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Analyst Recommendations and Stock Returns

Evaluating the performance of Nordic markets based on analyst consensus recommendations, and the impact of MiFID II

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Abstract

This study evaluates the performance of equity analysts who cover publicly traded stocks in the Nordic markets. To assess their performance, we employ a method that involves creating daily rebalanced portfolios based on the consensus recommendation for each covered company over four years. The returns achieved by these portfolios are then compared to benchmarks using both value and equal weighting. Additionally, to make it as realistic as possible, we account for transaction costs. We find that stocks with favorable consensus recommendations consistently outperform their respective benchmarks, whereas stocks with unfavorable recommendations tend to underperform. Our findings indicate that investing in the most favored equally weighted portfolio yields significant positive abnormal annual net returns, indicating that stock recommendations issued on companies traded in Nordic markets have investment value. We also investigate the impact of MiFID II to determine if it has a positive effect on performance. However, our analysis does not reveal a clear pattern, and we cannot conclude that the regulations have had a positive effect.

Keywords: Stock recommendations, analyst performance, portfolio construction, rebalancing, regulation MiFID II, trading strategies

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1. Introduction

1.1 Background

Processing information is costly, as brokerage houses spend billions of dollars annually on the research departments, presumably aimed at providing valuable trading information and generating superior returns for their clients (Zacks Investment Research 2016). Based on analysts' intensive analytic research process, they provide buy, hold, or sell recommendations to clients, potential investors, or their own management departments. Their activities are expected to generate positive abnormal returns by trading according to analysts' recommendations revisions. Grossman and Stiglitz (1980) observe that market price cannot fully reflect all available information, or else analysts' would receive no compensation for their costly activities. Consequently, investors should only be willing to pay for investment advice if the expected benefits outweigh the cost. These benefits from an investor's perspective, would be positive abnormal returns by trading based on analysts' recommendations.

Their activities leave space for whether analysts are able to provide investment value, which this study focuses on. Specifically, the objective is to evaluate the performance of consensus recommendations and whether MiFID II has had an impact on their performance. We also examine how consensus recommendation performs when compared to benchmarks using constructed value- and equally weighted portfolios, and how the portfolios perform against their benchmark in both bull- and bear markets. Finally, the empirical findings from the returns generated by the stock recommendations will be used to analyze potential trading strategies.

The value of stock recommendations issued by equity analysts is of great importance, as it provides guidance and a direct course of action, which is a valuable tool for investors (Elton et al. 1986). Additionally, these recommendations have the potential to influence investors in financial decision-making, allowing them to supplement their research by gauging market expectations. While forecast revisions function as a valuable trajectory for investors, there is a tendency for an analyst to adjust their previous forecast to align more with the consensus, which may have potential implications on the usefulness for investors.

In 2018, the Markets in Financial Instruments Directive (MiFID II) was implemented as a legislative framework aimed at regulating financial markets and enhancing investor protection (CFA Institute 2017). Before the framework, there was a concern that brokerage houses were bundling research expenses with trading costs. Investors could not scrutinize the discretionary component of expenses associated with research. One extensive change among others, is the requirement of unbundling the cost of equity research from trading costs. Hence, as a result, equity analysts are now obligated to justify the value of recommendations and how external research contributes to better investment outcomes for their clients.

Financial analysts and their work have attracted the interest of numerous researchers. Both academics and practitioners have evaluated the investment value of recommendations. Barber et al. (2001), examine the profitability of portfolios based on consensus recommendations and find statistically abnormal returns both for buy and sell recommended stocks. Several other studies, including Groth et al. (1979), Elton et al. (1986), and Womack (1996) find similar results. However, some studies contradict these findings. Diefenbach (1972), Bidwell (1977), and Desai and Jain (1995) find that recommendations perform worse than the average market, suggesting that analyst recommendations do not provide investment value. While investors may be able to generate returns by following stock recommendations, they may not generate excess returns significantly different from zero net fees (Dimson and Marsh 1984). Barber et al. (2001) find that strategies involving frequent trading often result in significant transaction costs. As a consequence, the net returns of these strategies, while abnormal, may not exceed zero. Furthermore, a more recent study by Fang et al. (2020), concludes that stock recommendations are more profitable after the implementation of MiFID II. Other studies, such as Lang et al. (2019), and Guo and Mota (2021) find that MiFID II has affected analysts' issuance of more price-informative, optimistic, and achievable forecasts.

So far, several studies have examined the financial landscape, focusing on event studies related to the issuance of stock consensus recommendations. In contrast to many of these studies that primarily use US data, which either focus on average price to recommendations (e.g., Womack 1996 and Stickel 1995), earnings forecast accuracy (Loh and Mian 2006), or earnings-per-share forecast accuracy (Clement And Tse 2005), the Nordic markets have been relatively untouched.

The above provide compelling motivation for our analysis, which aims to assess the investment value following analysts' consensus recommendations. To answer the main objective, we formulate three hypotheses, presented below:

Hypothesis 1: Stocks with the most favorable consensus recommendations consistently outperform their benchmark, whereas stocks with the least favorable consensus recommendations consistently underperform their benchmark.

Hypothesis 2: A portfolio based on the most favorable consensus recommendations for Nordic stock market companies, yields positive annual abnormal gross returns, but negative abnormal returns net of transaction costs.[1]

Hypothesis 3: The abnormal returns of our portfolios will increase post-MiFID II.

