Stockholm School of Economics
Department of Finance
Bachelor's Thesis
Spring 2014

# How Good Are Analysts at Handling Crisis?
## *- A Study of Analyst Recommendations on the Nordic Stock Exchanges during the Great Recession*

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***Abstract***

The purpose of this thesis is to gain better understanding of the value of analyst recommendations. We show, by studying analyst consensus recommendations on four Nordic stock exchanges that during the Great Recession analysts' ability to generate profitable stock recommendations declined. The abnormal profit of the stocks with favorable consensus recommendations declined during the crisis, at the same time as that of the stocks with the least favorable consensus recommendations increased and became positive. We use value weighted portfolios, which are rebalanced weekly, and examine their benchmark-adjusted return and alpha, applying the Fama-French three factor model. The implication for investors is that they should be careful when adhering to analyst recommendations in extreme market conditions, since the economic environment will affect the quality of the recommendations. This result also suggests that a price drift caused by the recommendations themselves, rather than analysts' ability to predict future returns, could explain any abnormal profit generated by following analyst recommendations. Furthermore, we discuss if the positive abnormal profit from the stocks with least favorable recommendations could be explained by the *flight-to-safety* phenomenon, which appeared during the crisis, since these stocks are characterized by higher book-to-market values.

**Keywords:** analyst recommendations, analyst performance, the Great Recession, flight-to-safety

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**Acknowledgements:** We would like to thank our tutor Irina Zviadadze for providing us with valuable information and guidance.

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# I. Introduction

In this thesis we examine the profitability of following analysts' consensus recommendations during the Great Recession in comparison to a reference period, thereby analyzing how the quality of analysts' stock recommendations is affected by relatively extreme market conditions. We study Nordic stocks listed on stock exchanges in Sweden, Finland, Denmark and Norway, during the time period 2003 to 2013.

Whether analysts are better informed and can give profitable stock recommendations or not is a topic that has been debated and discussed in the academic literature and the financial world during a long period of time. It is a topic where the opinions of academic researchers and the financial industry diverge; although there is no complete and uniform consensus, researchers generally invoke the efficient market hypothesis and claim that investors should not be able to profit from trading on public information. The research departments of brokerage houses evidently disagree, since they spend large sums of money at analyzing firms, to be able to give good stock recommendations to their customers. Therefore we think analyst recommendations and their investment value is an interesting subject to investigate. One can note that most of the previous research within this area focus on the effect of analysts' recommendations and potentially profitable trading strategies during a certain, quite short, time period. An area that is relatively unexplored is how analysts' stock picking abilities are affected by the market conditions and the changes in the surrounding economic conditions. Therefore, it is an important and interesting area to study since it can reveal more characteristics that analyst recommendations have.

Earlier studies done in this area has been done over time periods with less extreme changes in the stock market. Gylling et al. (2008) look at analyst recommendations in bull and bear markets and observe that the probability of a portfolio performing better than the benchmark depends on if it is value or equally weighted. Wåghäll and Lystedt (2008) perform a similar study and find that analysts can find outperforming stocks in both bear in bull markets. Whether or not these results persisted during the financial crisis of 2008 has not yet been explored. Therefore it is difficult to pose hypotheses about the results of our study. To be able to pose a hypothesis regarding the results we need to do a slight review of the interpretations of previous research in this area. Overall it is possible to discern two different explanations as to the general results of previous research in this area, discussed by Jegadeesh et al. (2004) among others. The first explanation is that analysts can predict future returns of stocks, by analyzing qualitative aspects of firms and thereby capturing information that is orthogonal to other public information. These facts add value for investors and generate possible trading strategies for investors that give abnormal returns. However, since analyst recommendations are public information as well, the information they provide are incorporated into the market in ways that makes it impossible for investor to profit, if one takes transaction costs into account. The second interpretation is that analysts create a pressure on stock prices and a price drift by their recommendations. From this point of view the recommendations generate a form of price momentum by themselves, making them self-fulfilling prophecies. For example, if an analyst gives a favorable (unfavorable) recommendation of a stock, this information will make investors believe that stock is a good (bad) investment, which will generate an upward (downward) price pressure on that stock.

By using these two different explanations described above as a starting-point, it is slightly easier to make a reasonable conjecture about our results. If one believes in the first interpretation, that analysts can predict future returns, it is probable that due to the increased uncertainty during such a severe crisis as that of 2008, it will become more difficult to analyze firms and predict future returns. Hence should analysts' ability to provide profitable stock recommendations decline during the financial crisis according to this reasoning. If one believes in the second interpretation, that analyst recommendations create a price pressure on stocks, it is also probable that analysts' ability to provide profitable stock recommendations during the financial crisis would decline. This would be due to the fact that during the financial crisis much emphasis was put on macro-economic news and events, such as for example national debts and budget deficits and investors were perhaps so overwhelmed with these news, that they did not pay attention to analyst recommendations as much as they usually do. To conclude, our hypothesis is that analysts' ability to give profitable stock recommendations declined during the financial crisis, compared with the reference period.

In this study the financial crisis of 2008 is defined as the time period from January 1st 2008 to December 31st 2009. To fully capture the effect of the financial crisis, data from 2007 and 2010 respectively is excluded due to the effects that the financial crisis may have had on these years. As a reference period, we use recommendations given during the period 2003-2006 and 2011-2013. We form five value weighted portfolios in each of the four countries based on consensus recommendation, where portfolio 1 has the most favorable consensus recommendations and portfolio 5 has the most unfavorable consensus recommendations, and these portfolios are rebalanced on a weekly basis. To evaluate the performance of these portfolios, a weekly value weighted benchmark is created for each country, which is based on all stocks covered by analysts in that country. The weekly value weighted abnormal return is given by the difference between the weekly raw returns and the weekly benchmark. The average weekly abnormal return is compared over the different portfolios and time periods to gain an understanding of analyst performance. Thereafter we run a regression using the three-factor model developed by Fama and French (1993) to control for known risk factors and see if the results persist. The alphas generated by the portfolios during the two time periods are compared and to further check the robustness of our results we look at the kurtosis, skewness and standard deviations of the portfolios.

We find that during the reference period the portfolios perform in line with previous literature by for example Barber et al. and Gylling et al. The portfolios with the most favorable consensus recommendations, portfolio 1 and 2, both generate significantly positive average abnormal returns and alphas during the reference period. During the financial crisis on the other hand the results are different. Portfolio 1 still generates a positive average abnormal return and alpha, but both the magnitude and the significance have declined. Portfolio 2 produces a negative abnormal return and alpha, where only the abnormal return is significant. Portfolio 3 and 5 generate a slightly positive average abnormal return and portfolio 4 produces a slightly negative abnormal return, where all abnormal returns are insignificant. Surprisingly, portfolio 5 generates a significantly positive weekly alpha of 0.3 % during the crisis. Portfolio 3 and 4 generate insignificant alphas around zero. Turning to the differences between the time periods, we find that there are significant differences in the average abnormal return and the alpha of portfolio 2, which decrease during the crisis. There are also significant differences in the average abnormal return and in the alpha for portfolio 5, which increase during the crisis. Hence we conclude that our results suggest that analysts' ability to provide profitable stock recommendations was affected by the financial crisis, in a way that suggests that their ability substantially declined during the crisis.

The remainder of this thesis is organized as follows. In section II we provide a summary of previous research within this area and pose our hypotheses. In section III the data is described in detail, together with some descriptive statistics. The method we have used for this study is described in section IV and thereafter are our results presented in section V. To conclude, in section VI, we summarize and discuss our results.

# II. Theoretical Framework

**Previous Literature**

Many researchers have looked into the quality and effect of analyst recommendations during the last decades. Stickel (1995) looks at buy and sell recommendations issued within a time period from 1988 to 1991 and finds that brokerage houses' recommendations do affect stock prices, both in the short- and the long-term. When a brokerage house issues a buy (sell) recommendation for a stock an average abnormal return of 1.16 (-1.28) percent over the following 11 days is observed. This impact on stock prices is found to be augmented by the strength of the recommendation, the magnitude of the change in recommendation, the reputation of the analyst, the size of the brokerage house, the size of the recommended firm and the contemporaneous earnings forecast revisions. Of these factors only the strength of the recommendation, firm size and contemporaneous earnings forecast have a permanent price effect, which would suggest that these have information effects on the market.

The results found by Desai and Jain (1995) point in another direction. They have looked into the performance of stock recommendations made by so-called "superstar" money managers at *Barron's* Annual Roundtable, between 1968 and 1991. Every year *Barron's* invites eight to twelve successful money managers, which are those who are considered among the best in the business, to the Roundtable, where they give stock recommendations that are published in *Barron's* about 14 days later. Overall, their results suggest that the "superstar" money managers do not seem to possess superior skills in recommending stocks, although the results differs slightly between the managers buy and sell recommendations. They find that the abnormal return for the buy recommendations after the publication day with a 250-days holding period is not significantly different from zero. The sell recommendations, on the other hand, give a abnormal return of -8.12 percent over the same period.

In concurrence with Stickel's findings Womack (1996) finds that after an analyst has made a revision of a recommendation, where the recommendation is either changed to a strong buy and strong sell recommendation, the stock price adjusts either up 5 percent, for strong buy recommendations, or down 11 percent, for strong sell recommendations, over the next several months. Already after three days the size-adjusted mean return for the strong buy recommendations amounts to 3 percent and -4.7 percent for the strong sell recommendations, where the size-adjusted return is calculated by subtracting the return of the matching CRSP market capitalization size decile from the raw return. Womack also finds a large asymmetry in the proportions of buy and sell recommendations issued by the 14 major U.S. brokerage firms; the ratio of new buy to sell recommendations is approximately 7:1 during 1989-1991. He concludes that there is strong evidence that stock prices are significantly affected by changes in analysts' recommendations.

Barber et al. (2001) use a slightly different approach to examine the value of analysts' recommendations. They examine the abnormal return from purchasing (selling short) stocks with the most (least) favorable consensus recommendations, both gross and net of transactions costs. The authors create portfolios based on consensus recommendations and these portfolios are rebalanced on a daily basis. They analyze daily data collected from Zacks database for the period 1985 to 1996. They define abnormal return as the intercept when applying different versions of the CAPM, such as the Fama-French three factor model. The authors find that the portfolio that consists of the stocks with the most (least) favorable recommendations yield an annual abnormal gross return of 4.13 (-4.19) percent after controlling for market risk, size, book-to-market and momentum. After accounting for trading costs, they find that a trading strategy where the portfolios are rebalanced daily does not yield an abnormal net return reliably greater than zero. They conclude that the market shows a sort of semi-strong inefficiency, where investor would be able to profit from analyst recommendations absent transaction costs.

If indeed analysts can predict future returns, are there any other variables that capture this information and if so, which are they? These questions have Jegadeesh et al. (2004) looked into. They have studied which are the typical characteristics of the stocks with favorable and unfavorable recommendations and posed the question whether analysts add value after controlling for the return predictability of other signals. They find that after controlling for signals such as momentum, trading volume, valuation multiples, growth indicators, firm size and CAPEX, the marginal predictability of the level of analyst recommendations is not significant. On the other hand, changes in the consensus analyst recommendation do predict future returns. They propose two different explanations for this, which were discussed in section I; their first hypothesis is that analysts bring new information to investors through their recommendations, which is largely uncaptured by other signals. Their second hypothesis is that the changes in recommendation cause a price drift, by creating their own price momentum.

There are some disputes as to whether the consensus recommendation is the variable that have the best predictive power of future returns. McKnight and Todd uses earnings forecast revisions instead of recommendations to predict future returns of European stocks.

They find that the stocks with the greatest number of upward revisions in earnings, net of downward revisions, earn significantly higher returns. This difference is quite large; a portfolio consisting of the quintile of stocks with the highest number of net upward revisions outperforms a portfolio of the quintile of stocks with the lowest number of net upward revisions by more than 16 percent per year. This effect is statistically significant for seven out of the 13 European countries analyzed. In contrast to Barber et al., and Jegadeesh et al. they find that neither the average consensus recommendation nor changes in that metric are significant in explaining future stock returns.

How the predictive power of analyst recommendations is affected by different market conditions is a subject that has been touched upon by some researchers. Gylling et al. (2008) examine the existence of profitable trading strategies based on analyst recommendations and further they evaluate whether these results are robust over time, in different market conditions and across firms of different sizes. They use Swedish data from 2003 to 2008. Overall, the authors find evidence supporting that stocks with the most (least) favorable consensus recommendations outperform (underperform) their benchmark, before accounting for transaction costs. They use a method in line with Barber et al. (2001) where they generate daily-rebalanced portfolios, with the difference that they use equally weighted portfolios in addition to value weighted ones. As a robustness test, the authors look at analysts' performance in bear and bull markets, where they define markets as bull when the monthly sample benchmark is positive and bear markets when the benchmark is negative. The probability of each portfolio performing better or worse than the benchmark is given for both value and equally weighted portfolios in bull and bear markets. The authors find that using value weighted portfolios, there is a higher probability that portfolio 1 and 5 outperform the benchmark in bull markets than in bear markets. In contrast, they find that the probability of beating the benchmark increases for portfolio 2-4 if markets are bear. Somewhat contradictory, they find that using equally weighted portfolios, the probability of each portfolio performing better than the benchmark increases for all portfolios except for portfolio 3, if markets are bear. In conclusion, they find that the hold portfolio tends to underperform the benchmark in both market conditions and both weightings.

Another paper written by Wåghäll and Lystedt (2008) also analyzes how analyst recommendations differ depending on market conditions. They also study the existence of any profitable trading strategies looking at European stocks. The method used is similar to that used of both Barber et al. (2001) and Gylling et al. (2008), where they form weekly rebalanced portfolios based consensus recommendations. In addition to looking at trading strategies that yield a positive abnormal return, they also study how these trading strategies perform in bull and bear markets, where bull markets are defined as months when the benchmark index is rising and bear markets as when the benchmark index is falling. They find that analysts are able to pick winners both in bull and bear markets and also indications that analysts more accurately find winners in period with rising prices and losers in periods with periods with falling prices.

### Hypotheses

In the light of previous research we believe it is reasonable to pose the following hypotheses:

Hypothesis 1: Stocks with favorable (unfavorable) consensus recommendations will outperform (underperform) their benchmark and will generate positive (negative) alphas during the reference period.

Hypothesis 2: During the Great Recession stocks with favorable (unfavorable) consensus recommendations will perform worse (better) than during the reference period.

## III. Data Description

### Introduction to the Data

The data used in this thesis is from Thomson Datastream. The database is managed by Thomson Reuters, one of the biggest providers of current and historical financial statistics, covering international macroeconomics, equities, bonds, indices, commodities, exchange rates and derivatives. Thomson Reuters collects data from many different sources, including a large majority of the world's equity research houses. Hence the data should have high reliability and give a fair representation of analyst recommendations. The data used for our study are from January 1$^{st}$, 2003 to December 31$^{st}$, 2013. We use daily data from four different countries where the data consists of all the constituent stocks in the OMX Stockholm, OMX Helsinki, OMX Copenhagen Equity index and Olso Exchange All Share (Oslo Bors).

### Analyst Recommendations

In the database analysts' consensus recommendation is given as a number from 1 to 5, where 1 is a strong buy recommendation and 5 a sell recommendation. The consensus recommendation for a stock is computed by summarizing the recommendations from all analysts and dividing by the number of recommendations outstanding. There are currently 858 contributors from whom recommendations are collected. When an analyst makes or changes a recommendation, it will pass through a screening to make sure that the new recommendation does not differ greatly from the analyst's previous recommendation or the previous consensus view. Within a few hours a preliminary estimate will appear in the database and the consensus recommendation for that company is changed. The stock recommendations remain in the database during 180 days. If the recommendation have not been confirmed or updated within 180 days, it will be removed. In special cases Thomson Reuters may want to contact the analyst regarding a change in recommendations. This causes a small time delay, but since we use daily data during a time period of 11 years this fact should not affect the results to any great extent.

