Signals from the financial crisis

- A study based on the effects of dividends signaling during the financial crisis on the Swedish Stock Exchange

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Abstract:

The purpose of our study was to analyze how dividend signaling effects the share price return on the Swedish Stock Exchange during the financial crisis and to see if the effects of dividend signals differ between four different sectors. We found that the effects of dividend signals were in accordance with the signaling theory before and after the financial crisis for three out of the four sectors. During the financial crisis dividend signals lost its significance amongst all sectors. In addition to that, signaling effects of dividend changes differ between of the sectors as one of the four sectors was not in accordance with the signaling theory after the financial crisis.

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1. Introduction

The purpose of this study is presented along with our two research questions in this section.

Firms listed on the Swedish stock Exchange in 2012 will pay dividends in the excess of 130 billion SEK to their respective shareholders (Placera, 120320). Dividend payouts are a common method applied by firms in order to return capital to shareholders. Dividend signals to the market that the business operations of a firm are functioning well and the management expects future growth in earnings. Dividend signals also send or communicate information from insiders to outsiders. This is possible due to asymmetric information where certain information is private therefore information asymmetry occurs when the management has more information concerning a firm than the public, creating an imperfect market (Bhattacharya, 1979). Dividend payouts can therefore be utilized in order to communicate information from management (insiders) to the public (outsiders). Alterations in dividends in the form of an increase or decrease can lead to significant price changes in the stock price (Chin-Bun, 2005). In the recent financial crisis the Swedish Stock Exchange decreased by approximately 37 % in 2008-2009 (Nasdaqomxnordic, 120502).

The crisis that originated in the US subprime mortgage market started to show its effects in the credit markets in 2007 and in March 2008 the investment bank Bear Stearns collapsed (CNN, 120510). The OMX30 peaked at approximately 1003 points in June 2008 (Nasdaqomxnordic, 120502). It was however not until the collapse of yet another investment bank Lehman Brothers in September 2008 that triggered the financial crisis and is often referred to as the beginning of the worst financial meltdown since the Great Depression (CNN, 120510). Along with the world’s stock markets OMX30 plunged to below 600 points in the end of 2008 (Nasdaqomxnordic, 120502).

1.1 Problem description

Information is not evenly distributed amongst individuals (economic agents) due to asymmetric information. Managers of a firm have greater knowledge concerning a firm than outsiders and can chose to communicate such information by sending signals to outsiders by different means, such as dividend signaling.

Dividend signaling concerns the signal communicated by dividends from a firm to the market regarding future cash flow projection. These signals affect the share price either positively or negatively dependent upon the dividend signal the market has received. Previous studies on the American markets have shown that changes in dividends have a positive correlation to
share prices (Asquith and Mullins, 1983, Bhattacharya, 1979 and Chin-Bun, 2005). These signals are possible due to the existence of asymmetric information (Bhattacharya, 1979 and Ross, 1977). Previous studies have however not investigated the effects of such dividend signals during a financial crisis like the one experienced during 2008-2009 in Sweden. Therefore it is possible that such signals do not have the same impact as the share prices could be influenced by other factors. Likewise it is possible that sectors are affected differently by changes in dividend payouts during the financial crisis. Our purpose is therefore to study such effects on the Swedish Stock Exchange.

1.2 Research question and purpose
The research questions of this study will be:

- How do dividend signals affect share prices in different sectors during a financial crisis?
- Do the effects of the signals differ between different sectors during a financial crisis?

The purpose of this study is to see if signals to the market concerning dividend changes have the same effect on share prices in different sectors during a financial crisis on the Swedish Stock Exchange.
2. Theoretical Framework

The following section presents the three forms of market efficiency, previous research, the signaling theory and the analytical model applied in this study.

2.1 The efficient market hypothesis

Efficient market hypothesis, hereafter EMH, has been subjected to economic research for several decades. One of the most well-known papers within the field defines market efficiency as a market that adjusts quickly to new information (Fama, 1965). If the market is efficient, the share price of a stock should always reflect the present value of a firm’s future cash flow (Fama et al, 1969 and Kothari, 2001).

Further research on the subject has differentiated the market into three forms of efficiency categorized by the effect, speed and precision in the adjustment of new information by the market (Fama, 1970). The three different forms of market efficiency are the following:

In Weak-form efficiency the current share price mirrors all the historic price information. Under this form, when all historical information is available to the market, technical analysis cannot be applied to generate excessive returns on capital (Bodie, Kane and Marcus, 2010).

Semi-strong efficiency is weak-form efficiency however in this EMH form all public information is available to the market. Insiders do still have the possibility to generate excessive return on their capital (Bodie et al, 2010).

Strong-form efficiency is weak- and semi-strong efficiency except in this EMH form all insider information is available to the public. Share prices therefore reflect all private and public information and under this EMH form no return higher than the market return is possible (Bodie et al, 2010).

If strong-form efficiency exists, share prices would reflect the fundamental value of the firm at all times. Therefore under this (strong form) EMH state all information is available to the market and already reflected in the stock prices therefore no excessive return on capital or higher return than the market can be generated. In weak-form efficiency analyzing historical data such as ex-dividend history of firms would be useless since this information would already be incorporated in the share price (Shostak, 1997).
“A blindfolded monkey throwing darts at a newspaper’s financial pages could select a portfolio that would do just as well as one carefully selected by the expert” (Malkiel, 1985 pp: 22).

This quote explains that in a market where strong efficiency exists, it does not matter how much information a person has concerning a firm as it is already reflected in the share prices.

The efficient market hypothesis is a naive and inadequate concept. The share prices do not adjust instantaneously on new information as stated by EMH; it is more of a process where the share prices adjust towards a fundamental value. This process is created by two types of investors, information arbitrageurs and noise traders. The information arbitrageurs (often professional fund managers) trade on fundamental information and the profession continues to exist and outperform the market indexes. This leads to the fact that arbitrageur opportunity continues to exist in various degrees. The other type of investor is the noise traders (ordinary traders); they trade on daily information that may be value irrelevant. These two forms of traders can explain, to some degree, why share prices can deviate from its fundamental value (Lee, 2001).

The nonexistence of a strong form of the efficient market hypothesis is essential for dividend signals to have an impact on share prices and for asymmetrical information to exist. With the strong form of efficient market hypothesis asymmetrical information does not exist and dividends signals will have zero impact on the share price (Shostak, 1997 and Grossman and Stiglitz, 1980).

2.2 Previous research
Miller and Modigliani were two economists that contributed many papers to the research field concerning dividends. Miller and Modigliani (1961) mentioned that dividend payouts are irrelevant under the assumptions mentioned below:

- Perfect capital markets (costless and equal information among all shareholders).
- Rational behavior (which mainly means that investors always will act rationalized and always prefer more wealth to less)
- Perfect certainty

This theory states that dividends are irrelevant, under the assumptions mentioned above, due to the fact that dividend changes are already reflected in the share price and buyers can sell a portion of their shares and receive cash instead (Miller and Modigliani, 1961).
However, this theory has been criticized by many researches due to the fact that the assumptions do not represent a realistic market. Previous formal economic models concerning decision making were constructed with the assumption of no information asymmetry. Given the imperfections relating to information, markets with slight information imperfection would act in the same manner as markets with perfect information. Contrary to the results of previous economists Stiglitz (2002) showed that even a slight amount of information imperfection can have a significant effect on the market.

