse this effect portfolios consisting of buybacks conducted in each year is created and analysed in the following section.

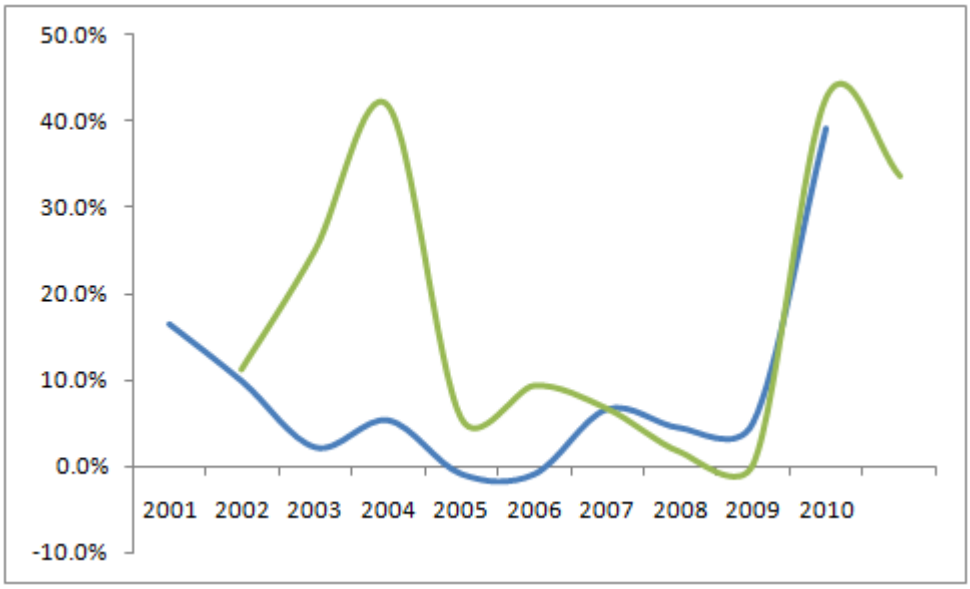
Table 34 below shows the returns for buybacks sorted by their start year. For instance all buybacks started in 2005 had an total return during the next 5 years of -4,9% which corresponds to roughly -1% in yearly return. Buybacks started in 2001 conversely had a total 5 year return of 82,1% corresponding to a yearly return of 16,4%. Remember that these returns are relative – the general market performance should not have any influence. Nevertheless it seems that the relative return on the buybacks is influenced by the general market performance.

Table 34

Start Year	Period 2	Period 3	Period 4	Period 5	Period 6	Total	Average
2001	1.9%	17.4%	-5.3%	30.6%	23.1%	82.1%	16.4%
2002	32.2%	20.0%	10.6%	11.0%	-23.6%	48.7%	9.7%
2003	10.1%	20.9%	4.3%	1.9%	-21.9%	10.6%	2.1%
2004	16.6%	0.2%	8.6%	-2.2%	1.8%	26.3%	5.3%
2005	2.3%	-12.2%	-11.9%	-4.8%	26.3%	-4.9%	-1.0%
2006	-22.4%	-15.9%	1.4%	51.7%	-5.4%	-5.1%	-1.0%
2007	-2.1%	-0.3%	27.6%	1.4%		26.2%	6.6%
2008	-4.8%	19.9%	-0.9%			13.1%	4.4%
2009	-6.6%	17.7%				10.0%	5.0%
2010	39.1%					39.1%	39.1%

Diagram 12 below shows the average return from table 34 above (the blue line) compared to the average return on the benchmark in the same period (the green line. For instance the average yearly return for buybacks started in 2007 were 6,6% over the next 4 years (it is not possible to calculate a 5 year return for 2007) and the benchmarks average return from 2007-2011 was 6,6% as well.

Diagram 12



Except for 2003 and 2004 the match is striking. Both 2003 and 2004 have few observations so maybe the differences in these years are due to statistical uncertainty.

Table 35 below show the returns that all buybacks had in different periods. For instance the average for all buybacks with return history in 2004 was 19,7%. This includes the 4 year

return for buybacks started in 2001, the 3 year return for buybacks from 2002 and so forth. Again huge differences from year to year can be observed.

Table 35

2001	1.9%
2002	24.8%
2003	8.2%
2004	19.7%
2005	8.2%
2006	-9.5%
2007	-10.8%
2008	-1.3%
2009	23.8%
2010	10.4%

But why should the relative return on share buybacks be correlated with the general market performance?

The only possible answer I can find has to do with financial gearing. A share buyback changes the capital structure such that the financial gearing is raised. This also makes the company more risky and thus creates larger volatility in the share price. When times are good, fewer shareholders share the profit and the share price outperforms the general market. In bad times the opposite is true. In order for this to be true it does however require that the financial gearing in companies conducting share buybacks are higher than the financial gearing in companies not performing share buybacks. Whether this is true or not is out of scope for this thesis to test so the answer is more a guess than an actual explanation.