**Table 1.** Table 1 illustrates the meaning of the analyst consensus recommendations collected from Thomson Datastream.

| Value | Meaning |
|---|---|
| 1 - 1.49 | Strong buy |
| 1.5 - 2.49 | Buy |
| 2.5 - 3.49 | Hold |
| 3.5 - 4.49 | Underperform |
| 4.5 - 5 | Sell |

### Other Variables

To test our hypotheses we use, aside from consensus recommendations, daily data for stock prices, market values, market-to-book values, risk-free rates for the four different countries and the number of recommendations. The stock prices, market values and market-to-book values are in local currency and the closing stock price is used. As a proxy for the risk-free rate we have used four different interest rates, one for each country, since all the countries have different currencies. As the Danish risk-free interest rate the Discount Rate of Denmark is used, whereas for Sweden the Swedish Riksbank Repo Rate is used as the risk-free rate. The Finnish risk-free rate is approximated with the ECB Main Refinancing Repo Rate and the Norwegian with Norges Bank's Sight Deposit Rate. All the risk-free rates are recalculated as weekly risk-free interest rates.

### Descriptive Statistics

**Table 2** illustrates that the average number of firms is lowest in portfolio 1 and 5 during the full sample period with 34 and 83 firms respectively. The relatively low number of firms in portfolio 5 could be explained by the fact that analysts are reluctant to issue sell recommendations (Barber et al. (2001)). The low number of firms in portfolio 1 is a common phenomenon discussed widely and mentioned by for instance Barber et al. (2001) that come to the conclusion that a company must be small and have a low number of analysts following it to be able to get a strong buy recommendation. This seems to be a reasonable explanation in our case. For instance, **Table 3, 4 and 5** illustrate that the firms in portfolio 1 in Sweden, Finland and Norway respectively have the lowest average market value and average number of analysts covering them. In contrast, **Table 6** illustrating Danish firms shows a somewhat different pattern where portfolio 2 has the lowest average market value per company, but portfolio 1 still has the lowest average number of analysts covering it.

In Sweden, Norway and Denmark, portfolio 3 has the highest average market value and also the highest average number of analysts covering it (Table 3, 5, 6). This is consistent with previous findings that analysts tend to issue hold recommendations to a greater extent than strong buy or strong sell recommendations (Barber et al. (2001)). Furthermore, we can observe that portfolio 5 also consists of relatively small firms (Table 3 - 6). A potential explanation for this observation is that analysts are not only reluctant to issue sell recommendations overall but they are maybe more reluctant to issue sell recommendation for big firms than for small firms.

**Table 7** illustrates that the average and median consensus recommendations for the full sample is 2.56 and 2.5 respectively. Therefore they represent hold recommendations according to the definition of consensus recommendations in Datastream, see **Table 1**. This further strengthens previous findings that analysts tend to issue hold recommendations to a great extent (Barber et al. (2001)). Looking at the different countries we notice that the average and median recommendations in Finland are relatively high and the recommendations in Norway are relatively low during the entire sample period, suggesting that analysts had different views on these markets during our sample period. A pattern we observe for all countries is that both the average and median recommendations are lower in 2013 than in 2003, implying a more optimistic view on the market in 2013 in comparison to 2003. We also observe an increase in the average recommendation from 2008 to 2009 in all countries, which reflects the fact that the financial crisis created a more pessimistic view on the Nordic market.

**Table 8-11** display analyst coverage ratio of listed firms and market value in Sweden, Finland, Norway and Denmark, respectively.

**Table 8** shows that from 2003-2013, there was an increase in the percentage of the market value covered by analysts in Sweden, from 68.0% in 2003 to 91.6% in 2013. The number of covered firms as a fraction of listed firms also increases, from 56.5% in 2003 to

69.5% in 2013. In 2008 and 2009, the number of firms listed remained at a level of 259 firms, reflecting the fact that the financial crisis of 2008 did not encourage many new firms to go public. Furthermore, there is a decrease in the total and average market value of the covered firms from 2008 to 2009, also reflecting the presence of a crisis.

**Table 9** illustrates that the number of listed firms increased from 2008 to 2009 on the OMX Helsinki, in contrast to the number of listed firms on the Stockholm OMX, which remained unchanged, see **Table 8**. The fact that 65.1% of the listed firms represent 90.8% of the market value in 2013 reflects that there are a large number of small firms that are listed but not covered on the OMX Helsinki.

**Table 10** also shows an increase in the percentage of listed firms covered and the percentage of market value covered in Norway from 2003 to 2013. In comparison to OMX Helsinki, there are not as many small and uncovered firms listed on the Olso Exchange All Share, since 77.7% of the firms represent 91.8% of the market.

**Table 11** shows that from 2003 to 2013, there is a decrease in the percentage of listed firms covered but an increase in the percentage of market value covered, by 6.6 and 9.8 percentage points respectively.

**Table 12** illustrates the average book-to-market value for all portfolios separately by year and for the full sample period. Overall, we see that the average book-to-market value is highest for portfolio 5 and lowest for portfolio 1. This implies that analysts prefer growth stocks to value stocks, where growth stocks are defined as stocks with relatively low book-to-market ratio and value stocks as stocks with relatively high book-to-market ratio. This is consistent with the findings of Jegadeesh et al. (2004) that find that analysts tend to recommend growth stocks.

**Data Issues**

When selecting data, we have chosen to cover four countries where there are different numbers of stocks constituting each index, see **Table 8-11**. Because the number of firms covered in each country changes from year to year, the returns from each country respectively will weigh differently each year. This is because our results are to a large extent based on the average of returns from the four countries. The average implies that we have taken all observations into account and then divided by the total number of observations, not making any differences between the countries. This is something that will affect our results in a way that there will be a bias toward how analyst recommendations of Swedish stocks perform, since the majority of the observations are of those stocks.

Other issues are that we have excluded data that not only lack analyst coverage but also book-to-market value and market value. This implies that some stocks that are covered by analysts are not included, due to the lack of information from the database. This could potentially cause biases in our results if these stocks that are excluded lack information for the same reasons, for instance that they have the same characteristics. Therefore these characteristics are not taken into account in our dataset.

# IV. Method

To be able to evaluate the quality of analyst recommendations during different market conditions and make a comparison between analysts' performance during the Great Recession compared to a reference period, we first have to define what time period we refer to as the Great Recession.

**Definition of the Great Recession**

There is no universally acknowledged definition of when the financial crisis, also referred to as the Great Recession that took place at the end of the 2000's, actually started or ended. Of course that definition will depend on not only on which measures of economic activity you look at, but also the geographical region. We have chosen to define the financial crisis as the period between January 1st 2008 and December 31st 2009. The factors we have looked at when coming up with this definition of the crisis is the growth in GDP of the countries we cover in this thesis. At the beginning of 2008 all of the four countries covered were in recession and up until the end of 2009 the growth in quarterly GDP of these economies were mostly negative. During 2010 there was substantial recovery where the growth in GDP improved and became positive at some point in all countries covered.[3] Therefore we have chosen to define the financial crisis as 2008-2009. We would like to point out that we are not interested in the quality of analysts' stock recommendations during recessions per se, but rather how the quality is affected by severe market conditions in the financial markets. This financial crisis was not only characterized by a great downturn in measures of economic activity such as GDP growth and unemployment, but also a substantial dry-up in liquidity and a large drop of the prices in the financial markets.

Therefore we believe that one should be careful to draw general conclusions about analysts' ability in a smaller recession from our particular results. Furthermore, we exclude

[3] The information of growth in GDP is collected from the website, tradingeconomics.com, that provides historical data for economic indicators for 196 countries.

the transitions periods 2007 and 2010 to isolate and capture only the effect of the crisis. In other words, data from 2007 and 2010 are not included in the analysis due to the possible influences the financial crisis may have had on these years. Henceforth we refer to the reference period as time period 1 and the financial crisis as time period 2.

**Portfolio Construction**

To answer our research question we have used a strategy where all stocks in each country, which are covered by at least one analyst, are grouped into five different value weighted portfolios depending on the average recommendation, the consensus recommendation. We use value weighted portfolios because it allows for us to better capture the economic significance of the results obtained. This is because the returns of firms with a higher market value will weigh more heavily in the aggregate return than will smaller firms. A potential bias of value weighted returns may be that there is harder to find evidence of abnormal returns, as markets are likely to be more efficient for firms with higher market value (Barber et al. (2001)). Before constructing the value weighted portfolios, all stocks that lack analyst coverage, book-to-market value and market value are excluded. If a company would lack coverage during a specific time period, that company is excluded during that specific time period, otherwise it is included.

The limits for the consensus recommendations used when grouping stocks into portfolios can be viewed in the table below. The cutoffs are set so that only portfolio 5 contains stocks that have underperform and sell recommendations, see table 1. This is to obtain enough firms in that portfolio, because analysts rather issue buy and hold recommendations than sell recommendations (Stickel (1995) and Barber et al. (2001)). The other limits are set so that we achieve enough firms in each portfolio and gain sufficient power for our tests.

**Table 13.** The stocks are grouped into portfolios in accordance with the following limits.

| Portfolio | Limits for consensus recommendation (RECCON) |
|---|---|
| 1 | <=1.5 |
| 2 | 1.5 < RECCON <=2 |
| 3 | 2 < RECCON <=2.5 |
| 4 | 2.5 < RECCON <=3 |
| 5 | 3 < RECCON <=5 |

The portfolios are rebalanced weekly, so that if the consensus recommendation for a certain stock is changed in the middle of a week, it is moved to the new portfolio in the beginning of the next week. After grouping the stocks into portfolios we compute the weekly value weighted return from each portfolio. If one or several analysts start to follow a company in the middle of a week, that company is added to the portfolio in the beginning of the next week.

**Portfolio Returns**

The daily return from portfolio *p* on day *t* in country *c* is given by the equation below. We approximate the weight of stock *i* in the portfolio *p* by using the weight based on closing prices, hence the weight as of day *t*.

$$R_{pct} = \sum_{i=1}^{n} w_{ict} R_{ict}$$

where:

$R_{pct}$ = return of portfolio *p* on day *t* in country *c*
$w_{ict}$ = weight of stock *i* on day *t* in country *c*
$R_{ict}$ = return of stock *i* on day *t* in country *c*

To calculate the weekly returns from our portfolios we compound the daily value weighted returns during the week.

$$R_{pcw} = \prod_{t=1}^{n} (1 + R_{pct}) - 1$$

where:

$R_{pcw}$ = return of portfolio *p* during week *w* in country *c*

**Benchmark Returns**

To be able to see how the portfolios perform during the different time periods we need to relate their returns to an appropriate benchmark. We have chosen this benchmark as an index constructed from the stocks covered in this study. The reason for this is that these indexes reflect the overall performance of the markets in question in a fairly good way, since a large proportion of the market value is covered, see **Tables 8-11**. Because we have value weighted portfolios, the indexes we construct are value weighted as well. We generate four different value weighted indexes; one for each country, because each country has a different currency. Each index is constructed in the following way:

$$R_{bct} = \sum_{i=1}^{n} w_{ict} R_{ict}$$

where:

$R_{bct}$ = return of the index *b* on day *t* in country *c*
$w_{ict}$ = weight of stock *i* on day *t* in country *c*
$R_{ict}$ = return of stock *i* on day *t* in country *c*

We approximate the weight of each stock on day *t* by the ratio between the closing market value of the stock and the total market value in country *c*, both on day *t*. Compounding the daily returns from the benchmark during week *w* generates the weekly index benchmark.

$$R_{bcw} = \prod_{t=1}^{n} (1 + R_{bct}) - 1$$

where:

$R_{bcw}$ = return of the index *b* during week *w* in country *c*

**Fama-French Factors**

To be able to properly evaluate the performance of the five different portfolios we also need to generate the two Fama-French factors SMB and HML. We do this by sorting the stocks each day into two portfolios based on market value, where the stocks with a market value greater than the median of that day is put into one portfolio and the rest into another. We then sort the stocks into three other portfolios, also rebalanced daily, based on book-to-market value, where the 30th percentile and the 70th percentile are the breakpoints. We use these two groupings to form six new value weighted portfolios on a daily basis; big value stocks, big neutral stocks, big growth stocks, small value stocks, small neutral stocks and small growth stocks, see **Figure 1**. We use the six portfolios to generate the SMB factor by calculating the equally weighted average return of the three small portfolios minus the equally weighted average return of the three big portfolios.

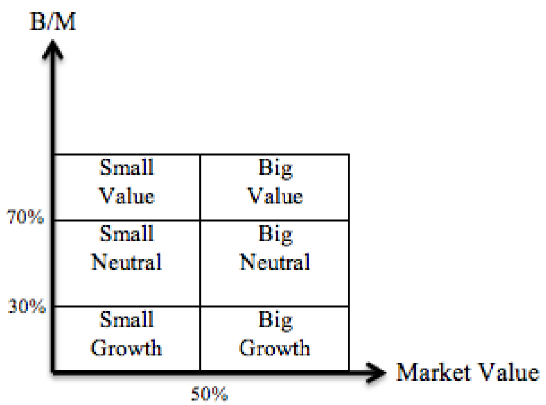
*SMB = 1/3 (Small Value + Small Neutral + Small Growth) – 1/3 (Big Value + Big Neutral + Big Growth)*

The HML factor is generated by calculating the equally weighted average return of the two high book-to-market portfolios minus the equally weighted average return of the two low book-to-market portfolios.

*HML = 1/2 (Small Value + Big Value) – 1/2 (Small Growth + Big Growth)*

When running our regression with the Fama-French factors, we have compounded the daily observations to weekly observations.

**Figure 1.** Figure 1 illustrates how the six different portfolios are created based on book-to-market value and market value.




**Performance Evaluation**

To evaluate whether the consensus recommendations of analysts add any value to investors during different time periods we need to calculate the abnormal return form each portfolio. The abnormal return is calculated by subtracting the weekly return of the benchmark index from the weekly value weighted return of each portfolio.

$$AR_{pcw} = R_{pcw} - R_{bcw}$$

where:

$R_{pcw}$ = return from portfolio *p* in country *c* during week *w*

$AR_{pcw}$ = abnormal return from portfolio *p* in country *c* during week *w*

$R_{bcw}$ = return from benchmark *b* in country *c* during week *w*

We compute an average weekly abnormal return for each portfolio and each time period by summing up all the observations of the abnormal return for portfolio *p* in all countries during that time period and dividing by the number of observations. This is referred to as the average weekly abnormal return for portfolio *p* during that time period.

**Hypotheses Testing**

All our statistical tests are based on our hypotheses (1) and (2) in Section II. Because we want to test whether portfolio 1 and 2 perform better than the market during the reference period, we conduct a hypothesis test where the null hypothesis is that the abnormal return (alpha) is equal to or less than zero. This is because we want to be able to reject this hypothesis for the hypothesis that the abnormal return (or alpha) is greater than zero. The same reasoning applies to portfolio 4 and 5, but with reversed signs. When conducting hypotheses tests on portfolio 3, we have the null hypothesis that it performs equal to the index. This is because we want to see if the middle portfolio (portfolio 3) performs significantly different from the market during the reference period. During the period of financial crisis, we want to test if analysts have any ability to generate abnormal returns (alphas) that are different from zero in either direction. Therefore the null hypothesis during this time period is that they perform equal to the benchmark. This applies for all portfolios. Because we have more than 30 observations, we can use the Central Limit Theorem when conducting our tests.