Dividend payouts are utilized by firms in order to provide a ‘’signal’’ to the market concerning their future cash prospects. Bhattacharya (1979) assumes in his paper that outside investors have imperfect information (asymmetric information) in terms of firms profitability and that capital gains are taxed at a lower rate than dividends. Under such assumptions or conditions, dividend payouts signal information to the outside investors concerning future cash flows. Ross (1977) found similar evidence in his paper.

Asquith and Mullins (1983) provided empirical support concerning dividend signaling in their paper, ’’The impact of Initiating Dividend Payments on Shareholders Wealth’’. Their study is based upon historical data on the American Stock Exchange including 168 firms that paid dividends to their shareholders under a ten year period, 1954-1963. Of these firms, 114 firms increased their dividend payouts, 47 firms did not change their dividends and the last seven firms decreased their payouts. The result of Asquith and Mullins in their study is consistent with previous research regarding dividend signaling where share price returns are correlated positively with changes in dividends. They further mentioned that a firm’s dividend policy is of importance to the investors as the market reacts strongly and positively if the firms increase their dividends from year to year generating a positive impact for shareholders. Their result is in accordance with the semi strong efficiency of the efficient market hypothesis.

Like Asquith and Mullins (1983) Hakansson (1987) stated in his paper “to pay or not to pay dividends” that dividends served no purpose as a source of information to the market if the market has strong efficiency (perfect capital market). However under weak and/or semi-strong efficiency (imperfect market) Hakansson found that dividends may serve as a source of information to the investors and have the capability to improve efficiency.

Ofer and Siegel (1987) in their paper “Corporate Financial Policy, Information, and Market Expectations: An Empirical investigation of Dividends” found a positive relationship between
unexpected changes in dividends policy and share prices. They found that changes in dividends policy affected the firm’s earnings forecasts and future valuations of firms. Their findings support the hypothesis that unexpected changes in dividends signal information about a firm’s performance to the market. They performed their study on the NYSE and AMEX markets that contained over 2000 firms. The study collected data from 1976-1984, the earnings and dividends data were collected from CRSP daily master.

Aharony and Swary (1980) conducted a study to find if quarterly dividend changes communicated more information than that presented already by quarterly earnings. Aharony and Swary presented evidence that both earnings announcements and quarterly dividends can be seen as signals communicating the future prospects of a firm. They conducted their research upon 149 industrial firms listed on the New York Stock Exchange. As dividend figures and quarterly earnings figures are to a large extent made available to the public at the same period in time, the researchers examined earnings announcement and quarterly dividend made public on different dates. The sample data was divided into three categories of: increases in dividends, decreases in dividends and no changes in dividends.

The results from the study conducted presented three conclusions, namely, (i) firms that did not alter their dividend policy earned only normal returns, (ii) firms that increased their dividend payouts earned abnormal returns and (iii) firms that decreased their dividend payouts earned negative abnormal returns. Aharony and Swary (1980) in their findings concerning dividend announcements found supporting evidence where dividend changes communicated information concerning the management’s expectations of the future cash flows of the firm. Differentiating quarterly dividend announcements from quarterly earnings numbers provided evidence that dividend announcements communicated valuable information more than that already presented by quarterly earnings numbers. Their results are also in accordance with Asquith and Mullins (1983) who advocate for the semi-strong form of efficient capital market being a necessity for signaling to serve as a mean of communicating information from the management of a firm to the outsiders.

2.3 The signaling theory
The signaling theory was put forth first by Michael Spence (1973) where the theory was applied to the labor market to display the signaling function concerning education. Potential employers do not have the information concerning the quality of the job applicants. The applicants therefore attained education in order to signal their quality as well as reduce
asymmetric information (Certo, Conelly, Ireland and Reutzel, 2011). This is a reliable signal due to the fact that lower quality applicants would not be capable to cope with the academic demand of higher education. It is therefore a way to communicate unobservable characteristics of the job applicants. Financial economists on the other hand have demonstrated several examples on such general relationships. They have proposed that firm debt as well as dividends signify signals concerning the firm quality (Ross, 1973 and Bhattacharya, 1979).

Fundamentally signaling theory concerns how one can reduce information asymmetry that exists between two parties. This is of importance as the decision making processes applied by firms, governments and individuals is affected by information. Individuals base their decisions upon public information that is available as well as private information only available to a certain part of the public (Certo et al, 2011).

2.3.1 Dividends
Dividends are a term most commonly applied to describe cash distributions of firms’ earnings. In general, dividends are any direct payment from a firm to the shareholders. The most common method how cash is distributed between the firms and shareholders is by dividends and generally occurs once per year (Bodie, Kane and Marcus, 2005).

The advantages of dividends appeal to investors that desire continuous cash flows and do not want transaction costs related to selling shares. Investors are also able to meet present consumption requirements if they lack self control by purchasing high dividend shares. Firms may pay dividends in order to limit cash for bondholders and increase dividends in order to signal or communicate their confidence in future cash flows. Additionally the board of a firm may decide to pay dividends in order to decrease the amount of cash available to spend on managers. The disadvantages of dividends are that they are taxed generally in the same manner as income, therefore reducing the capability of a firm to self finance projects and decreases in dividends negatively affect the firms share price (Berk and DeMarzo, 2007).

2.3.2 Signaling theory of dividends
Substantial amount of information is communicated by dividend changes. Firms are inclined to increase dividends when cash flows in the future are deemed to be adequate to sustain the higher rate of dividend payouts and decreased likewise when management expectations concerning future cash flows are deemed insufficient to maintain the present dividend payouts. Managers are limited in regards to public statements they can make concerning the
firm’s ability to generate future earnings. In addition to that, reported earnings may vary due to random factors from normal earnings and market participants may not be able to differentiate the effects of such random factors. Therefore a firm’s management may utilize dividend payouts as a method to communicate their expectations concerning a firm’s earning power as well as liquidity and communicate information that is new as well as significant (Petit, 1972).

2.4 The Signaling Model
The signal model illustrates the primary elements of the signaling theory. There are two primary actors, the signaler as well as the receiver. The model also depicts the signal as well as the feedback to the signaler. These four elements are described in detail below.

2.4.1 Signaler
The signaling theory states that signalers are insiders such as managers or executives that obtain information concerning a product, individual or an organization not accessible to outsiders (Koch and Sun, 2004). In other words, insiders obtain information that is positive as well as negative that outsiders would find useful. Such information can contain early results from research-and-development activities or information relating to sales results. Insiders are also able to obtain information concerning other aspects of an organization, such as union negotiations or pending lawsuits (Certo et al, 2011).