Price to book analysis

In the absolute return analysis I performed an analysis on the relevance of the price-to-book ratio as a parameter for choosing which buybacks to invest in. It showed that companies with low price-to-book ratios had better returns than companies with high price-to-book ratios. This was in line with expectations as the price-to-book ratio can be used as a measure of whether a company is under- or overvalued. This analysis will be repeated on relative returns as it is off interest for investors to find determinants who can enhance the expected return.

Table 36 below shows the relative returns for the same 10 tiers that were used in the absolute return analysis. Looking at the column to the right which shows the average return over the

period a clear picture shows that the higher tiers outperform the lower. Tier 7 is an exception but this can be due to statistical uncertainty. In general the average yearly return is falling the lower the tier.

Table 36

	Period 2	Period 3	Period 4	Period 5	Period 6	Average
Average year-to-year relative returnTier 1	-2.30%	23.63%	30.08%	72.90%	-4.66%	32%
Average year-to-year relative returnTier 2	-5.16%	-1.27%	-2.71%	1.97%	26.97%	4%
Average year-to-year relative returnTier 3	4.81%	-25.17%	1.08%	61.77%	-3.33%	5%
Average year-to-year relative returnTier 4	-4.54%	-13.58%	-7.29%	31.15%	16.93%	3%
Average year-to-year relative returnTier 5	-21.05%	7.48%	-12.93%	9.15%	19.24%	-1%
Average year-to-year relative returnTier 6	-1.58%	48.23%	-8.42%	-49.80%	-14.79%	-9%
Average year-to-year relative returnTier 7	-0.07%	-0.87%	53.59%			17%
Average year-to-year relative returnTier 8	20.33%	22.79%	14.78%	-16.46%	-41.11%	-3%
Average year-to-year relative returnTier 10	-58.83%	-12.10%				-32%

This is confirmed when we look at the "winners" in each period. Tier 1-4 is represented 8 times in table 37 below, whereas tier 5-10 is represented 7 times. A small victory but if tier 5 is left out as this is the middle tier tier 1-4 would win 8-6.

Table 37

	Period 2	Period 3	Period 4	Period 5	Period 6
Ranked 1	Tier 8	Tier 6	Tier 7	Tier 1	Tier 2
Ranked 2	Tier 3	Tier 1	Tier 1	Tier 3	Tier 5
Ranked 3	Tier 7	Tier 8	Tier 8	Tier 4	Tier 4

This result is the opposite of what was found in the absolute return analysis. Furthermore it is in contrast to what theory would predict. What table 37 shows is that growth stocks (tier 1,2 and 3) has outperformed value stocks (tier 7,8 and 10) in the analysed period.

It also show that companies who consider their share price undervalued based on long term growth prospects (growth shares) performed better than companies who based their undervaluation on short term earnings (value shares). But the difference to the absolute return analysis where the results were opposite is not possible to explain.

Conclusion on the relative return analysis.

Overall the relative return analysis confirmed the results from the absolute return analysis. The median relative return was negative in all periods when measured on aggregate data. This confirms the notion that companies who perform share buybacks do not add value to the shareholders. In contrast to the absolute return the average return was also negative in all

periods except period 6. Instead of adding value for shareholders, companies in general actually destroys value for shareholder, and shareholders would be better of selling short the companies who conduct share buybacks and hedge the position with a long position in the benchmark. This is true when looking at both the average return and the median return.

In fact 14% of the sample buybacks had negative returns in all periods which seems like a very poor judgement on whether your share is undervalued or not. Furthermore the return from period to period seems random which could indicate that the success of a buyback (a positive relative return) has nothing to do with the company's ability to conduct buybacks.

My analysis of the company size as a determinant confirmed the results from the absolute return analysis. Larger companies performed better than smaller companies. This result is again in contradiction with international studies but should perhaps be seen in the context that even large size Danish companies are small size in international comparison.

The price-to-book analysis however showed the opposite of what was found in the absolute return analysis. Relatively growth shares performed better than value shares. This is a major contradiction to international studies. No plausible explanation can be found for this result.

Finally my analysis showed that even though the general market development had been removed by using relative returns, the returns on buybacks still showed signs of correlation to the general market. One possible explanation for this could be that companies conducting share buybacks have higher financial gearings than the general market. This explanation has however not been tested as it is out of scope for this thesis.

Overall the relative return analysis has shown that institutional investors will find it difficult to earn money on share buybacks. As the results of both the market size and price-to-book ratio analysis is contrary to what theory suggests I am very reluctant to draw any conclusions on these findings.

Conclusion and comparison

In this section I put together my conclusions from the absolute and relative return analysis and draw an overall conclusion on my finding.

Furthermore I compare my findings with previous studies.