To see if the abnormal returns from each portfolio during the reference period are in line with what have been found in previous research we perform the statistical tests outlined below in **Table 14**. The average abnormal return is computed on data from period 1 only.

**Table 14**. Table 14 illustrates the hypotheses tests conducted on the abnormal returns of the portfolios during the reference period (period 1).

| Portfolio | $H_0$ | $H_1$ |
|---|---|---|
| 1 & 2 | $H_0$: $\mu_{AR,1} \leq 0$ | $H_1$: $\mu_{AR,1} > 0$ |
| 3 | $H_0$: $\mu_{AR,1} = 0$ | $H_1$: $\mu_{AR,1} \neq 0$ |
| 4 & 5 | $H_0$: $\mu_{AR,1} \geq 0$ | $H_1$: $\mu_{AR,1} < 0$ |

To see if the abnormal returns from each portfolio during the financial crisis are in line with our hypotheses we perform the statistical test outlined below in **Table 15**. The average abnormal return is now computed on data from period 2.

**Table 15.** Table 15 illustrates the hypothesis test conducted on the alphas of the portfolios during the financial crisis (period 2).

| Portfolio | $H_0$ | $H_1$ |
|---|---|---|
| 1-5 | $H_0$: $\mu_{AR,2} = 0$ | $H_1$: $\mu_{AR,2} \neq 0$ |

To test whether the abnormal return from each portfolio differs between the two time periods we perform the statistical tests outlined in **Table 16** below.

**Table 16.** Table 16 illustrates the hypotheses tests conducted on the difference in abnormal return between the financial crisis (period 2) and the reference period (period 1) of the portfolios.

| Portfolio | $H_0$ | $H_1$ |
|---|---|---|
| 1 & 2 | $H_0$: $\mu_{AR,2} - \mu_{AR,1} \geq 0$ | $H_1$: $\mu_{AR,2} - \mu_{AR,1} < 0$ |
| 3 | $H_0$: $\mu_{AR,2} = \mu_{AR,1}$ | $H_1$: $\mu_{AR,2} \neq \mu_{AR,1}$ |
| 4 & 5 | $H_0$: $\mu_{AR,2} - \mu_{AR,1} \leq 0$ | $H_0$: $\mu_{AR,2} - \mu_{AR,1} > 0$ |

We then control for different risk factors by using the Fama-French Three Factor Model. We run the following regression for the two time periods:

$$R_{pcw} - R_{fcw} = \alpha_p + \beta_p(R_{bcw} - R_{fcw}) + s_p SMB_{cw} + h_p HML_{cw} + \varepsilon_{pw}$$

where:

$R_{fcw}$= return of the risk-free rate in country *c* during week *w*

$\alpha_p$ = the alpha of portfolio *p*

$\beta_p$ = the benchmark beta of portfolio *p*

$s_p$= the SMB beta of portfolio *p*

$SMB_{cw}$= the SMB factor in country *c* during week *w*

$h_p$= the HML beta of portfolio *p*

$HML_{cw}$= the HML factor in country *c* during week *w*

$\varepsilon_{pw}$= the error term of portfolio *p* during week *w*

To see if the alphas for each portfolio during the reference period are in line with what have been found in previous research we perform the statistical tests outlined below in **Table 17** on the alphas from the reference period.

**Table 17.** Table 17 illustrates the hypotheses tests conducted on the alphas of the portfolios during the reference period (period 1).

| Portfolio | $H_0$ | $H_1$ |
|---|---|---|
| 1 & 2 | $H_0$: $\alpha_1 \leq 0$ | $H_1$: $\alpha_1 > 0$ |
| 3 | $H_0$: $\alpha_1 = 0$ | $H_1$: $\alpha_1 \neq 0$ |
| 4 & 5 | $H_0$: $\alpha_1 \geq 0$ | $H_1$: $\alpha_1 < 0$ |

To see if the alphas for each portfolio during the financial crisis are in line with our hypotheses we perform the statistical test outlined below in **Table 18** on the alphas from time period 2.

**Table 18.** Table 18 illustrates the hypothesis test conducted on the alphas of the portfolios during the financial crisis (period 2).

| Portfolio | $H_0$ | $H_1$ |
|---|---|---|
| 1-5 | $H_0$: $\alpha_2 = 0$ | $H_1$: $\alpha_2 \neq 0$ |

To test whether the alphas for each portfolio differs between the two time periods we perform the statistical tests outlined in **Table 19** below.

**Table 19.** Table 19 illustrates the hypotheses tests conducted on the difference in alphas between the financial crisis (period 2) and the reference period (period 1) of the portfolios.

| Portfolio | $H_0$ | $H_1$ |
|---|---|---|
| 1 & 2 | $H_0$: $\alpha_2 - \alpha_1 \geq 0$ | $H_1$: $\alpha_2 - \alpha_1 < 0$ |
| 3 | $H_0$: $\alpha_2 = \alpha_1$ | $H_1$: $\alpha_2 \neq \alpha_1$ |
| 4 & 5 | $H_0$: $\alpha_2 - \alpha_1 \leq 0$ | $H_0$: $\alpha_2 - \alpha_1 > 0$ |

We also perform hypotheses tests on the difference in weekly average abnormal return and alpha between the portfolios within the same time period. This is to see if there is a statistical significant difference in average abnormal return or alpha between the portfolios during the reference period or the financial crisis. Hence, the null hypothesis is that the returns of the portfolios are equal. These tests are therefore two tail tests and are conducted on the weekly average abnormal return and alphas during both time periods respectively.

# V. Results

**Portfolio Characteristics and Returns**

One of the findings in this thesis is that portfolio 1 has the highest cumulative abnormal return during the full sample period in all countries, as illustrated in **Diagram 1-4.** This result indicates that analysts actually have the ability to predict which stocks will perform the best. In Norway and Denmark, portfolio 5 has the lowest cumulative abnormal returns, which indicate that analysts were good at predicting which stocks that would underperform. An interesting finding is that the Norwegian portfolios perform exactly as the analysts predict, only looking at cumulative abnormal returns. In contrast, portfolio 5 in Sweden and Finland performed third best when looking at the cumulative abnormal returns. This does not indicate that analysts are good at predicting future stock returns. In conclusion, the abnormal returns for the portfolios differ between the countries.

Looking at the cumulative abnormal returns during the financial crisis, illustrated in **Diagram 5-8**, the results are also different for the countries. In Sweden and Denmark, the worst performing portfolio is portfolio 2 and in Finland the corresponding portfolio is portfolio 1. In Denmark and Finland portfolio 5 and 4 performs best respectively. These diagrams therefore suggest that the results have reversed during the financial crisis compared to the reference period.

The cumulative returns for all countries and portfolios can be found in the appendix, **A1**-**A4**, as can the cumulative index returns for all countries, **A5**-**A8**.

The main results of this thesis can be found in **Table 20**. We find that the average abnormal returns are significantly positive at a 1% level for both portfolio 1 and 2 during period 1. In period 2, portfolio 2 has a negative average abnormal return, which is significant at a 5 % level. No other average abnormal return for any portfolio in any time period is significant at a reasonable level. Observing the signs of the average abnormal return, portfolio 1 and 5 have a positive average abnormal return during period 2. Furthermore, portfolio 5 has a negative average abnormal return during period 1. We find that the alphas for portfolio 1 and 2 are positive at a 1% significance level during time period 1. This is consistent with Barber et al. (2001) that also find a positive abnormal return for portfolio 1 controlling for momentum in addition to the Fama-French factors. Few have found a significant positive abnormal return for portfolio 1 and the reason for this could be that the number of firms in the strong buy portfolio often is small, thereby decreasing the power of hypotheses tests on portfolio 1. For instance Wåghäll, Lystedt (2008)) find positive abnormal returns for both portfolio 1 and 2 where only the abnormal return from portfolio 2 is significant. During period 2, we find that portfolio 2 has an insignificant negative alpha. An interesting finding is that portfolio 5 has a positive alpha which is statistically significant at a 5 % level and this alpha is greater than the alpha observed for portfolio 2 during both time period 1 and 2. As can be seen in **Table 20,** the SMB factor is significant for portfolio 1 and 5 during both time periods. This is consistent with Barber et al. (2001) that also find a significant SMB factor for portfolio 1 and 5. A potential explanation for why the SMB factor is significant for these portfolios is that they contain firms with a low average market value and therefore small firms. Furthermore, the HML factor is also statistically significant for portfolio 1 and 5 during both time periods. This is also consistent with Barber et al. (2001) that find a significant HML factor for portfolio 1 and 5. The significance and the impact of the HML factor increases for portfolio 5 during the financial crisis.

The differences in average weekly abnormal return and in alpha between time periods are illustrated in **Table 21.** The difference in mean abnormal return and alpha is negative and significant at a 1% level for portfolio 2. The interpretation of this result is that portfolio 2 performs significantly worse in period 2 compared to period 1. In addition, portfolio 5 has a significantly positive difference in the average abnormal return and in alpha in period 2 compared to period 1. Therefore portfolio 5 performs significantly better in period 2 than in period 1. The difference in alphas and abnormal returns are not significant for any other portfolio but looking at the signs, portfolio 1 has a negative difference in average abnormal return and alpha implying that it performs worse during period 2 than during period 1. The differences in abnormal return and alpha are low and insignificant for both portfolio 3 and 4.

The differences in average abnormal return and alphas between the different portfolios within the *same time period* are illustrated in **Table 22**. Overall, we find that the difference in average abnormal returns and in alphas between the portfolios are statistically significant during the reference period. In addition, most signs of the differences are as we should expect them to be if analyst recommendations are valuable information. During the period of financial crisis, the difference in average abnormal returns between the portfolios have low significance overall. There is a significant difference between portfolio 2 and 5, showing that portfolio 5 has an abnormal return that is 0.387% higher than that of portfolio 2's at a 10 % significance level. Looking at the signs of the differences, there is a tendency toward reversed results in comparison to the reference period. The differences in alphas during the financial crisis show that portfolio 1 generates a significantly higher alpha than portfolio 2 and portfolio 5 generates a significantly higher alpha than portfolio 2, 3 and 4. Overall the differences in alphas have very low significance during the financial crisis, in line with the abnormal returns during the same period.

## Robustness Tests

**Table 23** gives the standard deviations, kurtosis and skewness of the weekly raw returns for each portfolio during the two time periods. We observe that during the reference period, portfolio 1 has a lower kurtosis and is less negatively skewed than practically all other portfolios. During the financial crisis, on the other hand, the kurtosis is approximately at same level across portfolios, whereas portfolio 1 is the most negatively skewed and portfolio 5 the least. Regarding portfolio 5 in particular, the probability of an extremely low return is lower during the period of financial crisis, since the skewness increases and the kurtosis decreases substantially compared to the reference period. Overall, we can thus draw the conclusion that the positive abnormal returns of the portfolio with the most favorable recommendations are not achieved at the expense of a higher tail risk during the reference period. But then again, during the crisis the positive alpha of the highest rated portfolio is to some extent achieved at a higher tail risk, whereas that of the lowest rated portfolio is not.

Observing the standard deviations for the portfolios, we can see that the total standard deviation for all portfolios increases from 2.84% to 5.20% during the financial crisis. This is reasonable since volatility of returns tends to increase during crises. Further, we find that portfolio 1 and 5 have the highest standard deviation during the reference period. All the weekly portfolio returns can be found in appendix, **A9-A13**.

### Potential Biases in Results

Potential biases in our obtained results may come from the fact that we approximate the market portfolio with the indexes that are generated for each country and that are based on the stocks covered in our study. This implies that when approximating the market portfolio in our regression with the Fama-French factors, we have excluded stocks that are not covered by analysts. This could cause a bias since the entire market is not represented and furthermore, the stocks that analysts chose to cover may have special characteristics. That would imply that the indexes are not a perfect approximation of the market portfolio due to certain characteristics that covered stocks may have. On the other hand, looking at **Tables 8-11**, we conclude that the total market value of covered stocks is at least 80% of the total market value of the index. This bias should however not affect our results to any great extent.

Furthermore, we have not excluded outliers from our dataset. This could cause biases in our results since extreme returns that affect the average returns and alphas are not excluded. On the other hand, these more extreme returns could for instance be the results of different events such as company specific news. Therefore we believe that they should be included in our dataset to capture the true returns. The risk of this inclusion is that we may catch effects that are not representative for stock returns over long time periods. Given that we cover such an extensive period of time we do not believe that this is the case.

# VII. Conclusions and Implications

In this thesis we have studied analysts' ability to give profitable stock recommendations during the financial crisis in comparison to a reference period. During the reference period we find that analysts' buy recommendations generate a positive abnormal return and alpha. However they do not possess an equally good ability when it comes to sell recommendations.

During the financial crisis we find other results. If you look at stocks with the strongest buy recommendations, they still perform well, although they generate a slightly lower alpha, which is not as significant as during the reference period. Surprisingly, we find that the lowest rated portfolio generates a significantly positive alpha during the crisis.

Overall, we can conclude that the profitability of following analyst recommendation declined during the financial crisis. This is also evident from the differences in abnormal return and alpha between the two time periods. Portfolio 5 generates a weekly alpha that is 0.23 % higher and statistically significant during the financial crisis. Therefore, we find that the stocks that analysts thought would perform badly, actually performed better than the analysts predicted. We can also conclude that analysts were significantly worse at giving buy recommendations as well during the crisis. We find that the weekly alpha for portfolio 2 is 0.47 % lower during the financial crisis than under the reference period. We also find that the weekly average abnormal return for portfolio 5 (portfolio 2) increases (decreases) significantly with 0.21 % (-0.40 %) during the financial crisis in comparison to the reference period.

If we compare the financial crisis with bear markets and the reference period with bull markets, this is somewhat inconsistent with Gylling et al. (2008). They find that when using value weighted portfolios, portfolio 5 is less likely to beat the benchmark and portfolio 2 is more likely to beat the benchmark if markets are bear. For an equally weighted portfolio, the possibility that portfolio 5 performs better than the benchmark is higher is bear markets, which is more consistent with our findings. What also seems to be consistent with our findings is that when using value weighted portfolios the authors find that portfolio 1 is less likely to beat the benchmark when markets are bear. Thus we can conclude that during the financial crisis the market did not behave exactly like it does during times characterized by bear markets.

What are then the implications of our results for investors? Since we find significant positive alphas for portfolio 1 and 2 during the reference period, one implication could be that we have found a mispricing, which investors could exploit. However, to be able examine if this is possible we need to take transaction costs into account. Since transaction costs differ a lot among different investors, it is difficult to make a relevant calculation of whether or not it is possible to generate any abnormal return by following analyst recommendations after transaction costs. Therefore we leave this to the individual investor, who probably can estimate her transaction costs better than we can. Many other researchers have however tried to evaluate their results also after accounting for transaction costs, for example Barber et al. (2001) and Wåghäll and Lystedt (2008), and the general view is that it is not possible to generate any substantial abnormal returns after transaction costs. We see no reason to believe that this would not hold for our data as well, during the reference period. If you consider the time period during the financial crisis we only find a significantly alpha for portfolio 1 and 5, but the alphas are of approximately the same magnitude as the alphas of portfolio 1 and 2 during the reference period. Hence, given the assumption that the turnover of these portfolios are equal to or greater than that of the reference period, portfolio 1 and 5 can not generate any abnormal return after transaction costs during the crisis. Another implication of our results is that investors should be careful when following analyst recommendations. The quality of the recommendations will be affected by the market conditions to a quite large extent.