2.4.2 Signal
Insiders obtain both negative as well as positive private information and therefore must take a decision as to whether to communicate such information to outsiders (Koch and Sun, 2004). Signaling theory emphasizes to a large extent on the deliberate and intentional communication of positive information in order to communicate positive organizational characteristics. Some studies have on the other hand examined decisions taken by insiders where negative information has been communicated to outsiders. It is important to mention however that these negative signals communicated to outsiders are not done so with a view to decrease asymmetric information but as a consequence of insider’s action (Certo et al, 2011). Dividends can decrease information asymmetry. By returning earnings of a firm through dividends, insiders do not have the capability to utilize such earnings for their personal benefit. Dividends (a bird in the hand) are superior to retained earnings (a bird in the bush) as the latter is not assured to materialize as future dividends (can fly away) (Silanes, Vishny and Shleifer, 2000).
2.4.3 Receiver
Receivers are outsiders that do not have information concerning an organization and would benefit from obtaining such information. Signalers and receivers have at the same time conflicting interests in the sense that successful deceit or manipulation would be of benefit to the signaler at the cost of the receiver (Certo et al, 2011). This theoretical assumption is similar to agency cost where there is a conflict of interest amongst insiders (managers) and outsiders (minority shareholders). Insiders or managers of a firm can take certain steps which are of benefit to them however detrimental to outsiders. More specifically, such steps can be of when insiders utilize firm assets for their personal benefit or excessive salaries. Signaling can therefore have a strategic effect (Certo et al, 2011).

2.4.4 Feedback
Receivers can send feedback in order to assist more efficient signaling in the form of countersignals. The primary assumption is that information asymmetry operates in two ways; receivers require information concerning signalers whereas signalers require information concerning receivers in order to assess the signals that are the most dependable in terms of which signals the receivers pay the most attention to and how such signals are interpreted. Signalers that observe such countersignals are able to adjust future signals in order to improve their communication to the receivers (Certo et al, 2011).

Figure 1 – The Signaling Model
This model demonstrates the timeline for signaling where each header (Signaler, Signal, Receiver and Feedback) of the boxes is further explained under the figure. Note: t=time.

2.5 Analytical model

The theories and previous research presented indicate that a change in a firm’s dividend payouts communicates signals to the market concerning the future income of a firm. This is a possibility due to the non existence of a strong-efficiency market and therefore the existence of asymmetrical information between the insiders within the firm and the outsiders (the market). Due to such information we have adjusted a model based upon the signaling theory model. This model will be applied to the selected sectors in order to study the effects of dividend signals during a financial crisis. The model consists of the following four parts;

- Firms (signaler): The firms have information concerning their dividend policy that the market is not aware of.
- Dividend payouts (signal): The signal is communicated by the firms to the market by changes in dividend payouts.
- The market/shareholders (receiver): The receiver of the dividend signals is the market that interprets the signals sent from the firms.
- Change in share price (feedback): The feedback that is sent back to the firms is the effect the dividend change has on the share price of the firms.

*Figure 2 – The analytical model*

This model demonstrate the timeline for signaling where $t = \text{time}$ and each header (Firms, Dividends, Stock-Market and Share price).

<table>
<thead>
<tr>
<th>Firms</th>
<th>Dividends</th>
<th>Stock-Market</th>
<th>Share price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms have (inside) information concerning dividends</td>
<td>Firms send signals through dividend payouts</td>
<td>The market observes and interprets the signals</td>
<td>Feedback from the market is sent back to the firm through changes in share price</td>
</tr>
</tbody>
</table>

$t = 0$ $\quad t = 1$ $\quad t = 2$ $\quad t = 3$

The focus of our analysis will be based upon the differences between changes in dividend payouts (signal) and the change in share price (feedback) in the various sectors during the time period of our study. Small differences between the dividend payouts and the change in share price indicate that the firm’s dividend signals as well as the feedback from the market
are aligned. This enables for the possibility to analyze if firms dividend signals are effective during the financial crisis and the possibility to analyze the differences between the sectors.

3. Method

The following section presents the operationalization of our study and this section is divided into data acquisition, time frame, stock market choice, calculations and criticism.

3.1 Data acquisition

The data required for this research was the availability of dividend payouts in percent, market values and the average yearly return of the Swedish Stock Exchange. We collected the historical data through Thomson and Reuter’s database, Datastream. As our objective was to analyze the entire Swedish Stock Exchange, it was required to collect the data concerning dividends from all the firms listed on the market. Certain firms have more than one stock listed on the market, referred to as one “A” stock and one “B” stock. The difference between an “A” stock and a “B” stock is that the former has greater voting rights. After electing to disregard all the “A” stocks for firms that had more than one stock listed on the Swedish Stock Exchange, our sample consisted of 501 firms (all the firms are listed in accordance to the respective industry they operate within under table 1). We preferred to disregard the “A” stocks as it is generally not traded at the same consistently as the “B” stocks.

Thereafter the firms were separated into four sectors where the criterion for the inclusion of the firms in the respective sectors was dependent upon the sector they operate within. The firms were divided into four different sectors as it provided us the possibility to analyze potential differences in the signaling effect between the sectors. The four distinctive sectors were Banks and Financials, Retails, Industrials and IT and Telecom (see table 1). These sectors included 224 of 501 (sample) firms and 20 of the 30 firms listed on OMXS30 (Nasdaqomxnordic.com 120502). From the 224 firms, ten firms in each sector were selected in order to construct a final sample that reflected the entire market significantly. The firms in each respective sector were chosen according to two criteria’s; (1) firms with the highest dividend yield in each sector and (2) had dividend payouts during the majority of the time period of our study. For example, if a firm had the highest dividend yield one year but no dividend payout during the rest of the time period, the firm was not included in our final sample. This process gave us a final sample of 40 firms, ten in each sector.
If data for some firms was missing we collected their specific data from another reliable source, Nasdaqomxnordic. The final sample of the firms is illustrated in table one below:

<table>
<thead>
<tr>
<th>Bank and Financials</th>
<th>Retail Goods</th>
<th>Industrials</th>
<th>Telecom and IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDUSTRIVARDEN</td>
<td>BILIA</td>
<td>ATLAS COPCO</td>
<td>AXIS</td>
</tr>
<tr>
<td>INVESTOR</td>
<td>CLAS OHLSON</td>
<td>BEIJER ALMA</td>
<td>ENEA</td>
</tr>
<tr>
<td>KINNEVIK</td>
<td>ELOS</td>
<td>G &amp; L BEIJER</td>
<td>HIQ INTERNATIONAL</td>
</tr>
<tr>
<td>LUNDBERGFORETAGEN</td>
<td>FENIX OUTDOOR</td>
<td>HOLMEN</td>
<td>MSC KONSULT</td>
</tr>
<tr>
<td>NORDEA BANK</td>
<td>GETINGE</td>
<td>NCC</td>
<td>NOVOTEK</td>
</tr>
<tr>
<td>ORESUND INVESTMENT</td>
<td>HENNES &amp; MAURITZ</td>
<td>PEAB</td>
<td>ORC GROUP</td>
</tr>
<tr>
<td>RATOS</td>
<td>KABE HUSVAGNAR</td>
<td>SKANSKA</td>
<td>PREVAS</td>
</tr>
<tr>
<td>SEB</td>
<td>NEW WAVE GROUP</td>
<td>SSAB</td>
<td>TELE2</td>
</tr>
<tr>
<td>SHB</td>
<td>SCA</td>
<td>TRELLEBORG</td>
<td>TELIASONERA</td>
</tr>
<tr>
<td>SWEDBANK</td>
<td>SECTRA</td>
<td>VOLVO</td>
<td>VITEC</td>
</tr>
</tbody>
</table>