Overall conclusion

My analysis of the companies ability to create value for the shareholders through share buybacks showed that in general this is not the case.

The average company, as measured by the median return) had negative absolute returns in most periods analysed. Only in the short period up until the first update of the financial statements had the average company a positive return. This finding suggests that when companies evaluate their own share price they do so on the basis of the upcoming earnings which they believe will beat the market's expectation. On this subject companies on average seem to have some superior ability as indicated by the positive median return for period 1 of 1.4%. There were however an example of a company earning -40% in the same period which shows that not all companies has this ability. The median relative return for period 1 was however -1,52% so even though companies earned a positive return on their share buybacks in this period investors would have been better off if the company had paid dividends instead of conducting the share buyback. This way investors could have invested the money in the general market and earned a higher return.

My analysis of the development of the return showed that the vast majority of buybacks could not be classified as either good (earning a return above the median) or bad (earning a return below the median). Most buybacks had some periods with a return above the median and some periods with return below the median. This shows that in general it is not possible to classify companies as being either good or bad at conducting share buybacks. A few exceptions were found where companies had a return above the median in the majority of periods but it was not possible to identify these companies beforehand such that investors could take advantage of this.

The general perception that companies do not create any shareholder value through share buybacks was confirmed in the relative analysis. When comparing to the absolute return the median relative return was even lower. The median total relative return for all periods

between 1 and 5 years were negative hence investors would have been better of receiving cash is dividends and investing them in the general market.

I further analysed two determinants which international studies had shown to have significance for the return earned on the share buyback.
My analysis showed that the size of the company was positively correlated to both the absolute and relative return. This is in contradiction to previous studies which found the smaller companies outperformed larger companies. The explanation for the international evidence is that smaller companies typically are less analysed and thus a larger undervaluation might exists. For this explanation to be applicable to Danish companies would require two things.

- First, large size Danish companies were considered small size in international standards and small size Danish companies were too small to even have international investors.
- Secondly international investors are the main driver for the price development on the Danish stock market.

If this requirements are true then my findings about the company size is in accordance with international evidence. Whether this is true or not is out of scope for this thesis to test.

The evidence on the significance of the price-to-book ratio was mixed. I find that for absolute returns companies with a low price-to-book ratio had higher returns than companies with a high price-to-book ratio. This is in accordance with international evidence as a low price-to-book ratio can be a measure of an undervalued share price. The findings were however not confirmed by the relative return analysis as companies with high price-to-book ratios outperformed. It has not been possible to find any explanation for these mixed results.
With regard to price-to-book ratios is was surprising to find that 79% of all the buybacks in my sample was conducted by companies in tier 1-3, meaning companies with a relatively high price-to-book ratio. The opposite would have been expected if the price-to-book ratio is a good measure of an undervalued share price.

This can either be explained in two ways.

- Either Danish companies is in general in very capital intensive industries and a high price-to-book ratio does therefore not reflect a true undervaluation of the share.

- Or the motives of Danish companies for conducting share buybacks are not to take advantage of an undervalued share price.

The conclusion that share buybacks do not create any value for the shareholders is quite surprising. As the premises of this thesis was that companies conduct share buybacks in order to take advantage of an undervalued share price the findings questions this premises. Either companies are worse at evaluating their own share price than outside investors (as indicated by the absolute return) or their motives for conducting share buybacks are different than expected. This thesis cannot reject that Danish companies conduct share buybacks for motives which does not include adding value for the shareholders. Maybe companies conduct share buybacks in order to change their capital structure and thus do not care about the subsequent share performance – or maybe they do so in order to enhance the earnings per share and thus add value for management's option programmes?

Whatever the reason the findings of this thesis suggest that shareholders should take caution when allowing management to conduct share buybacks. In most cases shareholders would be better off having the excess cash distributed to them as dividends instead.

Comparing to previous studies

As mentioned in the methodology section prior studies have used abnormal returns to evaluate the success of share buybacks. This makes a direct comparison to my results impossible. Yet some comparison is possible.

In general prior studies find a positive abnormal return associated with share buybacks. Ikenberry *et al (1995)* find an average 4 year abnormal return of +12,1% for all shares and +45,3% for value shares (low price-to-book) for US shares in the period of 1980-1990. They later repeat the study for the period 1991-2001 and finds a average abnormal return of 24,25% for all shares and 28,89% for value shares.

De Ridder (2009) finds a 3 year abnormal return of +36,64% for Swedish shares and Skjeltorp (2004) finds a similar return of 11% for Norwegian shares.

Zhang (2005) calculates a 3 year abnormal return of 21% for Hong Kong shares.

Thus a picture shows that at least a positive abnormal return should be expected. As this studies have been conducted on different markets and in different periods it is very likely that

had they calculated absolute or relative returns as done in this thesis they would also have shown a positive return. Hence my results from the Danish market fits ill with international evidence. Further research into why this inconsistence exists is needed in order to find answers.

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