Our results seem to suggest that analyst recommendations actually add value during the reference period and to some extent during the financial crisis. However is this really the case? As mentioned earlier, Jegadeesh et al. (2004) propose two different theories to their findings that changes in analyst consensus recommendations indeed can predict future returns. The first is that analysts bring new information to the market by analyzing qualitative aspects of firms and the second is that by the publicity around changes in analyst recommendations, the recommendations generate a price drift themselves. Depending on which explanation you choose to believe in when it comes to if analysts actually add value to investors or not, the interpretation of analysts' declining ability to predict future returns during the financial crisis differs. If you believe that analysts bring new information, then the interpretation could be that during the financial crisis it becomes more difficult to make qualitative evaluations of firms, perhaps caused by the increase in uncertainty, and therefore analysts are not able to make good predictions about future stock returns. If you on the other hand believe that analysts create their own price momentum when changing a recommendation, the interpretation of our results is that during the crisis it becomes more difficult for analysts to do this. During the crisis the investor may be focusing more on other news than analyst recommendations, thereby making it hard for analysts to create this price drift. However, as we find that the portfolio with the lowest rated stocks actually performs relatively well during the crisis, we believe it is reasonable to question analysts' alleged ability to predict future returns. Thus the second explanation, that analyst recommendations create a price drift, seems more plausible than the first.

What could then explain the reversal that we see in our results, where portfolio 5 earns a positive alpha during the financial crisis? If we study **Table 12,** we can see that portfolio 5 has the highest book-to-market ratio of all the portfolios before the crisis and up until 2007. This is consistent with Jegadeesh et al. (2004)), who find that analysts tend to recommend low book-to-market stocks. Since book values are more conservative than market values, because of the conservatism bias in accounting, investors may have considered stocks with higher book-to-market ratios as a *safe haven* during the crisis. A high book-to-market ratio signals that a firm has real assets behind the market value, which could be sold and turned into capital if the firm would go bankrupt and be liquidated. Therefore the investors may view stocks with higher book-to-market ratio as safer. Investor behavior during the financial crisis was characterized by a *flight-to-safety* or *flight-to-quality*, which means that investors sell investments they perceive as high-risk and buy safer investments. This could explain why we see a significant positive alpha and positive difference in alphas between the financial crisis and the reference period for portfolio 5. Since investors sought safety in higher book-to-market ratios, they put an upward price pressure on the value stocks of portfolio 5 and thereby increasing the returns for these stocks. This reasoning is somewhat inconsistent with the view brought forward by Fama and French (1993), where value stocks are associated with the risk factor HML. Nonetheless, the investors did not seem to regard a high book-to-market ratio as a risk factor during the financial crisis if the explanation of flight-to-safety holds.

For further research, we believe it is interesting to investigate the results from a behavioral finance perspective. The flight-to-safety phenomenon in the reasoning above is hard to explain with a rational view. Therefore it is natural to try to explain this phenomenon with another approach. Furthermore, Baker and Wurgler (2006) investigate how investor sentiment affects the cross-section of stock returns and they find that when beginning-of-period proxies for sentiment is low, the subsequent returns are relative high for small stocks, extreme growth stocks, high volatility stocks, etc. It is probable that investor sentiment was low during the financial crisis and that could perhaps explain why portfolio 1 and 5 exhibit positive abnormal returns during that time. Looking at the standard deviation for portfolio 1 and 5 during the reference period, we find that these two portfolios have the highest standard deviation and thus the highest volatility. Furthermore, the firms in portfolio 1 and 5 are relatively small. Therefore, the findings of Baker and Wurgler could potentially explain why these stocks perform well during periods of low investor sentiment and therefore in our case, during the financial crisis. This is an interesting area where further research needs to be conducted in order to investigate the profitability of analyst stock recommendations.

To conclude, we believe that studying analyst recommendations during severe market conditions in other countries are important for creating a deeper understanding of the characteristics of analyst recommendations. Our results suggest that there might be a flight to safety during the financial crisis that generates the relatively high return for portfolio 5. It would therefore be interesting to see whether this finding holds for other periods of crises compared to a reference period. For instance, looking at the dot.com bubble in the late 90's and other exchanges in other parts of the world to create an understanding whether or not the results persist. In conclusion we believe that there is more to learn about analysts' ability to predict future stock returns during severe market conditions.

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# Appendix

**Table 2.** Table 2 illustrates the average, maximal and minimal number of firms in each portfolio during each year from 2003 until 2013 and for the full sample period. The table is based on data from all four countries, Sweden, Denmark, Finland and Norway. The different portfolios are created based on analyst consensus recommendations and they are rebalanced on a weekly basis. Portfolio 1 is the strong buy portfolio and portfolio 5 is the strong sell portfolio. Portfolio 1 contains companies that have consensus recommendations <=1.5, portfolio 2 has companies with consensus recommendations 1.5 - <=2, portfolio 3 has companies with consensus recommendations 2-<=2.5, portfolio 4 has companies with consensus recommendations 2.5 - <=3 and portfolio 5 has companies with consensus recommendations 3- <=5.

| | **Portfolio 1** | | | **Portfolio 2** | | | **Portfolio 3** | | | **Portfolio 4** | | | **Portfolio 5** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Average nr. of firms | Max. | Min. | Average nr. of firms | Max. | Min. | Average nr. of firms | Max. | Min. | Average nr. of firms | Max. | Min. | Average nr. of firms | Max. | Min. |
| 2003 | 8.7 | 11 | 6 | 42.2 | 54 | 29 | 53.7 | 62 | 42 | 88.8 | 104 | 72 | 80.3 | 90 | 69 |
| 2004 | 21.6 | 30 | 8 | 52.9 | 70 | 23 | 56.1 | 67 | 45 | 86.5 | 92 | 80 | 76.6 | 97 | 52 |
| 2005 | 23.0 | 32 | 14 | 65.6 | 87 | 52 | 63.7 | 76 | 49 | 102.3 | 114 | 90 | 75.2 | 82 | 67 |
| 2006 | 37.5 | 46 | 28 | 93.8 | 110 | 75 | 80.1 | 99 | 60 | 105.5 | 122 | 87 | 62.8 | 72 | 48 |
| 2007 | 39.8 | 56 | 31 | 99.0 | 116 | 86 | 101.6 | 114 | 89 | 106.2 | 122 | 90 | 72.8 | 83 | 60 |
| 2008 | 50.5 | 60 | 42 | 100.7 | 124 | 81 | 107.1 | 114 | 97 | 109.8 | 122 | 99 | 76.2 | 110 | 58 |
| 2009 | 33.3 | 43 | 27 | 74.1 | 81 | 67 | 84.9 | 104 | 65 | 127.7 | 136 | 103 | 123.6 | 144 | 96 |
| 2010 | 37.8 | 44 | 33 | 101.7 | 118 | 75 | 108.7 | 124 | 93 | 123.2 | 136 | 113 | 81.5 | 106 | 61 |
| 2011 | 32.4 | 37 | 23 | 119.8 | 139 | 106 | 113.3 | 127 | 100 | 128.3 | 136 | 119 | 73.1 | 82 | 64 |
| 2012 | 22.0 | 28 | 19 | 121.2 | 138 | 109 | 111.0 | 122 | 94 | 117.7 | 129 | 104 | 78.3 | 95 | 65 |
| 2013 | 23.1 | 28 | 19 | 112.8 | 121 | 104 | 82.3 | 94 | 74 | 128.7 | 134 | 120 | 86.5 | 97 | 74 |
| Full period | 34.2 | 60 | 6 | 97.1 | 139 | 23 | 92.9 | 127 | 42 | 113.2 | 136 | 72 | 83.3 | 144 | 48 |

**Table 3**. Table 3 shows descriptive statistics for stocks in the sample that are listed on OMX Stockholm (Sweden). It illustrates the average number of analysts covering each company in all portfolios and for each portfolio separately by year during the full time period. The average market value, in local currency and millions, and book-to-market ratio for the companies in each portfolio separately and all portfolios are also given by year over the entire sample period. The different portfolios are created based on analyst consensus recommendations and they are rebalanced on a weekly basis. Portfolio 1 is the strong buy portfolio and portfolio 5 is the strong sell portfolio. Portfolio 1 contains companies that have consensus recommendations <=1.5, portfolio 2 has companies with consensus recommendations 1.5 - <=2, portfolio 3 has companies with consensus recommendations 2-<=2.5, portfolio 4 has companies with consensus recommendations 2.5 - <=3 and portfolio 5 has companies with consensus recommendations 3- <=5.

| | **All portfolios** | | | **Portfolio 1** | | | **Portfolio 2** | | | **Portfolio 3** | | | **Portfolio 4** | | | **Portfolio 5** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Average nr, of analysts/company | Average market value (SEKm) | Average book-to-market | Average nr, of analysts/company | Average market value (SEKm) | Average book-to-market | Average nr, of analysts/company | Average market value (SEKm) | Average book-to-market | Average nr, of analysts/company | Average market value (SEKm) | Average book-to-market | Average nr, of analysts/company | Average market value (SEKm) | Average book-to-market | Average nr, of analysts/company | Average market value (SEKm) | Average book-to-market |
| 2003 | 7.49 | 12 650 | 0.80 | 2.14 | 1 788 | 0.79 | 2.91 | 2 370 | 0.75 | 12.32 | 25 297 | 0.64 | 8.54 | 13 775 | 0.88 | 6.50 | 10 121 | 0.91 |
| 2004 | 7.13 | 15 622 | 0.67 | 1.67 | 876 | 0.57 | 3.00 | 4 289 | 0.75 | 11.30 | 25 673 | 0.61 | 7.92 | 15 778 | 0.66 | 7.17 | 18 678 | 0.71 |
| 2005 | 6.81 | 17 073 | 0.63 | 1.56 | 1 516 | 0.45 | 3.08 | 4 511 | 0.62 | 9.56 | 35 557 | 0.74 | 10.43 | 25 990 | 0.65 | 5.50 | 10 500 | 0.66 |
| 2006 | 6.51 | 23 957 | 0.52 | 1.38 | 3 550 | 0.50 | 2.89 | 22 019 | 0.49 | 9.21 | 33 103 | 0.53 | 9.67 | 29 061 | 0.51 | 8.25 | 25 085 | 0.63 |
| 2007 | 6.70 | 30 508 | 0.43 | 1.58 | 2 202 | 0.46 | 3.19 | 20 608 | 0.43 | 11.51 | 63 985 | 0.43 | 9.64 | 40 101 | 0.40 | 9.18 | 24 670 | 0.47 |
| 2008 | 7.22 | 28 889 | 1.10 | 1.88 | 1 746 | 0.44 | 5.42 | 22 568 | 2.91 | 9.34 | 33 418 | 0.51 | 11.09 | 52 114 | 0.51 | 7.67 | 29 748 | 0.77 |
| 2009 | 7.50 | 17 630 | 1.81 | 1.72 | 1 145 | 0.93 | 4.50 | 15 485 | 0.98 | 9.00 | 29 303 | 0.90 | 9.64 | 22 560 | 1.44 | 9.89 | 14 799 | 4.24 |
| 2010 | 7.71 | 22 550 | 0.69 | 1.57 | 1 433 | 0.63 | 3.56 | 17 628 | 0.59 | 9.03 | 22 489 | 0.60 | 10.53 | 32 519 | 0.71 | 9.91 | 23 895 | 0.88 |
| 2011 | 7.23 | 24 865 | 0.57 | 1.72 | 1 790 | 0.60 | 3.70 | 11 901 | 0.55 | 9.59 | 23 693 | 0.44 | 9.76 | 44 573 | 0.56 | 9.46 | 21 172 | 0.76 |
| 2012 | 7.68 | 20 634 | 0.80 | 2.00 | 1 706 | 0.99 | 3.73 | 8 796 | 0.77 | 11.61 | 26 102 | 0.68 | 10.63 | 38 778 | 0.72 | 7.33 | 10 841 | 1.24 |
| 2013 | 7.29 | 21 571 | 0.81 | 2.55 | 2 114 | 1.00 | 2.89 | 4 603 | 0.69 | 9.05 | 29 082 | 0.70 | 9.18 | 24 130 | 0.64 | 8.86 | 34 990 | 1.35 |
| **Full period** | 7.23 | 21 992 | 0.81 | 1.73 | 1 850 | 0.61 | 3.60 | 13 039 | 0.88 | 10.07 | 31 859 | 0.61 | 9.79 | 31 419 | 0.70 | 8.31 | 20 425 | 1.32 |

**Table 4.** Table 4 shows descriptive statistics for stocks in the sample that are listed on the OMX Helsinki (Finland). It illustrates the average number of analysts covering each company in all portfolios and for each portfolio separately by year during the full time period. The average market value, in local currency and millions, and book-to-market ratio for the companies in each portfolio separately and all portfolios are also given by year over the entire sample period. The different portfolios are created based on analyst consensus recommendations and they are rebalanced on a weekly basis. Portfolio 1 is the strong buy portfolio and portfolio 5 is the strong sell portfolio. Portfolio 1 contains companies that have consensus recommendations <=1.5, portfolio 2 has companies with consensus recommendations 1.5 - <=2, portfolio 3 has companies with consensus recommendations 2-<=2.5, portfolio 4 has companies with consensus recommendations 2.5 - <=3 and portfolio 5 has companies with consensus recommendations 3- <=5.

| | **All portfolios** | | | **Portfolio 1** | | | **Portfolio 2** | | | **Portfolio 3** | | | **Portfolio 4** | | | **Portfolio 5** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Average nr. of analysts/company | Average market value (EURm) | Average book-to-market | Average nr. of analysts/company | Average market value (EURm) | Average book-to-market | Average nr. of analysts/company | Average market value (EURm) | Average book-to-market | Average nr. of analysts/company | Average market value (EURm) | Average book-to-market | Average nr. of analysts/company | Average market value (EURm) | Average book-to-market | Average nr. of analysts/company | Average market value (EURm) | Average book-to-market |
| 2003 | 7.28 | 1 892 | 0.89 | 2.00 | 95 | 0.52 | 3.67 | 193 | 0.80 | 16.54 | 8 108 | 0.96 | 8.32 | 573 | 0.86 | 4.30 | 783 | 0.97 |
| 2004 | 6.96 | 1 902 | 0.66 | 1.33 | 823 | 0.32 | 1.60 | 105 | 0.69 | 9.33 | 1 783 | 0.50 | 9.65 | 3 553 | 0.67 | 6.12 | 1 077 | 0.71 |
| 2005 | 6.61 | 1 669 | 0.59 | 1.33 | 1 036 | 0.50 | 4.33 | 276 | 0.59 | 10.06 | 1 691 | 0.63 | 7.45 | 3 563 | 0.51 | 5.08 | 315 | 0.67 |
| 2006 | 7.72 | 2 225 | 0.54 | 1.50 | 230 | 0.32 | 4.29 | 1 266 | 0.51 | 11.18 | 2 204 | 0.55 | 10.70 | 4 365 | 0.49 | 5.15 | 440 | 0.70 |
| 2007 | 8.15 | 2 589 | 0.52 | 3.00 | 202 | 0.96 | 6.39 | 2 390 | 0.48 | 10.12 | 2 364 | 0.47 | 10.61 | 5 533 | 0.50 | 5.86 | 484 | 0.54 |
| 2008 | 9.04 | 3 027 | 0.53 | 3.25 | 356 | 0.60 | 6.80 | 625 | 0.58 | 10.91 | 4 151 | 0.52 | 11.15 | 6 024 | 0.48 | 7.52 | 737 | 0.54 |
| 2009 | 8.42 | 1 492 | 1.08 | 1.50 | 486 | 1.20 | 6.29 | 2 401 | 0.79 | 11.00 | 1 904 | 0.90 | 13.55 | 3 323 | 1.15 | 5.10 | 180 | 1.17 |
| 2010 | 8.81 | 1 880 | 0.75 | 1.00 | 23 | 0.75 | 1.86 | 197 | 0.72 | 12.06 | 1 394 | 0.82 | 11.35 | 3 081 | 0.69 | 6.53 | 1 378 | 0.77 |
| 2011 | 8.12 | 2 084 | 0.63 | 1.17 | 23 | 0.96 | 3.00 | 253 | 0.64 | 12.61 | 4 165 | 0.53 | 11.11 | 3 404 | 0.52 | 5.74 | 638 | 0.72 |
| 2012 | 8.83 | 1 507 | 0.80 | 2.33 | 69 | 0.83 | 9.67 | 1 025 | 0.92 | 10.95 | 1 992 | 0.91 | 11.59 | 2 879 | 0.82 | 7.07 | 858 | 0.71 |
| 2013 | 8.96 | 1 864 | 0.82 | 2.25 | 98 | 0.62 | 3.50 | 219 | 1.11 | 11.47 | 3 492 | 0.80 | 10.24 | 2 258 | 0.90 | 8.83 | 1 288 | 0.73 |
| Full period | 8.13 | 2 019 | 0.71 | 1.98 | 266 | 0.71 | 4.85 | 876 | 0.66 | 11.39 | 2 966 | 0.68 | 10.51 | 3 581 | 0.67 | 6.16 | 756 | 0.77 |