3.2 Time frame
We collected the data for the time period 2006 to 2010, a period of four years. The decision concerning the time period and the reason for its extension to two years before and one year after the financial crisis was due to the fact that it provided us the possibility to study the signaling effects of dividends in different market conditions. In addition to that, it also enabled us to analyze if the financial crisis had an effect on the dividend signals and compare it to the other years included in our study.

We required a data sample that is recent, reliable and preferably available through DataStream and by selecting the respective years the data required was available. The previous mentioned was the primary reason for the date being set to year 2006 for data collection in order to assemble a sample before, during and after the financial crisis. This resulted in a four year period where we considered the data gathered sufficient under different market conditions in order to perform our study.
3.3 Stock market choice
The data collected and the calculations were compared with a market index. We selected to compare our portfolios return against the OMX_PI All share, hereafter OMX_PI that included all the Swedish firms listed on the Swedish Stock Exchange including the markets First North, Aktietorget and MGN. The rationale behind our choice of index is that it covered all the stocks our sample was selected from which made it more relevant to our study than other indexes like OMX30 that only incorporates the 30 most traded stocks on the Stockholm Stock Exchange. This provided us with the opportunity to include firms of different sizes in our data sample and includes additional firms with dividend payouts.

It is reasonable for us to assume that the number of investors following the Swedish Stock Exchange is fewer than foreign markets, such as the American equivalent due to its size. This could have consequences on the effects of the signals on the market, the market efficiency and therefore implications on the evaluation of the different firm’s dividends and return on capital. This is of importance as it differentiated our study from previous studies and enabled us to contribute in the field of research.

In addition to that, OMX_PI is a price index meaning that dividends are not reinvested; this is relevant to our study as our calculations do not include reinvested dividends. If we instead compared with an index that reinvested dividends that index would have had a higher market return in relation to OMX_PI making our comparison with a portfolio that does not reinvest dividends misrepresentative. All assets in the market, from real estate to stamp collections should be included when the market return is calculated, making it impractical to examine therefore OMX_PI was used as an approximation for the market.

3.4 Calculations
In order to calculate the dividend in percent, we divided the dividend in SEK by the share price at the 1st of June in order to establish the firms with the highest dividend yield. This calculation was repeated at 1st of June every year during our time period. The process of dividend payouts to the shareholders is initiated by the management of a firm proposing how much dividends should be paid. The proposition is voted upon at the annual general meeting where it is decided how much dividends should be paid to the shareholders. Shortly thereafter the dividends are paid to the shareholders. We selected the date 1st of June as the whole process concerning dividend payouts has already taken place (from the initiating process to
when the dividend is paid). The effect of such is that the signal from dividends is already sent regardless if it was sent during the announcement date, at the annual general meeting or at the date of the dividend payout.

The formula used for calculating dividend yield is presented below:

\[
\text{Dividend yield} = \frac{\text{Annual dividend per share}}{\text{Price per share}}
\]

Thereafter we analyzed how the share price developed, for the firms in table 1, yearly during the period 2006-2010. This was achieved by looking at the share price at the 1st of June and dividing it by the share price at the 1st of June the previous year for the respective firms. This process was repeated each year until 2010 and the formula for the calculation is presented below:

\[
\text{Share price in percent} = \left( \frac{\text{Share price 1st of June, } t = 1}{\text{Share price 1st of June, } t = 0} \right) - 1
\]

\[ t = \text{time} \]

The size of the firm has importance for the portfolios return therefore the return of the portfolio was calculated in accordance to value weighting, hereafter VW. This signifies that each firm in the portfolio is weighted according to their market value once per year from 2006-2010. The market value is acquired as per the 1st of June from Datastream. We selected to calculate our portfolios with VW as the market index is VW. If we did not VW our portfolios, the smallest and the largest firms, according to market value, would have affected the portfolio equally (Brown and Schuck, 1997).

3.5 Criticism of our data
By VW our data we faced a problem that certain firms with higher market value would have affect the return on the portfolios more than firms with lower market value as our portfolios did not include all the firms in OMX.PI.

As far as our data collection is concerned, the information was collected through Datastream however at times limited. We observed that certain firms had unrealistic dividend yield, such as Eniro and therefore required to be excluded from our sample. The reasoning behind such unrealistic data can be caused by extreme drops in share prices and splits that have effected calculations conducted by Datastream.
Certain firms that have, during our time period, gone into the liquidation process or reintroduced on the exchange have been excluded from our calculations. If the share price return from such firms differed from the market return, the results could have been distorted. As we selected to only include firms that were listed during the entire period 2006-2010 when constructing the portfolios, firms that had been going public on the Swedish Stock Exchange or that were delisted during our time period have been excluded. Such firms (delisted) could have had lower share price return in comparison to the market in our time period. It is also possible that some excluded firms had a higher share price return in relation to the market return however it is not possible to comment upon which direction the potential distortion occurred.

The result of the study was affected by the size of our sample and that the sample was not statistically significant. As our sample was limited to 10 firms representing each sector, conclusions are to be taken bearing such a fact in mind. Since the study was focused on dividend changes and the signals it communicated, we have taken into consideration that other published information not mentioned in this study may have influenced the result of this study.

There are numerous ways as to how a study can be demonstrated to have high reliability. For example, one can conduct a survey to the same group at two different times or with certain intervals. If the results are the same, it is an expression of high reliability (Johanessen and Tuffe, 2003). It is of our opinion that the result of our study is of high reliability as it examines historical data from the Swedish Stock Exchange. The data is available and accessible to the public, therefore possible for it to be verified.
4. Results

The following section presents the collected data. All the portfolios share price return and dividend changes in each sector are presented separately, sector by sector.

A total of 40 firms in four different sectors are presented in this section with ten firms within each sector. In each section the noteworthy observations are highlighted and stated in the form of bullet points. The firm specific return on share price is not presented in this section however it is available in the appendix (see table 7-10). For detailed information concerning which firms are included in each sector see table 1 in section 3.1.

4.1 Before the financial crisis

Table 2– Return and dividend changes from 2006-2007

The subsequent table demonstrates the changes during 2006-2007 concerning the return as well as dividends in percentage for each of the four sectors.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Financials</td>
<td>37,1</td>
<td>14,1</td>
<td>23</td>
</tr>
<tr>
<td>Industrials</td>
<td>74,3</td>
<td>27,2</td>
<td>47,1</td>
</tr>
<tr>
<td>IT and Telecom</td>
<td>26,3</td>
<td>22,8</td>
<td>3,5</td>
</tr>
<tr>
<td>Retails</td>
<td>38,9</td>
<td>12,5</td>
<td>26,4</td>
</tr>
<tr>
<td>OMX_PI All share</td>
<td>36,1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The observed result in table 2 above shows that the Banks and Financial sector portfolio has increased the return with approximately 37 % from 1st of June 2006 to 1st of June 2007. The dividend for this sector during the same period increased with approximately 14 %. The difference between the observed return and dividend is 23 %. In the Industrial sector portfolio the return increased by 74,3 % during the period while the dividend increase was 27,2 %: In this sector the difference was 47,1 % between the return and dividend. The IT and Telecom sector had the lowest return of all the four sectors with a total return of 26,3 % and a dividend increase of 22,8 %. At the same time this sector had the lowest difference between dividend and Portfolio return (3,5 %). The Retail sector had a return of 38,9 % while the dividend increase was 12,5 %. The difference in this sector was 26,4 %, the second highest difference between return and dividend, second to the Industrial sector (47,1 %)

- Industrials difference between portfolio return and portfolio dividend
IT and Telecom difference between portfolio return and portfolio dividend

Table 3 – Return and dividend changes from 2007-2008
The subsequent table demonstrates the changes during 2007-2008 concerning the return and dividends in percentage for each of the four sectors.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Financials</td>
<td>– 27</td>
<td>– 30,1</td>
<td>3,1</td>
</tr>
<tr>
<td>Industrials</td>
<td>– 32,9</td>
<td>– 30,2</td>
<td>– 2,7</td>
</tr>
<tr>
<td>IT and Telecom</td>
<td>1,5</td>
<td>2,3</td>
<td>– 0,8</td>
</tr>
<tr>
<td>Retail</td>
<td>– 16,8</td>
<td>– 35,3</td>
<td>18,5</td>
</tr>
<tr>
<td>OMX_PI All share</td>
<td>– 24,1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

During the period 1st of June 2007 until 1st of June 2008 three out of four sectors have experienced a negative return on their portfolios which can be observed in table 3 above. The Banks and Financial portfolio decreased with approximately 27 % and the dividend decreased with 30,1 %. The difference between return on portfolio and dividends was during the same period 3,1 %. The Industrials had the highest decrease on the share price with 32,9 % and the second highest decrease in dividends with 30,2 %. This gives a difference between the portfolio return and dividends of -2,7 %. IT and Telecom was the only sector that had positive return during this period, the return on portfolio was 1,5 % and the dividend increased by 2,3 %. IT and Telecom also had the lowest difference between dividend and portfolio return of -0,8 %. The last sector, Retail return decreased by 16,8 % where as the dividends had the highest decrease in comparison with the other sectors approximately by 35 %. The difference between dividends and return on share price is 18,5 %.

Retails difference between portfolio return and portfolio dividend
4.2 During the financial crisis

Table 4 - Return and dividend changes from 2008-2009

The subsequent table demonstrates the changes during 2008-2009 concerning the return and dividends in percentage for each of the four sectors.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Financials</td>
<td>−29,4</td>
<td>0,4</td>
<td>−29,8</td>
</tr>
<tr>
<td>Industrials</td>
<td>−35,2</td>
<td>6,8</td>
<td>−42</td>
</tr>
<tr>
<td>IT and Telecom</td>
<td>−29,5</td>
<td>44,7</td>
<td>−74,2</td>
</tr>
<tr>
<td>Retails</td>
<td>−7,7</td>
<td>12,3</td>
<td>−20</td>
</tr>
<tr>
<td>OMX_PI All share</td>
<td>−22,4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

During the period 1st of June 2008 until 1st of June 2009 all four of the sectors experienced a negative return. Autumn of 2008 when the effects of the financial crisis upon the stock market were at its peak is covered in this period, as stated in the introduction. During this period all of the sectors raised their dividends. The sector IT and Telecom raised their dividend by 44,7 % from the previous period while the return dropped by -29,5 %. The total difference in this sector between the return and dividend is -74,2 % which is the highest difference amongst all sectors. The return of the Retail portfolio was the least affected of all sectors with a decrease of -7,7 % while the dividend increased by 12,3 %. The difference between the return and dividend -20 % and was the lowest of all the sectors during this period. The Industrial sector had the highest drop in return of the sectors with a -35,2 % decreased while the dividend increased by 6,8 %. The difference was the second highest with -42 %. The Banks Financial sector altered their dividends (0,4 %) while their return declined with -29,4 %. The difference between the return and dividend was -29,8 %.

- IT and Telecom difference between portfolio return and portfolio dividend
4.3 After the financial crisis

Table 5 - Return and dividend changes from 2009-2010

The subsequent table demonstrates the changes during 2009-2010 concerning their return and dividends in percentage for each of the four sectors.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Financials</td>
<td>16,6</td>
<td>20,3</td>
<td>-3,7</td>
</tr>
<tr>
<td>Industrials</td>
<td>-42,9</td>
<td>15,8</td>
<td>-58,7</td>
</tr>
<tr>
<td>IT and Telecom</td>
<td>26,9</td>
<td>21,9</td>
<td>5</td>
</tr>
<tr>
<td>Retails</td>
<td>34,7</td>
<td>65,8</td>
<td>-31,1</td>
</tr>
<tr>
<td>OMX PI All share</td>
<td>23,4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

During the period 1st of June 2009 until 1st of June 2010 three of the four sectors had positive return and all sectors increased the dividends. The Industrial sector was the only sector with a negative return of -42,9 % while the dividend increased with 15,8 %. The difference between the return and dividend was -58,7 %. Retails had the second highest difference concerning return and dividends (-31,1 %). Both return and dividends experienced a positive increase where as the difference between the two was that the dividends were higher (65,8 %) than the share price (34,7 %). The Banks and Financial sector as well as the IT and Telecom sector had lower differences between their increase in return and changes in dividends in comparison to the other two sectors. The Banks and Financials difference was -3,7 % where as the return increased with 16,6 % and the dividend increased with 20,3 %. The IT and Telecom sector had the second lowest difference with 5 %, where the return increased with 26,9 % while the dividend increased with 21,9 %.

- Industrials difference between portfolio return and portfolio dividend
- Retails difference between portfolio return and portfolio dividend
4.4 Return on portfolios and dividend changes, sector by sector

*Figure 3 – Chart of the Banks and Financial sectors return and dividend changes*

The subsequent figure shows the Banks and Financial sector share price return as well as changes in dividends in comparison to OMX_PI during the period of 1\textsuperscript{st} of June 2006 until 1\textsuperscript{st} of June 2010.