**Table 5.** Table 5 shows descriptive statistics for stocks in the sample that are listed on the Oslo Bors (Norway). It illustrates the average number of analysts covering each company in all portfolios and for each portfolio separately by year during the full time period. The average market value, in local currency and millions, and book-to-market ratio for the companies in each portfolio separately and all portfolios are also given by year over the entire sample period. The different portfolios are created based on analyst consensus recommendations and they are rebalanced on a weekly basis. Portfolio 1 is the strong buy portfolio and portfolio 5 is the strong sell portfolio. Portfolio 1 contains companies that have consensus recommendations <=1.5, portfolio 2 has companies with consensus recommendations 1.5 - <=2, portfolio 3 has companies with consensus recommendations 2-<=2.5, portfolio 4 has companies with consensus recommendations 2.5 - <=3 and portfolio 5 has companies with consensus recommendations 3- <=5.

| | **All portfolios** | | | **Portfolio 1** | | | **Portfolio 2** | | | **Portfolio 3** | | | **Portfolio 4** | | | **Portfolio 5** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Average nr, of analysts/company | Average market value (NOKm) | Average book-to-market | Average nr, of analysts/company | Average market value (NOKm) | Average book-to-market | Average nr, of analysts/company | Average market value (NOKm) | Average book-to-market | Average nr, of analysts/company | Average market value (NOKm) | Average book-to-market | Average nr, of analysts/company | Average market value (NOKm) | Average book-to-market | Average nr, of analysts/company | Average market value (NOKm) | Average book-to-market |
| 2003 | 7.75 | 7 690 | 1.06 | 1.67 | 387 | 1.09 | 6.70 | 2 301 | 1.26 | 13.55 | 18 871 | 1.04 | 5.67 | 12 416 | 1.77 | 7.07 | 763 | 0.35 |
| 2004 | 5.89 | 9 345 | 0.72 | 1.90 | 1 734 | 0.50 | 2.88 | 2 420 | 0.87 | 8.60 | 10 981 | 0.62 | 5.65 | 5 671 | 0.93 | 7.86 | 21 446 | 0.62 |
| 2005 | 5.06 | 10 246 | 0.64 | 2.06 | 1 765 | 0.46 | 4.00 | 4 701 | 0.76 | 11.43 | 37 169 | 0.53 | 5.47 | 8 592 | 0.52 | 2.50 | 544 | 1.17 |
| 2006 | 5.00 | 12 652 | 0.60 | 2.05 | 3 376 | 0.47 | 3.51 | 3 541 | 0.72 | 9.63 | 43 898 | 0.56 | 6.00 | 16 908 | 0.38 | 6.75 | 6 154 | 0.64 |
| 2007 | 5.13 | 14 414 | 0.52 | 2.46 | 3 792 | 0.37 | 3.78 | 6 334 | 0.55 | 9.96 | 46 882 | 0.46 | 6.21 | 11 098 | 0.57 | 2.75 | 3 284 | 0.57 |
| 2008 | 6.92 | 16 023 | 0.55 | 3.06 | 1 940 | 0.51 | 5.22 | 8 043 | 0.76 | 10.18 | 23 596 | 0.45 | 7.24 | 31 076 | 0.49 | 5.36 | 4 132 | 0.46 |
| 2009 | 6.58 | 7 401 | 1.74 | 2.22 | 435 | 1.20 | 4.26 | 2 477 | 1.62 | 13.36 | 25 565 | 1.56 | 5.29 | 1 104 | 2.21 | 4.89 | 1 738 | 1.90 |
| 2010 | 7.16 | 11 195 | 1.00 | 2.78 | 4 403 | 0.45 | 4.79 | 8 580 | 1.17 | 11.42 | 24 087 | 0.94 | 7.83 | 4 615 | 0.59 | 5.14 | 1 606 | 1.36 |
| 2011 | 7.90 | 12 357 | 0.85 | 1.63 | 4 627 | 1.08 | 5.46 | 4 109 | 0.83 | 12.47 | 34 035 | 0.80 | 9.89 | 6 899 | 0.77 | 4.15 | 1 354 | 1.13 |
| 2012 | 8.73 | 12 030 | 1.28 | 4.00 | 2 070 | 0.83 | 6.84 | 4 447 | 1.12 | 13.79 | 34 285 | 1.01 | 8.15 | 8 332 | 1.78 | 6.86 | 437 | 1.77 |
| 2013 | 7.73 | 12 127 | 0.99 | 4.00 | 1 691 | 1.02 | 6.10 | 4 319 | 0.78 | 12.00 | 21 233 | 1.28 | 10.00 | 32 656 | 1.44 | 6.88 | 802 | 0.53 |
| Full period | 6.80 | 11 757 | 0.92 | 2.44 | 2 544 | 0.63 | 5.03 | 4 943 | 0.92 | 11.54 | 29 331 | 0.85 | 7.35 | 12 509 | 1.11 | 5.52 | 4 094 | 0.99 |

**Table 6**. Table 6 shows descriptive statistics for stocks in the sample that are listed on the OMX Copenhagen (Denmark). It illustrates the average number of analysts covering each company in all portfolios and for each portfolio separately by year during the full time period. The average market value, in local currency and millions, and book-to-market ratio for the companies in each portfolio separately and all portfolios are also given by year over the entire sample period. The different portfolios are created based on analyst consensus recommendations and they are rebalanced on a weekly basis. Portfolio 1 is the strong buy portfolio and portfolio 5 is the strong sell portfolio. Portfolio 1 contains companies that have consensus recommendations <=1.5, portfolio 2 has companies with consensus recommendations 1.5 - <=2, portfolio 3 has companies with consensus recommendations 2-<=2.5, portfolio 4 has companies with consensus recommendations 2.5 - <=3 and portfolio 5 has companies with consensus recommendations 3- <=5.

| | **All portfolios** | | | **Portfolio 1** | | | **Portfolio 2** | | | **Portfolio 3** | | | **Portfolio 4** | | | **Portfolio 5** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Average nr. of analysts/company | Average market value (DKKm) | Average book-to-market | Average nr. of analysts/company | Average market value (DKKm) | Average book-to-market | Average nr. of analysts/company | Average market value (DKKm) | Average book-to-market | Average nr. of analysts/company | Average market value (DKKm) | Average book-to-market | Average nr. of analysts/company | Average market value (DKKm) | Average book-to-market | Average nr. of analysts/company | Average market value (DKKm) | Average book-to-market |
| 2003 | 6.12 | 6 747 | 1.03 | 7.00 | 3 564 | 0.67 | 4.00 | 3 984 | 0.86 | 9.13 | 18 894 | 0.92 | 6.27 | 6 065 | 0.98 | 6.05 | 4 337 | 1.21 |
| 2004 | 5.77 | 8 629 | 0.78 | 1.20 | 1 645 | 0.67 | 3.86 | 6 465 | 0.80 | 6.83 | 18 361 | 0.68 | 6.75 | 11 819 | 0.63 | 6.31 | 6 347 | 0.91 |
| 2005 | 5.97 | 10 586 | 0.65 | 1.50 | 1 529 | 0.86 | 3.56 | 5 135 | 0.55 | 5.17 | 4 621 | 0.60 | 6.67 | 14 394 | 0.75 | 7.81 | 15 336 | 0.62 |
| 2006 | 6.08 | 13 500 | 0.49 | 2.00 | 13 900 | NA | 3.67 | 2 818 | 0.46 | 6.23 | 8 290 | 0.40 | 8.22 | 30 523 | 0.45 | 5.48 | 7 783 | 0.58 |
| 2007 | 5.34 | 14 385 | 0.41 | 1.43 | 4 698 | 0.39 | 3.36 | 6 212 | 0.31 | 6.56 | 16 257 | 0.36 | 6.08 | 18 824 | 0.47 | 6.82 | 17 326 | 0.42 |
| 2008 | 6.13 | 13 950 | 0.49 | 2.90 | 5 045 | 0.43 | 4.43 | 14 106 | 0.48 | 6.17 | 8 229 | 0.41 | 8.48 | 24 419 | 0.55 | 6.24 | 8 934 | 0.49 |
| 2009 | 6.40 | 7 449 | 1.12 | 2.00 | 560 | 0.93 | 5.62 | 4 917 | 1.14 | 8.05 | 11 959 | 1.09 | 7.00 | 8 894 | 1.42 | 6.71 | 6 018 | 0.96 |
| 2010 | 5.89 | 11 745 | 0.91 | 1.55 | 2 513 | 1.16 | 3.33 | 5 127 | 0.99 | 11.70 | 22 723 | 0.80 | 6.19 | 19 791 | 0.85 | 7.11 | 7 414 | 0.83 |
| 2011 | 6.71 | 15 171 | 0.75 | 1.64 | 3 197 | 0.89 | 4.91 | 9 096 | 0.67 | 9.33 | 22 226 | 0.52 | 10.04 | 26 836 | 0.89 | 5.13 | 4 227 | 0.75 |
| 2012 | 7.70 | 16 517 | 1.05 | 2.00 | 20 870 | 0.89 | 4.18 | 3 876 | 1.28 | 13.50 | 34 566 | 0.81 | 7.55 | 10 344 | 0.92 | 7.73 | 6 495 | 1.56 |
| 2013 | 7.69 | 20 492 | 0.95 | 1.00 | 55 172 | 1.66 | 4.63 | 2 632 | 0.96 | 10.50 | 55 086 | 0.70 | 8.70 | 15 502 | 1.06 | 10.00 | 12 233 | 0.79 |
| Full period | 6.35 | 12 732 | 0.78 | 1.88 | 8 557 | 0.85 | 4.23 | 6 160 | 0.77 | 8.67 | 19 754 | 0.69 | 7.51 | 17 745 | 0.80 | 6.75 | 8 844 | 0.81 |

**Table 7.** Table 7 displays the average and median consensus recommendations of the companies covered, for all countries together and for each country separately. The average and median consensus recommendation is given by year and for the full sample period. The consensus recommendation for each company ranges from 1 to 5, where 1 is a strong buy recommendation and 5 is a strong sell recommendation.

| | **Full sample** | | **Sweden** | | **Finland** | | **Norway** | | **Denmark** | |
|---|---|---|---|---|---|---|---|---|---|---|
| Date | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| 2003 | 2.82 | 2.80 | 2.65 | 2.57 | 2.93 | 2.91 | 2.71 | 2.68 | 2.87 | 3.00 |
| 2004 | 2.68 | 2.67 | 2.77 | 2.67 | 2.90 | 2.93 | 2.57 | 2.50 | 2.88 | 3.00 |
| 2005 | 2.63 | 2.63 | 2.51 | 2.64 | 2.77 | 2.91 | 2.17 | 2.00 | 2.79 | 2.73 |
| 2006 | 2.47 | 2.47 | 2.36 | 2.46 | 2.64 | 2.62 | 2.15 | 2.00 | 2.92 | 2.85 |
| 2007 | 2.47 | 2.42 | 2.26 | 2.19 | 2.65 | 2.50 | 2.30 | 2.00 | 2.64 | 2.75 |
| 2008 | 2.45 | 2.40 | 2.19 | 2.20 | 2.58 | 2.55 | 2.31 | 2.20 | 2.58 | 2.67 |
| 2009 | 2.70 | 2.67 | 2.47 | 2.50 | 3.06 | 2.86 | 2.45 | 2.29 | 2.60 | 2.43 |
| 2010 | 2.52 | 2.47 | 2.51 | 2.53 | 2.97 | 2.91 | 2.46 | 2.32 | 2.58 | 2.60 |
| 2011 | 2.50 | 2.42 | 2.43 | 2.48 | 2.87 | 2.67 | 2.36 | 2.20 | 2.41 | 2.29 |
| 2012 | 2.53 | 2.44 | 2.44 | 2.33 | 2.96 | 2.83 | 2.29 | 2.12 | 2.44 | 2.44 |
| 2013 | 2.58 | 2.50 | 2.61 | 2.53 | 2.84 | 2.84 | 2.24 | 2.00 | 2.57 | 2.54 |
| Full period | 2.56 | 2.50 | 2.46 | 2.50 | 2.83 | 2.75 | 2.34 | 2.19 | 2.65 | 2.67 |

**Table 8.** Table 8 shows descriptive statistics that illustrates how much of the OMX Stockholm (Sweden) that is covered by analysts. It displays the number of listed and covered firms in Sweden by year. It also shows the total market value listed and covered, in local currency and millions, by year. The percentage of the firms and market value covered is given in columns (6) and (7). The average of the market value of all covered firms by year is given in column (8).

| Date | Number of listed firms | Total market value (SEKm) | Number of covered firms | Market value covered firms (SEKm) | % of listed firms | % of market value | Mean market value covered firms (SEKm) |
|---|---|---|---|---|---|---|---|
| 2003 | 200 | 2 100 617 | 113 | 1 429 412 | 56.5% | 68.0% | 12 650 |
| 2004 | 209 | 2 628 036 | 119 | 1 859 025 | 56.9% | 70.7% | 15 622 |
| 2005 | 217 | 2 882 174 | 132 | 2 253 616 | 60.8% | 78.2% | 17 073 |
| 2006 | 233 | 3 919 874 | 150 | 3 593 516 | 64.4% | 91.7% | 23 957 |
| 2007 | 252 | 5 470 471 | 166 | 5 064 376 | 65.9% | 92.6% | 30 508 |
| 2008 | 259 | 5 384 120 | 173 | 4 997 810 | 66.8% | 92.8% | 28 889 |
| 2009 | 259 | 3 214 470 | 171 | 3 014 754 | 66.0% | 93.8% | 17 630 |
| 2010 | 265 | 4 333 352 | 180 | 4 058 984 | 67.9% | 93.7% | 22 550 |
| 2011 | 274 | 5 131 353 | 191 | 4 749 266 | 69.7% | 92.6% | 24 865 |
| 2012 | 275 | 4 223 223 | 191 | 3 941 030 | 69.5% | 93.3% | 20 634 |
| 2013 | 279 | 4 567 765 | 194 | 4 184 719 | 69.5% | 91.6% | 21 571 |

**Table 9.** Table 9 shows descriptive statistics that illustrates how much of the OMX Helsinki (Finland) that is covered by analysts. It displays the number of listed and covered firms in Finland by year. It also shows the total market value listed and covered, in local currency and millions, by year. The percentage of the firms and market value covered is given in columns (6) and (7). The average of the market value of all covered firms by year is given in column (8).