In figure 3 as illustrated above the share price return follows the same trend as the dividend changes until the financial crisis (2008-2009) where the share price proceeds to decrease while the dividends of the sectors increased. From 2009-2010 the share price return and dividend changes started to follow the same trend again. When comparing the share price return and OMX_PI, the two follow the same trend throughout the entire period.

*Figure 4 – Chart of the Industrial sectors return and dividend changes*

The subsequent figure shows the industrial sector share price return and changes in dividends in comparison to OMX_PI during the period 1\textsuperscript{st} of June 2006 until 1\textsuperscript{st} of June 2010.

In figure 4 as illustrated above the share price return follows the same trend as the dividend changes until the financial crisis (2008-2009), where the share price return continues to decrease while the sectors dividend changes increased. The same trend proceeds throughout 2009-2010 between the share prices return and dividend changes. OMX_PI and the share
price return follow the same trend until 2009-2010 where OMX_PI increased while the share price return decreased.

*Figure 5 – Chart of the Retail sectors return and dividend changes*

The subsequent figure shows the industrial sector share price return and changes in dividends in comparison to OMX_PI during the period 1st of June 2006 until 1st of June 2010.

In figure 5 as illustrated above the portfolio share price return follows the same trend as the dividend changes until the financial crisis (2008-2009), where the share price return continues to decrease while the sectors dividend changes increased. The following year 2009-2010 the share price return increased as did the dividend. When comparing OMX_PI to the portfolio share price return they follow the same trend throughout the time period.

*Figure 6 – Chart of the IT and Telecom sectors return and dividend changes*

The subsequent figure shows the IT and Telecom sectors share price return and changes in dividends in relation to OMX_PI during the 1st of June 2006 until 1st of June 2010.

In figure 6 as illustrated above, the share price return follows the same trend as the dividend changes until the financial crisis (2008-2009), where the share price return continues to decrease where as the sectors dividend changes increased. The following year 2009-2010 the
share price return increased as did the dividend. When comparing OMX_PI to the portfolio share price return they follow the same trend until 2007-2008 where the share price return in the portfolio increased while OMX_PI decreased. After that period they started following the same trend.

5. Analysis and Discussion

In this section the analytical model adjusted from the theories will be applied to the different sectors and time periods and thereafter the effects will be discussed.

5.1 Analysis 2006-2008 (before the crisis)
During the time period 2006-2007 all the sectors increased their dividend payouts. This signaled to the market that the future potential earnings should be able to sustain higher dividend payouts from the firms to the shareholders. This is also reflected in the sectors share price resulting in an increase. As shown in table 2, all the four sectors share price return increased which together with the increase in dividend payouts supports the theory that the signals from changes in dividends has an effect on the market.

During the observed time period 2007-2008 as shown in table 3 three of the four sectors, Banks and Financial, Retails as well as Industrials decreased their dividend payouts. In these three sectors the return on share price of all portfolios was negative. In the remaining sector IT and Telecom the dividend payouts increased and at the same time the sector return on share price was positive. These results also indicate that changes in dividends, signals have an effect on the market during this time period.

5.2 Analysis 2008-2009 (during the crisis)
The effects of the financial crisis can be observed during the period 2008-2009. As shown in table 4 all the sectors, Banks and Financials, Industrials, IT and Telecom and Retails increased their dividend payouts. During the same period all the sectors share price return decreased. These results differ from the previous time period (2006-2008) where an increase in dividend payouts was followed by an increase in share price return and vice versa which supported the signaling theory. However during the financial crisis these effects have disappeared and an increase in dividend payouts have not been followed by an increase in the share price return for the four sectors. This indicates that the signaling effect from dividend changes lost its significance on the market or the effects have decreased where as other factors have mitigated the signaling effects during the financial crisis for all four sectors.
The Retail sector had the lowest difference between the share price return and the dividend change, thereby the highest alignment between signal and feedback. The reason for such was the fact that the sector signaled to the market an increase in dividend payout while its share price return decreased less than all the other sectors during the financial crisis. IT and Telecom had the highest difference between their dividend change and share price return. The sector had the highest dividend change while the share price return decreased, thereby the lowest alignment amongst the four sectors. The two other sectors, Banks and Financials and Industrials signaled either no changes in dividends (Banks and Financials) or a small increase (Industrials). The difference between the dividend change and the share price return came therefore almost solely from a decrease in the sectors share price.

The industry (Retail) had the lowest difference between the share price return and the dividend change and thereby the highest alignment between signal and feedback. The reason for this was that the sector signaled the market a dividend payout increase while its share price return decreased less than all the other sectors during the financial crisis. To the contrary, IT and Telecom had the highest difference between their dividend change and share price return and thereby the lowest alignment of the four sectors. This sector (IT and Telecom) had the highest dividend change while the share price return decreased. The other two sectors, Banks and Financials and Industrials both signaled either no dividend changes (Banks and Financials) or a small increase (Industrials). The difference between the dividend change and the share price return came therefore almost solely from a decrease in the sectors share prices.

5.3 Analysis 2009-2010 (after the crisis)
During the last observed period 2009-2010, as shown in table 5, all the four sectors, Banks and Financials, Retail, IT and Telecom and Industrials increased their dividend payouts. Only one of these four sectors, Industrials had a decrease in share price return during the same period. The other three sectors recovered from the decrease during the financial crisis and had an increase in their share price return. These three sectors increase in dividend payouts and increase in share price return supports the signaling theory. The difference between the share price return and the dividend changes in the Industrial sector do not support the signaling theory as the dividend payouts increased while as the return on share price decreased. The last sector, Industrials, difference between share price return and dividend changes does not
support the signaling theory as the dividend payouts increased where as the return on share price decreased, further discussed in section 5.4. The results indicate that dividend signaling has an effect on three out four sectors during this time period.

Table 6 – Signaling effects on the four sectors
The green ticks in the table shows when the dividend signaling effects are in accordance with the signaling theory. The red symbol shows when the dividend signaling effects are not in accordance with the signaling theory.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Financials</td>
<td>✓</td>
<td>✓</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td>Industrials</td>
<td>✓</td>
<td>✓</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>IT and Telecom</td>
<td>✓</td>
<td>✓</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td>Retails</td>
<td>✓</td>
<td>✓</td>
<td>–</td>
<td>✓</td>
</tr>
</tbody>
</table>

5.4 Analytical discussion
The empirical data in our study shows that three of the following sectors, Banks and Financials, Retails, IT and Telecom follow in accordance with the dividend signaling theory during the years before and after the financial crisis however not during it. The remaining sector (Industrials) is in accordance with the dividend signaling theory before the financial crisis however deviates from it during and the year after.

A possible explanation for the failure of the signaling theory during the financial crisis could be that the theory does not include other factors that can influence a business sector or in other words, the theory holds all other factors constant. For example, these four sectors could have been affected to various degrees during a period of crisis and during different market conditions. Three out of the four sectors, Banks and Financials, Industrials and IT and Telecom had negative share price return in comparison with OMX_PI during the financial crisis indicating that these three sectors share price return decreased more than the average return on the market. This also signifies that such sectors are more affected by uncertainty in the market during the times of a financial crisis than the signals the firms communicate to the market. The only sector that had positive return (abnormal) in comparison with OMX_PI was the Retail sector which indicates that this sectors return was higher than the average return on the market.

In addition to the above mentioned, another possible explanation as to why certain sectors increased dividends while the share prices decreased during the financial crisis could be that the management of a firm would like to ease the fears of the investors surrounding the long term future of a firm. As Aharony and Swary (1980) present in their paper, both earnings
announcements and quarterly dividends can be seen as signals communicating future prospects of a firm. During a financial crisis, it is probable that firms experience negative growth and a decrease in revenue may be reflected in their quarterly reports signaling a weaker future outlook. The management therefore could in order to ease some of the fear created by such financial reports and figures increase dividends in order to send a positive signal to the investors concerning the future of a firm and to affect the firm’s earnings forecasts and future valuations of firms (Ofer and Siegel, 1987). Dividend signaling can therefore be applied to communicate signals as the outside investors do not have access to the same information (asymmetric information) as the management of a firm due to the semi strong form of EMH (Bhattacharya, 1979 and Asquith and Mullins, 1983). Additionally, dividends serve as a source of information to the investors and have the capability to improve efficiency Hakansson (1987). The firms may therefore during a financial crisis increase dividends to signal information to the investors.

To the contrary, agency costs can explain why managers may act in their personal interest. Miller and Modigliani (1961) assume that there is no conflict of interest amongst shareholders and managers. This assumption in practice is however debatable as the interests of managers may not be the same as the interests of shareholders. Managers might be short term oriented and base their decisions upon their personal interest. Such decisions can be detrimental to the firm and an example can be of when the management utilizes the assets of a firm for excessive salaries.
6. Conclusion and future research

The following section concludes our study and provides suggestions for future research.

The purpose of this study was to investigate how the effects of dividend signaling differed between firms within different sectors during the financial crisis with the following two research questions:

- How do dividend signals affect share prices in different sectors during a financial crisis?
- Do the effects of the signals differ between different sectors during a financial crisis?

We found that the effect of dividend signaling in the three sectors (Banks and Financials, IT and Telecom and Retails) was in accordance with the signaling theory during 2006-2008 and 2009-2010. The Industrial sector was in accordance with the signaling theory during 2006-2008 however to the contrary, it was not in accordance with the signaling theory during 2008-2010. Considering the above mentioned, we can draw the conclusion that the effects of dividend changes are in accordance with the signaling theory (in the majority of the periods observed). However the signaling effects of dividend changes are not in accordance with the signaling theory during the financial crisis. Therefore the effects of dividend signaling are minimized or mitigated during a financial crisis. In addition to that, signaling effects of dividend changes differ between the sectors as the Industrial sector was not in accordance with the signaling theory during 2009-2010 where as the other three sectors were. This can be due to other factors which the signaling theory holds constant.

Our conclusion supports previous research that signaling to the market with dividend changes is an effective way to communicate information concerning firm’s future earnings (Asquith and Mullins, 1983, Bhattacharya, 1973 and Siegel and Ofer, 1987). However our contribution is that the effects of signaling through dividend changes are mitigated or minimized during a financial crisis. Furthermore we found that the signal and feedback alignment differed between the sectors during the financial crisis. However this had no impact on the signaling theory as the effects of the signals had been mitigated or minimized.

It is important to understand that there are limitations to the study we performed. The sample used to represent the different sectors was relatively small which decreases the reliability of the study and the sample was selected on pre determined criteria however our result supports previous research. In addition to that, our study is based upon a phenomenon observed in the past therefore there continuously exists a doubt whether it will persist in the future and
therefore affecting the applicability of the study. Our analytical model based on the signaling theory holds other factors constant or in other words, it does not consider other factors that may influence the share price of a firm. The methodology selected could have affected the result of our study. This includes the criteria upon which the firms in each sector were selected from and the time period. We have attempted to neutralize such by working in accordance with previous research.

During the process of our study, several questions surfaced that could be of interest for future research. One suggestion is to do a similar study on other markets to see if the results are dependent on other factors that the signaling theory holds constant, such as market size, geographical and/or cultural factors. Another interesting aspect is to study these effects on other crisis that did not originate within the financial and real estate sector, such as the IT crash to see if dividend signaling losses its effect there as well. A future study could also divide each sector into subgroups in order to see if there are certain kind of firms whose dividend signaling are affected more by a crisis than others.
**References**


Chin-Bun, Tse., 2005, Use dividends to signal or not: an examination of the UK dividend payout patterns, *The Managerial Finance*. Vol. 31 No. 4 pp: 12–33

CNN, 2012


Nasdaqomxnordic, 2012


Placera, 2012


Appendix

*Table 6 - All firms in the Banks and Financial sector*

In the Banks and Financial sector Ratos had the highest share price return during the observation period and Swedbank had the lowest return.

<table>
<thead>
<tr>
<th>Banks and Financials</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INDUSTRIVARDEN</strong></td>
<td>100,0</td>
<td>143,7</td>
<td>98,5</td>
<td>70,5</td>
<td>87,3</td>
</tr>
<tr>
<td><strong>INVESTOR</strong></td>
<td>100,0</td>
<td>142,0</td>
<td>115,7</td>
<td>95,1</td>
<td>99,0</td>
</tr>
<tr>
<td><strong>KINNEVIK</strong></td>
<td>100,0</td>
<td>151,8</td>
<td>145,7</td>
<td>100,6</td>
<td>138,4</td>
</tr>
<tr>
<td><strong>LUNDBERGFORETAGEN</strong></td>
<td>100,0</td>
<td>132,1</td>
<td>95,3</td>
<td>85,8</td>
<td>94,9</td>
</tr>
<tr>
<td><strong>NORDEA BANK</strong></td>
<td>100,0</td>
<td>130,4</td>
<td>109,2</td>
<td>89,5</td>
<td>92,7</td>
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<tr>
<td><strong>ORESUND INVESTMENT</strong></td>
<td>100,0</td>
<td>147,5</td>
<td>95,8</td>
<td>86,5</td>
<td>98,1</td>
</tr>
<tr>
<td><strong>RATOS</strong></td>
<td>100,0</td>
<td>202,7</td>
<td>177,8</td>
<td>141,3</td>
<td>176,9</td>
</tr>
<tr>
<td><strong>SEB</strong></td>
<td>100,0</td>
<td>133,6</td>
<td>74,2</td>
<td>43,5</td>
<td>55,9</td>
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<td><strong>SWEDBANK</strong></td>
<td>100,0</td>
<td>135,2</td>
<td>75,2</td>
<td>25,0</td>
<td>44,4</td>
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<td><strong>SVENSKA HANDBKN</strong></td>
<td>100,0</td>
<td>103,8</td>
<td>82,5</td>
<td>75,9</td>
<td>96,2</td>
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<td><strong>PORTFOLIO</strong></td>
<td>100,0</td>
<td>137,1</td>
<td>100,0</td>
<td>70,6</td>
<td>82,3</td>
</tr>
</tbody>
</table>

*Table 7 - All firms in the Retail sector*

Most of the firms in the Retail sector had a negative share price return in comparison with the portfolio return. Fenix Outdoor has the highest return and New Wave Group the lowest return.