| Date | Number of listed firms | Total market value (EURm) | Number of covered firms | Market value covered firms (EURm) | % of listed firms | % of market value | Mean market value covered firms (EURm) |
|---|---|---|---|---|---|---|---|
| 2003 | 110 | 141 350 | 74 | 140 037 | 67.3% | 99.1% | 1 892 |
| 2004 | 112 | 148 561 | 73 | 138 875 | 65.2% | 93.5% | 1 902 |
| 2005 | 116 | 158 467 | 89 | 148 569 | 76.7% | 93.8% | 1 669 |
| 2006 | 120 | 217 680 | 92 | 204 712 | 76.7% | 94.0% | 2 225 |
| 2007 | 121 | 256 648 | 94 | 243 386 | 77.7% | 94.8% | 2 589 |
| 2008 | 121 | 297 329 | 95 | 287 524 | 78.5% | 96.7% | 3 027 |
| 2009 | 124 | 140 218 | 90 | 134 254 | 72.6% | 95.7% | 1 492 |
| 2010 | 125 | 184 071 | 94 | 176 746 | 75.2% | 96.0% | 1 880 |
| 2011 | 125 | 221 287 | 102 | 212 550 | 81.6% | 96.1% | 2 084 |
| 2012 | 126 | 160 082 | 102 | 153 699 | 81.0% | 96.0% | 1 507 |
| 2013 | 129 | 172 387 | 84 | 156 603 | 65.1% | 90.8% | 1 864 |

**Table 10.** Table 10 shows descriptive statistics that illustrates how much of the Oslo Bors (Norway) that is covered by analysts. It displays the number of listed and covered firms in Finland by year. It also shows the total market value listed and covered, in local currency and millions, by year. The percentage of the firms and market value covered is given in columns (6) and (7). The average of the market value of all covered firms by year is given in column (8).

| Date | Number of listed firms | Total market value (NOKm) | Number of covered firms | Market value covered firms (NOKm) | % of listed firms | % of market value | Mean market value covered firms (NOKm) |
|---|---|---|---|---|---|---|---|
| 2003 | 81 | 425 306 | 51 | 392 184 | 63.0% | 92.2% | 7 690 |
| 2004 | 89 | 665 430 | 64 | 598 060 | 71.9% | 89.9% | 9 345 |
| 2005 | 104 | 896 498 | 79 | 809 437 | 76.0% | 90.3% | 10 246 |
| 2006 | 121 | 1 372 002 | 99 | 1 252 517 | 81.8% | 91.3% | 12 652 |
| 2007 | 132 | 1 798 160 | 118 | 1 700 909 | 89.4% | 94.6% | 14 414 |
| 2008 | 135 | 1 998 200 | 119 | 1 906 719 | 88.1% | 95.4% | 16 023 |
| 2009 | 136 | 917 690 | 118 | 873 370 | 86.8% | 95.2% | 7 401 |
| 2010 | 144 | 1 462 798 | 125 | 1 399 378 | 86.8% | 95.7% | 11 195 |
| 2011 | 148 | 1 694 388 | 129 | 1 593 998 | 87.2% | 94.1% | 12 357 |
| 2012 | 150 | 1 505 375 | 120 | 1 443 544 | 80.0% | 95.9% | 12 030 |
| 2013 | 157 | 1 610 954 | 122 | 1 479 456 | 77.7% | 91.8% | 12 127 |

**Table 11.** Table 11 shows descriptive statistics that illustrates how much of the OMX Copenhagen (Denmark) that is covered by analysts. It displays the number of listed and covered firms in Finland by year. It also shows the total market value listed and covered, in local currency and millions, by year. The percentage of the firms and market value covered is given in columns (6) and (7). The average of the market value of all covered firms by year is given in column (8).

| Date | Number of listed firms | Total market value (DKKm) | Number of covered firms | Market value covered firms (DKKm) | % of listed firms | % of market value | Mean market value covered firms (DKKm) |
|---|---|---|---|---|---|---|---|
| 2003 | 119 | 520 697 | 57 | 384 573 | 47.9% | 73.9% | 6 747 |
| 2004 | 120 | 760 486 | 60 | 517 769 | 50.0% | 68.1% | 8 629 |
| 2005 | 122 | 941 302 | 61 | 645 760 | 50.0% | 68.6% | 10 586 |
| 2006 | 132 | 1 263 239 | 66 | 891 017 | 50.0% | 70.5% | 13 500 |
| 2007 | 140 | 1 459 641 | 73 | 1 050 115 | 52.1% | 71.9% | 14 385 |
| 2008 | 143 | 1 532 743 | 76 | 1 060 187 | 53.1% | 69.2% | 13 950 |
| 2009 | 144 | 802 036 | 77 | 573 600 | 53.5% | 71.5% | 7 449 |
| 2010 | 147 | 1 199 778 | 75 | 880 839 | 51.0% | 73.4% | 11 745 |
| 2011 | 148 | 1 548 370 | 76 | 1 153 029 | 51.4% | 74.5% | 15 171 |
| 2012 | 148 | 1 259 260 | 71 | 1 172 714 | 48.0% | 93.1% | 16 517 |
| 2013 | 150 | 1 517 795 | 62 | 1 270 490 | 41.3% | 83.7% | 20 492 |

**Table 12.** Table 12 illustrates the average book-to-market value for all portfolios and the full sample. The average book-to-market is calculated as the average of all companies book-to-market ratio in the full sample and all portfolios separately during each year and the full sample period. The average book-to-market values are shown by year for the entire sample period. The different portfolios are created based on analyst consensus recommendations and they are rebalanced on a weekly basis. Portfolio 1 is the strong buy portfolio and portfolio 5 is the strong sell portfolio. Portfolio 1 contains companies that have consensus recommendations <=1.5, portfolio 2 has companies with consensus recommendations 1.5 - <=2, portfolio 3 has companies with consensus recommendations 2-<=2.5, portfolio 4 has companies with consensus recommendations 2.5 - <=3 and portfolio 5 has companies with consensus recommendations 3- <=5.

| | **Full sample** | **Portfolio 1** | **Portfolio 2** | **Portfolio 3** | **Portfolio 4** | **Portfolio 5** |
|---|---|---|---|---|---|---|
| Date | Average book-to -market | Average book-to -market | Average book-to -market | Average book-to -market | Average book-to -market | Average book-to -market |
| 2003 | 0.86 | 0.77 | 0.83 | 0.79 | 0.85 | 0.94 |
| 2004 | 0.62 | 0.54 | 0.59 | 0.58 | 0.62 | 0.69 |
| 2005 | 0.55 | 0.45 | 0.51 | 0.53 | 0.55 | 0.61 |
| 2006 | 0.48 | 0.43 | 0.48 | 0.47 | 0.47 | 0.53 |
| 2007 | 0.44 | 0.46 | 0.43 | 0.41 | 0.45 | 0.49 |
| 2008 | 0.89 | 0.58 | 0.81 | 0.66 | 1.24 | 1.01 |
| 2009 | 1.15 | 0.77 | 1.01 | 0.97 | 0.99 | 1.60 |
| 2010 | 0.79 | 0.79 | 0.81 | 0.69 | 0.75 | 0.95 |
| 2011 | 0.84 | 0.86 | 0.87 | 0.73 | 0.83 | 0.96 |
| 2012 | 0.88 | 0.95 | 0.88 | 0.78 | 0.89 | 1.00 |
| 2013 | 0.79 | 0.81 | 0.77 | 0.71 | 0.83 | 0.83 |
| Full period | 0.77 | 0.65 | 0.74 | 0.67 | 0.78 | 0.92 |

**Diagram 1.** Diagram 1 illustrates the weekly value weighted cumulative abnormal logarithmic returns in ***Sweden*** for the five portfolios from 1st of January 2003 to 31st of December 2013.

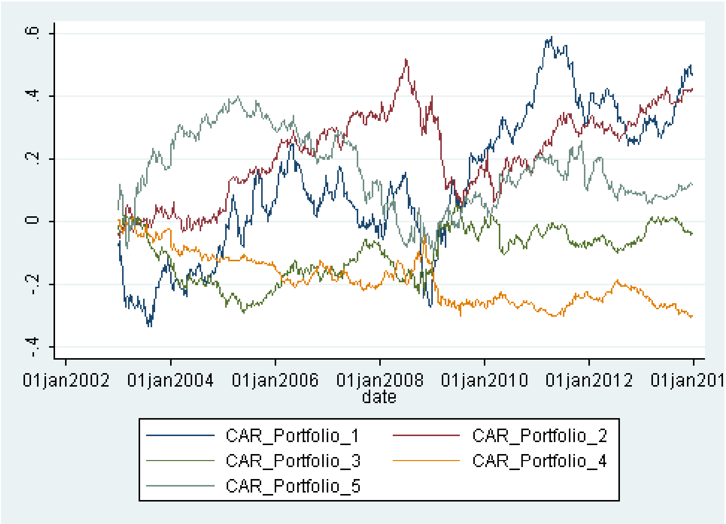



**Diagram 2.** Diagram 2 illustrates the weekly value weighted cumulative abnormal logarithmic returns for the five portfolios in ***Denmark*** from 1st of January 2003 to 31st of December 2013.

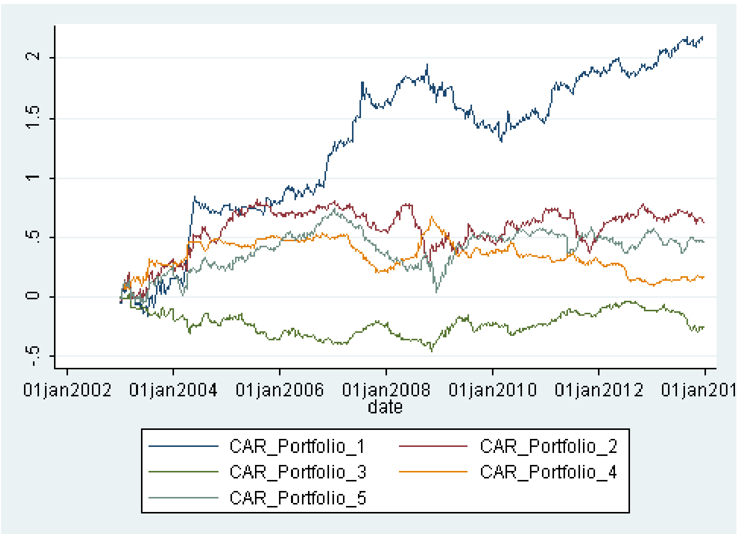


**Diagram 3.** Diagram 3 illustrates the weekly value weighted cumulative abnormal logarithmic returns for the five portfolios in ***Finland*** from 1st of January 2003 to 31st of December 2013.

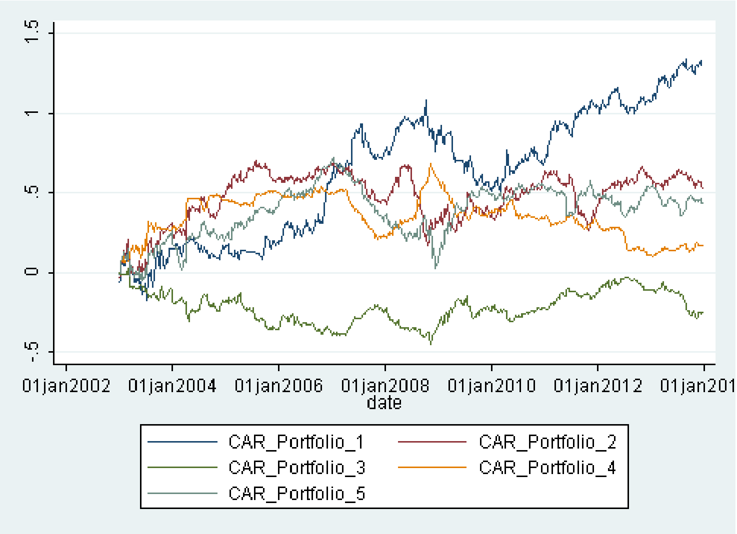



**Diagram 4.** Diagram 4 illustrates the weekly value weighted cumulative abnormal logarithmic returns for the five portfolios in ***Norway*** from 1st of January 2003 to 31st of December 2013.

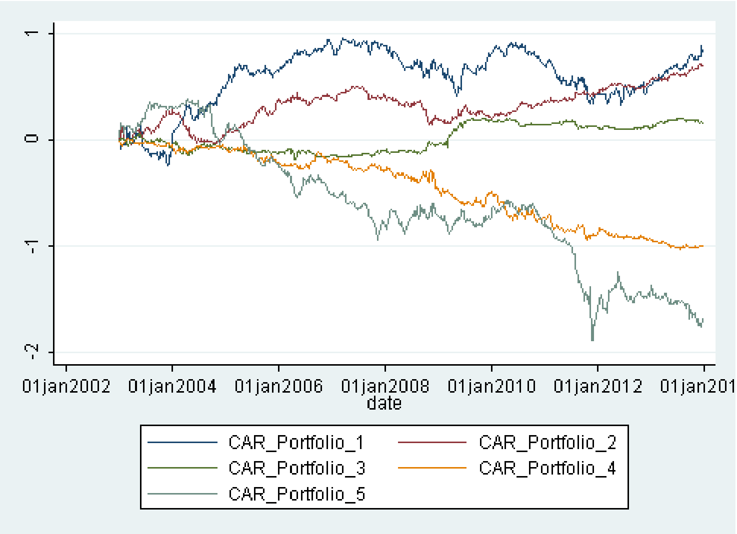


**Diagram 5.** Diagram 5 illustrates the weekly value weighted cumulative abnormal logarithmic returns for the five portfolios in ***Sweden*** from 1st of January 2008 to 31st of December 2009 (time period 2).

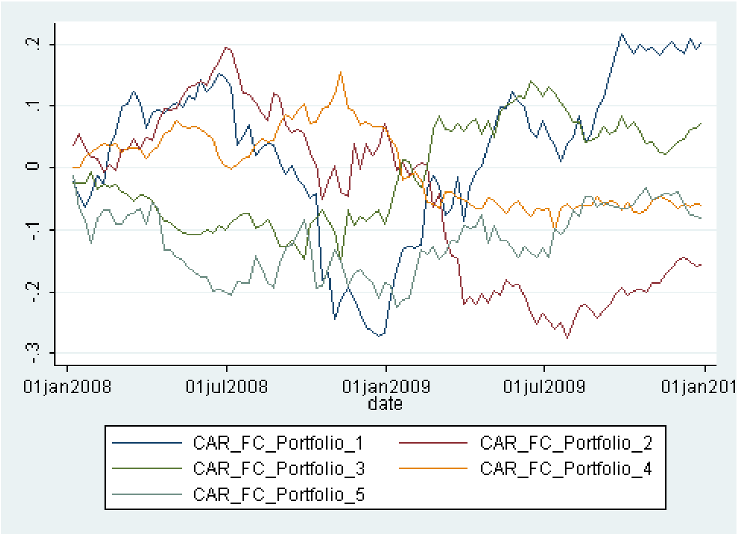



**Diagram 6.** Diagram 6 illustrates the weekly value weighted cumulative abnormal logarithmic returns for the five portfolios in ***Denmark*** from 1st of January 2008 to 31st of December 2009 (time period 2).