<table>
<thead>
<tr>
<th>RETAILS</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BILIA</strong></td>
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<td>48,8</td>
<td>27,8</td>
<td>75,1</td>
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<td><strong>CLAS OHLSON</strong></td>
<td>100,0</td>
<td>102,3</td>
<td>69,0</td>
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<td>87,1</td>
</tr>
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<td><strong>ELOS</strong></td>
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<td>202,8</td>
<td>127,1</td>
<td>162,2</td>
</tr>
<tr>
<td><strong>FENIX OUTDOOR</strong></td>
<td>100,0</td>
<td>104,4</td>
<td>112,9</td>
<td>120,1</td>
<td>244,2</td>
</tr>
<tr>
<td><strong>GETINGE</strong></td>
<td>100,0</td>
<td>122,3</td>
<td>126,1</td>
<td>77,7</td>
<td>134,4</td>
</tr>
<tr>
<td><strong>HENNES &amp; MAURITZ</strong></td>
<td>100,0</td>
<td>154,8</td>
<td>127,8</td>
<td>127,0</td>
<td>168,3</td>
</tr>
<tr>
<td><strong>KABE HUSVAGNAR</strong></td>
<td>100,0</td>
<td>86,9</td>
<td>66,1</td>
<td>32,1</td>
<td>63,3</td>
</tr>
<tr>
<td><strong>NEW WAVE GROUP</strong></td>
<td>100,0</td>
<td>100,9</td>
<td>47,4</td>
<td>20,8</td>
<td>44,4</td>
</tr>
<tr>
<td><strong>SCA</strong></td>
<td>100,0</td>
<td>103,1</td>
<td>88,9</td>
<td>69,6</td>
<td>84,7</td>
</tr>
<tr>
<td><strong>SECTRA</strong></td>
<td>100,0</td>
<td>123,3</td>
<td>99,2</td>
<td>64,7</td>
<td>62,0</td>
</tr>
<tr>
<td><strong>PORTFOLIO</strong></td>
<td>100,0</td>
<td>139,0</td>
<td>115,7</td>
<td>106,8</td>
<td>143,8</td>
</tr>
</tbody>
</table>
### Table 8 - All firms in the Industrial sector

The Industrial sector includes four firms with abnormal return in comparison with the portfolio return and the firm with the highest return is G & L BEIJER. Six firms have share price return lower than the portfolio and Holmen has the lowest return.

<table>
<thead>
<tr>
<th>INDUSTRIALS</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLAS COPCO</td>
<td>100,0</td>
<td>138,8</td>
<td>125,7</td>
<td>93,1</td>
<td>129,8</td>
</tr>
<tr>
<td>BEIJER ALMA</td>
<td>100,0</td>
<td>166,7</td>
<td>118,9</td>
<td>126,7</td>
<td>158,5</td>
</tr>
<tr>
<td>G &amp; L BEIJER</td>
<td>100,0</td>
<td>221,8</td>
<td>205,3</td>
<td>196,5</td>
<td>224,1</td>
</tr>
<tr>
<td>HOLMEN</td>
<td>100,0</td>
<td>104,2</td>
<td>69,3</td>
<td>63,9</td>
<td>61,8</td>
</tr>
<tr>
<td>NCC</td>
<td>100,0</td>
<td>113,0</td>
<td>64,7</td>
<td>43,2</td>
<td>67,1</td>
</tr>
<tr>
<td>PEAB</td>
<td>100,0</td>
<td>201,7</td>
<td>132,6</td>
<td>91,9</td>
<td>99,6</td>
</tr>
<tr>
<td>SSAB</td>
<td>100,0</td>
<td>180,6</td>
<td>152,0</td>
<td>80,5</td>
<td>83,6</td>
</tr>
<tr>
<td>TRELLEBORG</td>
<td>100,0</td>
<td>149,1</td>
<td>75,6</td>
<td>42,8</td>
<td>71,5</td>
</tr>
<tr>
<td>VOLVO</td>
<td>100,0</td>
<td>215,9</td>
<td>136,1</td>
<td>73,7</td>
<td>119,5</td>
</tr>
<tr>
<td>SKANSKA</td>
<td>100,0</td>
<td>143,2</td>
<td>88,9</td>
<td>75,8</td>
<td>101,1</td>
</tr>
<tr>
<td>PORTFOLIO</td>
<td>100,0</td>
<td>174,3</td>
<td>117,0</td>
<td>75,8</td>
<td>108,4</td>
</tr>
</tbody>
</table>

### Table 9 - All firms in the IT and Telecom Sector

The IT and Telecom sector has generally performed badly during the observation period. ORC group had the highest return in comparison with the portfolio return and MSC Konsult the lowest.

<table>
<thead>
<tr>
<th>IT and Telecom</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXIS</td>
<td>100,0</td>
<td>288,1</td>
<td>168,7</td>
<td>125,9</td>
<td>184,4</td>
</tr>
<tr>
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<td>100,0</td>
<td>94,8</td>
<td>56,0</td>
<td>49,6</td>
<td>60,2</td>
</tr>
<tr>
<td>HIQ INTERNATIONAL</td>
<td>100,0</td>
<td>103,9</td>
<td>86,5</td>
<td>79,5</td>
<td>98,5</td>
</tr>
<tr>
<td>MSC KONSULT</td>
<td>100,0</td>
<td>81,4</td>
<td>78,4</td>
<td>36,7</td>
<td>47,4</td>
</tr>
<tr>
<td>NOVOTEK</td>
<td>100,0</td>
<td>111,8</td>
<td>74,5</td>
<td>56,4</td>
<td>55,0</td>
</tr>
<tr>
<td>ORC GROUP</td>
<td>100,0</td>
<td>368,0</td>
<td>213,6</td>
<td>259,7</td>
<td>301,0</td>
</tr>
<tr>
<td>PREVAS</td>
<td>100,0</td>
<td>169,9</td>
<td>120,1</td>
<td>97,6</td>
<td>100,0</td>
</tr>
<tr>
<td>TELE2</td>
<td>100,0</td>
<td>151,0</td>
<td>161,5</td>
<td>98,7</td>
<td>145,8</td>
</tr>
<tr>
<td>TELIASONERA</td>
<td>100,0</td>
<td>113,5</td>
<td>119,0</td>
<td>85,8</td>
<td>103,6</td>
</tr>
<tr>
<td>VITEC</td>
<td>100,0</td>
<td>93,5</td>
<td>81,9</td>
<td>94,5</td>
<td>154,5</td>
</tr>
<tr>
<td>PORTFOLIO</td>
<td>100,0</td>
<td>126,3</td>
<td>128,2</td>
<td>90,4</td>
<td>114,8</td>
</tr>
</tbody>
</table>