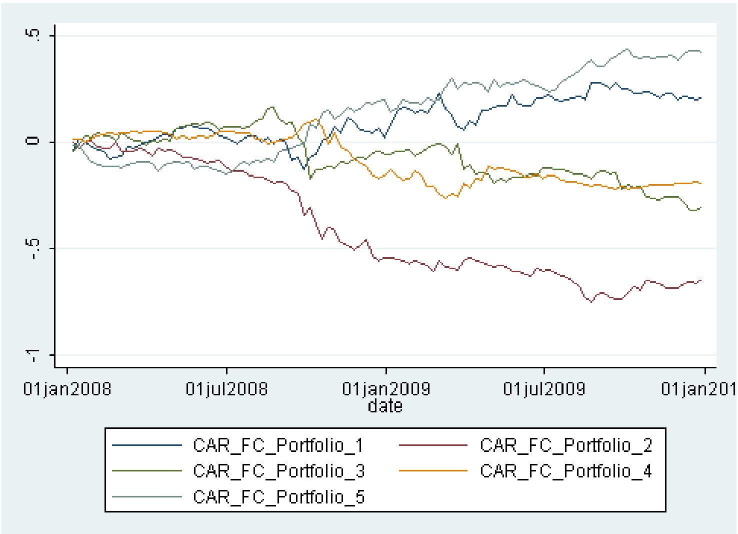


**Diagram 7.** Diagram 7 illustrates the weekly value weighted cumulative abnormal logarithmic returns for the five portfolios in ***Finland*** from 1st of January 2008 to 31st of December 2009 (time period 2).

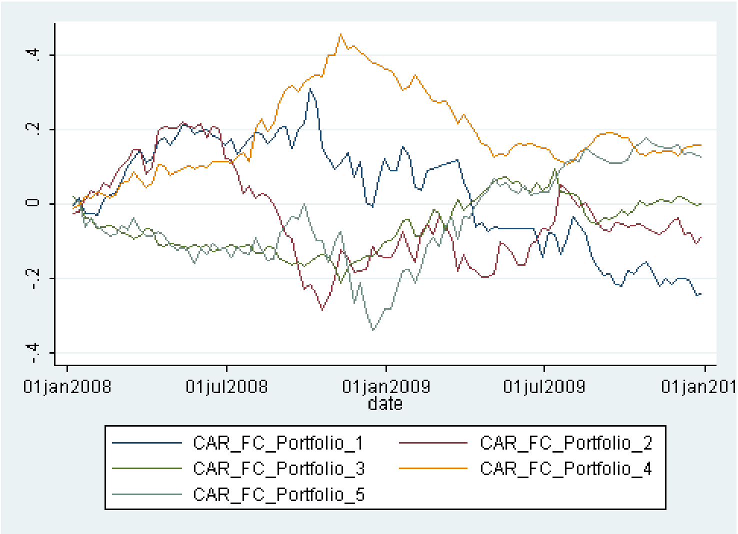



**Diagram 8.** Diagram 8 illustrates the weekly value weighted cumulative abnormal logarithmic returns for the five portfolios in ***Norway*** from 1st of January 2008 to 31st of December 2009 (time period 2).

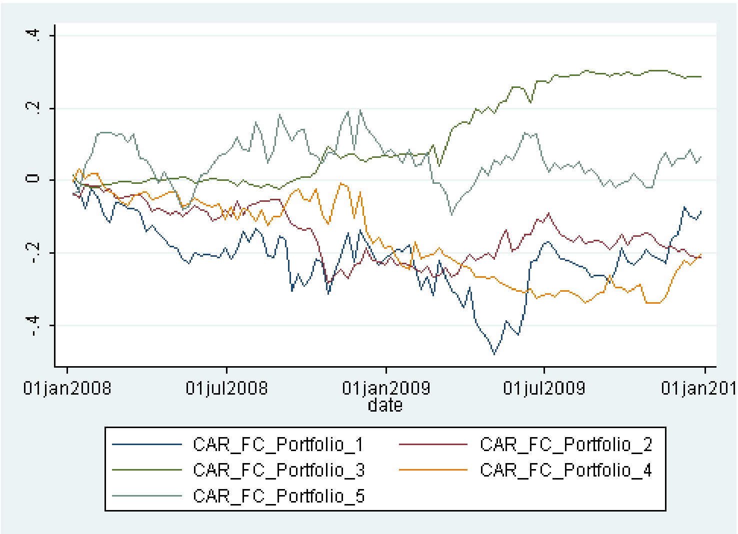


**Table 20.** Table 20 illustrates the weekly returns earned by the portfolios formed according to analyst consensus recommendation. The raw returns are the average weekly value weighted raw returns earned by each portfolio during the two time periods. The abnormal returns are the average weekly value weighted abnormal return, which is calculated by taking the average of the difference between the raw return and the benchmark return ($R_{pcw} - R_{bcw}$) for each portfolio and time period. The Fama-French factors coefficients and the alphas intercept are the estimates from regression $R_{pcw} - R_{fcw} = \alpha_p + \beta_p(R_{bcw} - R_{fcw}) + s_pSMB_{cw} + h_pHML_{cw} + \varepsilon_{pw}$. The t-values are given under the average abnormal returns and alphas respectively. The hypotheses tested in this table are shown in table 14-15 and 17-18.
(*10% sig. lev.)
(**5% sig. lev)
(***1% sig. lev)

| | | | Fama-French Factors | | | | |
|---|---|---|---|---|---|---|---|
| | Average raw return | Average abnormal return | Rm- Rf | SMB | HML | Alpha intercept | $R^2$ |
| Portfolio 1 | | | | | | | |
| 1 | 0.591% | 0.249%*** | 0.707*** | 0.185*** | 0.097* | 0.423%*** | 0.242 |
| | | 2.98 | 14.55 | 2.60 | 1.77 | 4.83 | |
| 2 | -0.080% | 0.017% | 0.798*** | 0.481*** | 0.152* | 0.304%* | 0.545 |
| | | 0.10 | 14.32 | 4.55 | 1.76 | 1.92 | |
| Portfolio 2 | | | | | | | |
| 1 | 0.529% | 0.168%*** | 0.776*** | -0.033 | 0.040 | 0.255%*** | 0.474 |
| | | 3.04 | 16.83 | -0.78 | 1.16 | 4.29 | |
| 2 | -0.304% | -0.232%** | 0.970*** | 0.006 | 0.019 | -0.219% | 0.736 |
| | | -1.73 | 22.03 | 0.06 | 0.32 | -1.58 | |
| Portfolio 3 | | | | | | | |
| 1 | 0.352% | -0.011% | 0.993*** | -0.015 | 0.023 | -0.000% | 0.761 |
| | | -0.31 | 41.16 | -0.54 | 1.14 | -0.00 | |
| 2 | -0.034% | 0.038% | 1.030*** | 0.036 | -0.083* | -0.006% | 0.828 |
| | | 0.36 | 20.53 | 0.52 | -1.65 | -0.06 | |
| Portfolio 4 | | | | | | | |
| 1 | 0.341% | -0.023% | 0.913*** | -0.009 | 0.001 | 0.004% | 0.751 |
| | | -0.67 | 34.03 | -0.35 | 0.03 | 0.10 | |
| 2 | -0.125% | -0.053% | 0.918*** | -0.047 | 0.119* | 0.006% | 0.811 |
| | | -0.49 | 19.05 | -0.68 | 1.73 | 0.06 | |
| Portfolio 5 | | | | | | | |
| 1 | 0.304% | -0.060% | 0.901*** | 0.123** | 0.140** | 0.067% | 0.376 |
| | | -0.81 | 17.39 | 2.08 | 2.44 | 0.90 | |
| 2 | 0.083% | 0.154% | 0.781*** | -0.162* | 0.319*** | 0.298%** | 0.706 |
| | | 1.06 | 12.55 | -1.70 | 4.14 | 2.08 | |

**Table 21.** Table 21 illustrates the results from taking the difference in average weekly value weighted abnormal return ($\mu_2 - \mu_1$) and weekly alpha ($\alpha_2 - \alpha_1$) for each portfolio between the two time periods. The t-values are given under the average abnormal returns and alphas respectively. The hypotheses tested in this table are shown in table 16 and 19.
(*10% sig. lev.)
(**5% sig. lev)
(***1% sig. lev)

| | **Difference in Average Abnormal Return** ($\mu_{AR,2} - \mu_{AR,1}$) | **Difference in Alpha** ($\alpha_2 - \alpha_1$) |
|---|---|---|
| Portfolio 1 | -0.232% | -0.119% |
| | -1.19 | -0.65 |
| Portfolio 2 | -0.400%*** | -0.474%*** |
| | -2.11 | -3.14 |
| Portfolio 3 | 0.049% | -0.006% |
| | 0.44 | -0.06 |
| Portfolio 4 | -0.030% | 0.002% |
| | -0.27 | 0.02 |
| Portfolio 5 | 0.214%* | 0.231%* |
| | 1.32 | 1.44 |

**Table 22.** Table 22 illustrates the difference in weekly alphas and average weekly abnormal returns (AR) between two portfolios (row minus column) during both time period 1 and time period 2. The t-values are given under the average abnormal returns and alphas respectively. Significant levels are shown for the hypothesis test where the null hypothesis is that the alphas (AR) are equal for the portfolios.
(*10% sig. lev.)
(**5% sig. lev)
(***1% sig. lev)

Difference in AR during period 1

| Portfolio | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | 0.082% | 0.260%*** | 0.272%*** | 0.309%*** |
| | | 0.81 | 2.86 | 3.01 | 2.77 |
| 2 | -0.082% | | 0.179%*** | 0.191%*** | 0.228%** |
| | -0.81 | | 2.71 | 2.93 | 2.47 |
| 3 | -0.260%*** | -0.179%*** | | 0.012% | 0.049% |
| | -2.86 | -2.71 | | 0.24 | 0.59 |
| 4 | -0.272%*** | -0.191%*** | -0.012% | | 0.037% |
| | -3.01 | -2.93 | -0.24 | | 0.45 |
| 5 | -0.309%*** | -0.228%** | -0.049% | -0.037% | |
| | -2.77 | -2.47 | -0.59 | -0.45 | |

Difference in AR during period 2

| Portfolio | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | 0.249% | -0.021% | 0.070% | -0.137% |
| | | 1.13 | -0.10 | 0.34 | -0.60 |
| 2 | -0.249% | | -0.270% | -0.179% | -0.387%* |
| | -1.13 | | -1.58 | -1.04 | -1.96 |
| 3 | 0.021% | 0.270% | | 0.091% | -0.117% |
| | 0.10 | 1.58 | | 0.60 | -0.65 |
| 4 | -0.070% | 0.179% | -0.091% | | -0.208% |
| | -0.34 | 1.04 | -0.60 | | -1.15 |
| 5 | 0.137% | 0.387%* | 0.117% | 0.208% | |
| | 0.60 | 1.96 | 0.65 | 1.15 | |

Difference in alpha during period 1

| Portfolio | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | 0.168% | 0.423%*** | 0.419%*** | 0.356%*** |
| | | 1.59 | 4.14 | 4.37 | 3.11 |
| 2 | -0.168% | | 0.255%*** | 0.251%*** | 0.188%** |
| | -1.59 | | 3.60 | 3.53 | 1.98 |
| 3 | -0.423%*** | -0.255%*** | | -0.004% | -0.067% |
| | -4.14 | -3.60 | | -0.07 | -0.80 |
| 4 | -0.419%*** | -0.251%*** | 0.004% | | -0.063% |
| | -4.37 | -3.53 | 0.07 | | -0.75 |
| 5 | -0.356%*** | -0.188%** | 0.067% | 0.063% | |
| | -3.11 | -1.98 | 0.80 | 0.75 | |

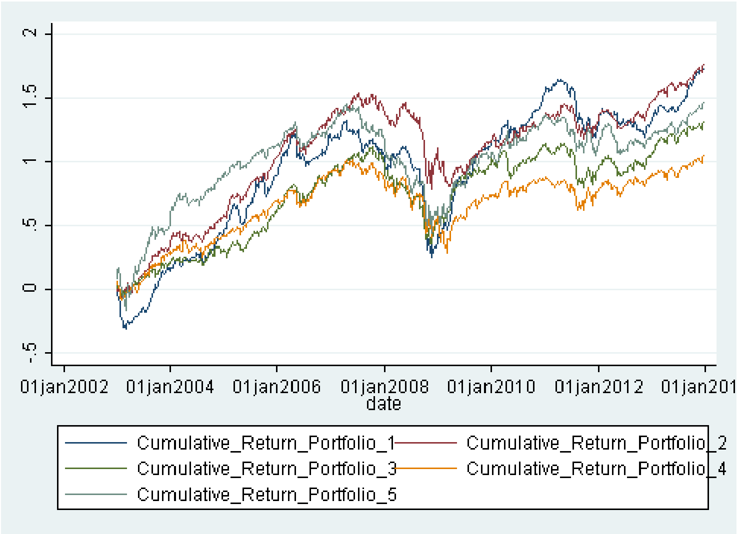
Difference in alpha during period 2

| Portfolio | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | | 0.523%** | 0.311% | 0.298% | 0.007% |
| | | 2.48 | 1.62 | 1.55 | 0.03 |
| 2 | -0.523%** | | -0.213% | -0.225% | -0.517%*** |
| | -2.48 | | -1.21 | -1.28 | -2.59 |
| 3 | -0.311% | 0.213% | | -0.013% | -0.304%* |
| | -1.62 | 1.21 | | -0.08 | -1.70 |
| 4 | -0.298% | 0.225% | 0.013% | | -0.292%* |
| | -1.55 | 1.28 | 0.08 | | -1.63 |
| 5 | -0.007% | 0.517%*** | 0.304%* | 0.292%* | |
| | -0.03 | 2.59 | 1.70 | 1.63 | |

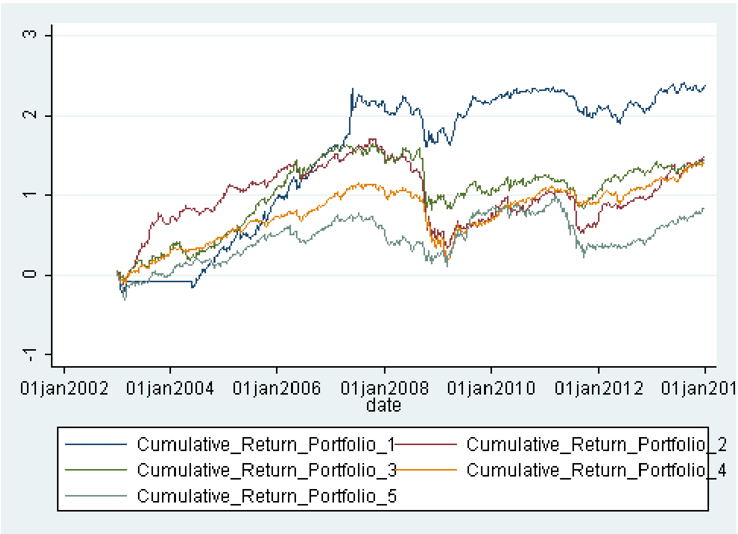
**Table 23.** Table 23 illustrates the kurtosis, skewness and standard deviation for the value weighted raw log returns of each portfolio and all countries during the full sample period, the period of financial crisis, time period 2, and the reference period, time period 1.

| **Full period** | | | | **Time period 1** | | | | **Time period 2** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Portfolio** | **Kurtosis** | **Skewness** | **SD** | **Portfolio** | **Kurtosis** | **Skewness** | **SD** | **Portfolio** | **Kurtosis** | **Skewness** | **SD** |
| 1 | 10.50 | -1.23 | 3.76% | 1 | 6.21 | -0.70 | 3.21% | 1 | 7.75 | -1.31 | 5.05% |
| 2 | 11.13 | -1.18 | 3.42% | 2 | 10.69 | -1.24 | 2.69% | 2 | 6.46 | -0.67 | 5.46% |
| 3 | 12.83 | -1.33 | 3.45% | 3 | 6.73 | -0.89 | 2.83% | 3 | 9.66 | -1.21 | 5.22% |
| 4 | 9.71 | -1.00 | 3.21% | 4 | 6.28 | -0.51 | 2.61% | 4 | 6.91 | -0.98 | 4.89% |
| 5 | 12.67 | -0.83 | 3.78% | 5 | 19.76 | -1.21 | 3.18% | 5 | 6.79 | -0.48 | 5.35% |
| **Total** | **11.74** | **-1.09** | **3.47%** | **Total** | **11.64** | **-0.95** | **2.84%** | **Total** | **7.50** | **-0.86** | **5.20%** |

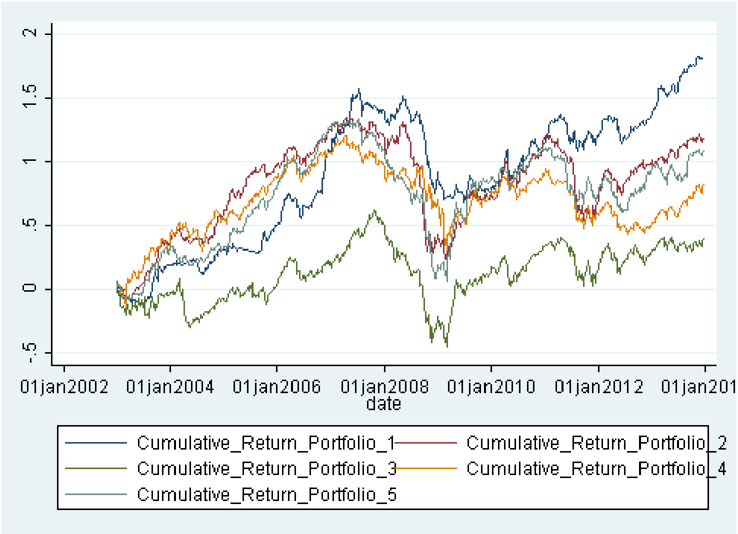
**A1.** The diagram illustrates the cumulative weekly value weighted logarithmic returns for all five portfolios, where the portfolios only comprise Swedish stocks, from January 1st 2003 to December 31st 2013.



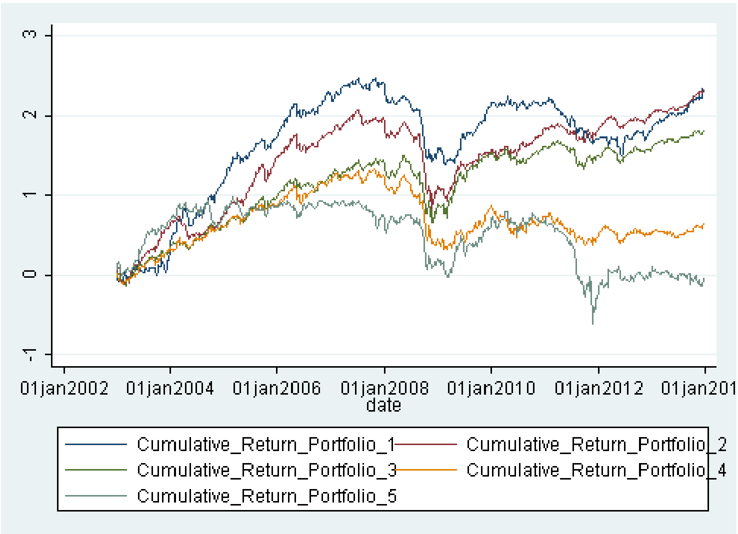

**A2.** The diagram illustrates the cumulative weekly value weighted logarithmic returns for all five portfolios, where the portfolios only comprise Danish stocks, from January 1st 2003 to December 31st 2013.



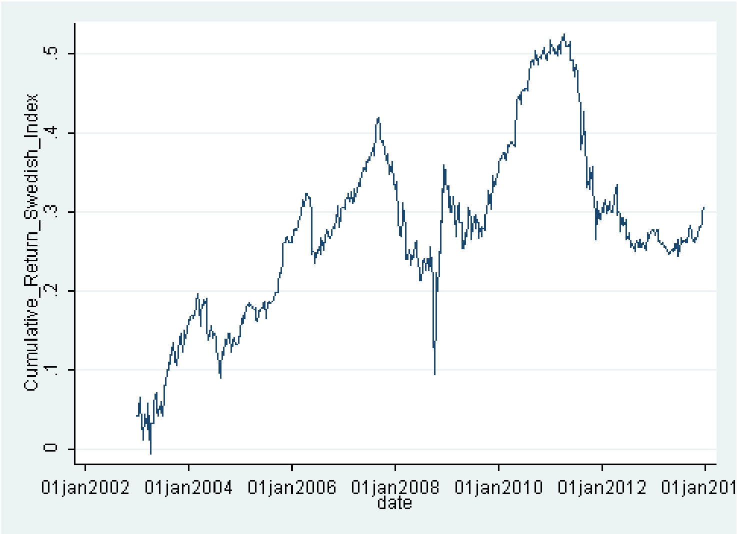
**A3.** The diagram illustrates the cumulative weekly value weighted logarithmic returns for all five portfolios, where the portfolios only comprise Finnish stocks, from January 1st 2003 to December 31st 2013.



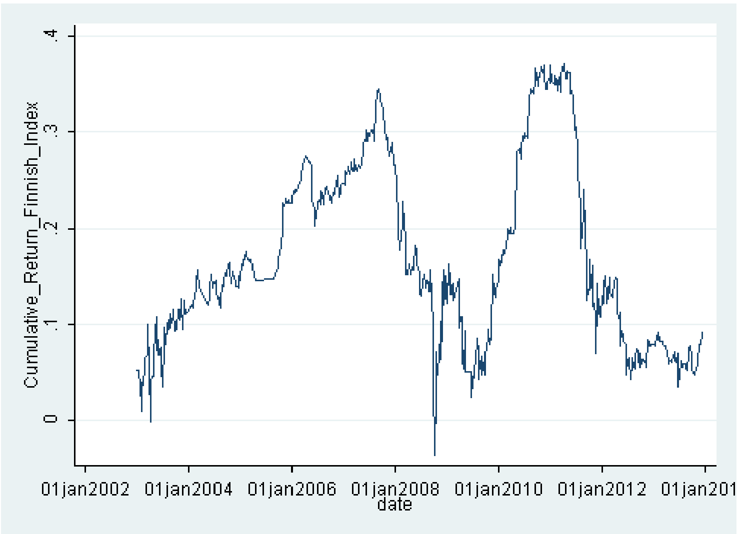

**A4.** The diagram illustrates the cumulative weekly value weighted logarithmic returns for all five portfolios, where the portfolios only comprise Norwegian stocks, from January 1st 2003 to December 31st 2013.



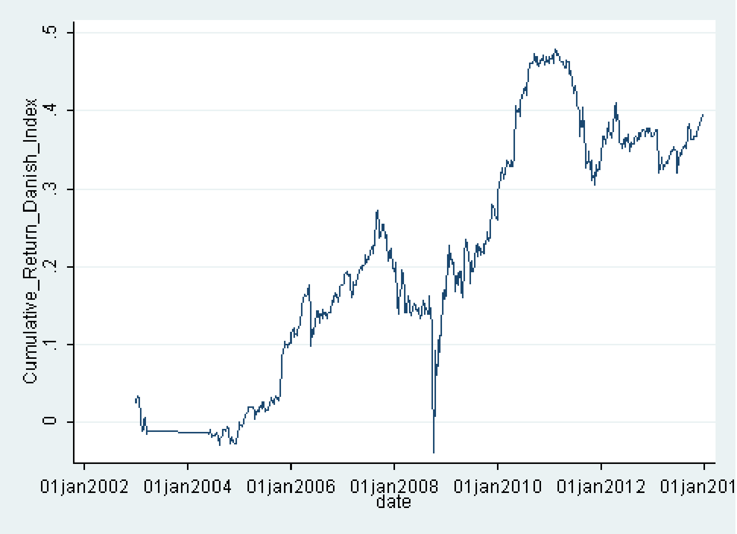
**A5.** The diagram illustrates the cumulative logarithmic return of the value weighted index constructed of all Swedish stocks covered, between 2003 and 2013.



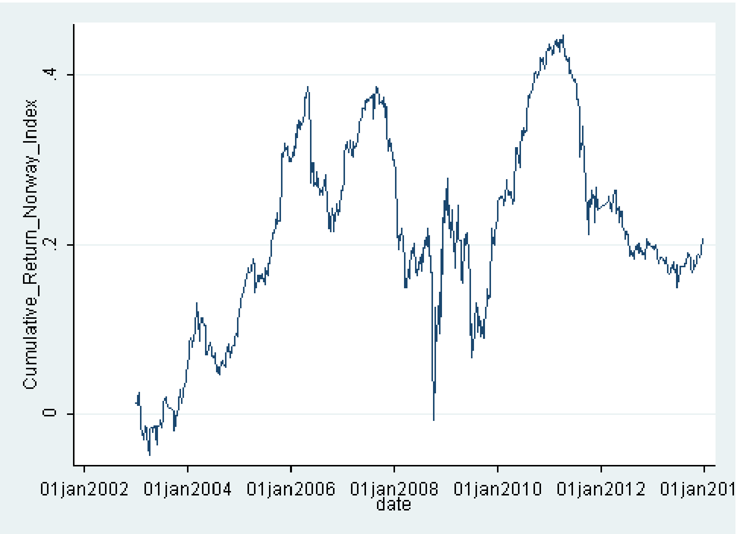

**A6.** The diagram illustrates the cumulative logarithmic return of the value weighted index constructed of all Finnish stocks covered, between 2003 and 2013.



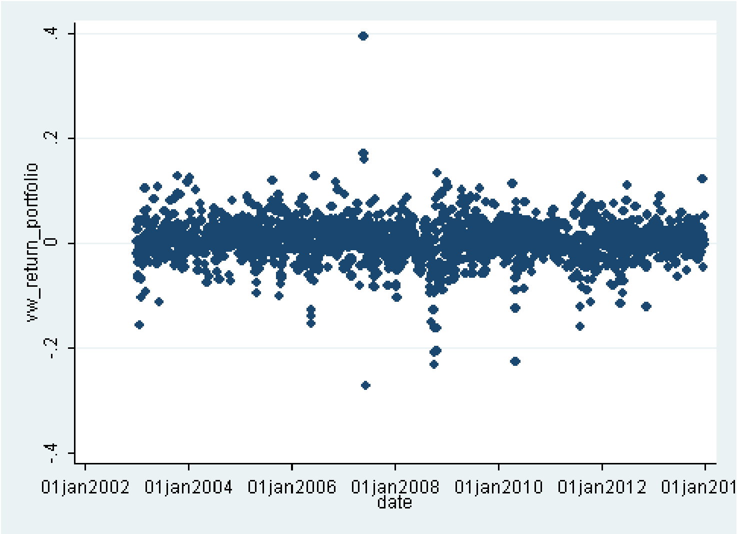
**A7.** The diagram illustrates the cumulative logarithmic return of the value weighted index constructed of all Danish stocks covered, between 2003 and 2013.



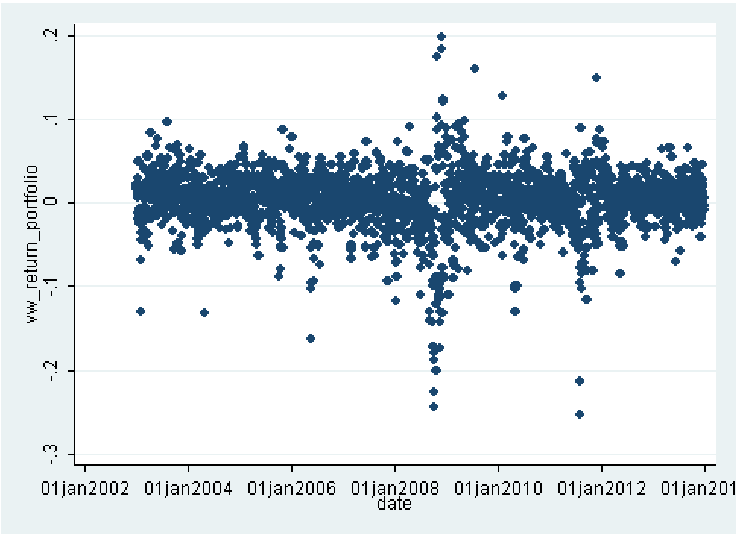

**A8.** The diagram illustrates the cumulative logarithmic return of the value weighted index constructed of all Norwegian stocks covered, between 2003 and 2013.



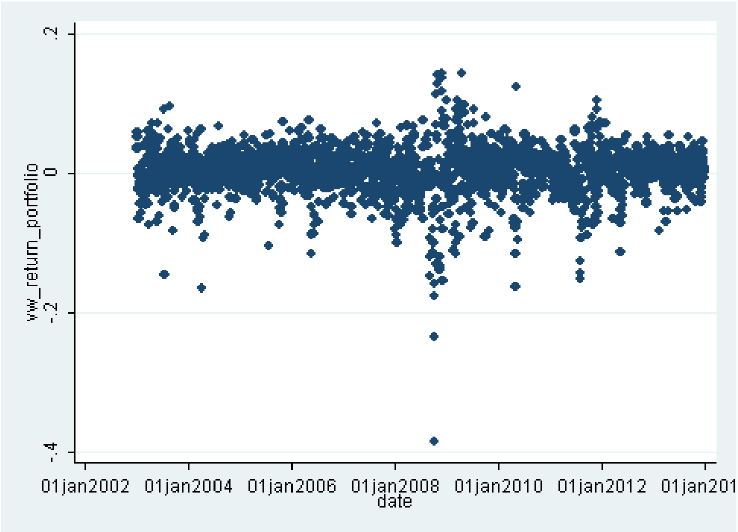
**A9.** The scatterplot illustrates the weekly value weighted logarithmic returns of portfolio 1, comprising all countries, during the time period from 2003 to 2013.



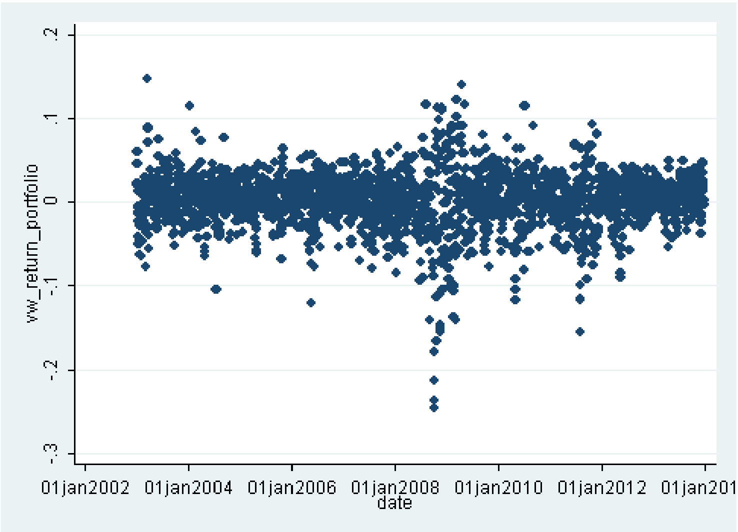

**A10.** The scatterplot illustrates the weekly value weighted logarithmic returns of portfolio 2, comprising all countries, during the time period from 2003 to 2013.



**A11.** The scatterplot illustrates the weekly value weighted logarithmic returns of portfolio 3, comprising all countries, during the time period from 2003 to 2013.




**A12.** The scatterplot illustrates the weekly value weighted logarithmic returns of portfolio 4, comprising all countries, during the time period from 2003 to 2013.



**A13.** The scatterplot illustrates the weekly value weighted logarithmic returns of portfolio 5, comprising all countries, during the time period from 2003 to 2013.