To evaluate the investment value, we employ the trading approach presented by Barber et al. (2001), which involves creating calendar-time portfolios based on consensus recommendations. To ensure a comprehensive approach, we employ a thorough method entailing frequent rebalancing for each covered company. We examine the consequences of the regulatory framework by analyzing the incremental effect on investment value, looking at consensus recommendations before and after MiFID II. Additionally, to analyze the consensus performance under various market conditions, additional analyses are conducted to assess the performance compared to benchmark using value- and equally weighted portfolios, and performance against benchmarks during bull- and bear markets. We also implement a spread strategy that entails taking a long position in the buy portfolio and a short position in the sell portfolio to assess whether an investor can generate positive abnormal returns from the portfolios. We apply the approach of gathering recommendation data from the Institutional Brokers' Estimate System (I/B/E/S) recorded in Refintiv Eikon over the period January 2016 - December 2019. Our analysis focuses on the Nordic Markets, covering companies listed on the Nasdaq Nordic Main Market (XSTO, XCSE, XHEL, and XICE)[2] and

[1] Barber et al.'s Table VIII shows "Percentage Gross Monthly and Net Annual Returns Earned by Portfolios Formed on the Basis of Analyst Recommendations and Size, 1986 to 1996". Looking at the results of their large cap (Big) firm subset, they find gross monthly abnormal returns from the Fama-French-Carhart four-factor model of 0.251, 0.212, -0.022, -0.032, and -0.017 for portfolios 1, 2, 3, 4, and 5, respectively. Note that they take a short position in portfolios 3-5. Only portfolio 2 is statistically significant at a 10% level or lower. Net of transaction costs, all returns turn negative.

[2] The included stock exchanges in Nasdaq Nordic Main Markets are Stockholm, Copenhagen, Helsinki and Iceland.

the Oslo stock exchange (Oslo Børs). Hereafter, we refer to this collective group of exchanges as the Nordic Markets.

Our findings when evaluating the performance of consensus recommendations, show that stocks with favorable consensus recommendations consistently outperform their respective benchmarks, while stocks with unfavorable recommendations tend to underperform. These findings suggest that investing in an equally weighted portfolio consisting of the most favored stocks yields significant positive abnormal annual net returns, indicating that there is investment value in stock recommendations on companies traded in the Nordic markets. Furthermore, we cannot conclude that the impact of MiFID II has had a positive effect on performance.

The remainder of this paper is structured as follows: Section 2 features a discussion with prior relevant literature on the topic. Section 3 presents our dataset and sources. Section 4 contains the method employed and explains how we construct our variables and regressions. Section 5 presents our results. The obtained results will be used to analyze potential trading strategies with additional analysis in section 6. In section 7, we conclude our findings by discussing the implications. Additional tables are found in Appendix.

2. Prior literature

2.1 Investment value of stock recommendations

Cowles (1933), is one of the first to evaluate the investment value of stock recommendations. By analyzing the ability to forecast returns and predict future stock price levels of prominent financial services and insurance companies over four years, Cowles finds that recommendations do not outperform the market and neither generate positive abnormal returns. Additionally, analysts are unable to demonstrate expertise in offering investment advice.

Colker (1963) study a selection of brokerage houses from research studies reported in the Wall Street Journal. The findings also show a lack of expertise, as the advice given resulted in returns that were consistent with the average performance of the overall market. Similarly, Jensen (1968) examines the performance of mutual funds and finds that, on average, they were unable to predict equity prices well enough to outperform the overall market net of fees.

Diefenbach (1972) examines the stock selection made by a group of institutional brokerage houses throughout an 80-week window, assessing the investment value of their buy and sell recommendations. The findings show that the performance was below the market average, and was unable to find expertise in stock recommendations among institutional investors. Additional studies conducted by Logue, Tuttle (1973), and Bidwell (1977), have further supported the findings presented by Cowles (1933).

Desai and Jain (1995) study the performance of recommendations made by top-ranked and prominent money managers featured in Barron's Roundtable compared to the overall market returns. By using various holding periods ranging from 2 up to 750 days, covering a four-year period, they find that recommendations do not, on average, generate positive abnormal returns. In other words, the recommended stocks do not consistently outperform the market. The findings indicate that prominent money managers´ recommendations, both in terms of buying- and selling stocks, lack investment value.

However, other papers have contradicted these findings. Groth et al. (1979) examine one particular brokerage house's recommendations over a seven-year-long period, by using the

Capital Asset Pricing Model (CAPM)[3] to estimate abnormal returns. Their findings indicate that the recommendations indeed are valuable in stock selection and consistently outperform the overall market, even after accounting for transaction costs and risk. These findings are further supported by Bjerring et al. (1983).

Elton et al. (1986) examine the monthly impact of recommendation changes, upgrades (from a lower to a higher rating), and downgrades (from a higher to a lower rating). In particular, they analyze a dataset consisting of 720 analysts from 33 brokerage firms over a three-year period, intending to compare the average return on two equally weighted portfolios. One portfolio consisted of stocks that had been upgraded to "buy" or "strong buy" recommendations, while the other portfolio comprised stocks that had been downgraded to "sell" or "underperform" recommendations. They find positive abnormal returns for upgrades in the month following the recommendation, whereas downgrades resulted in negative abnormal returns.

Stickel's (1995) study contributes to the existing literature on up- and downgrades, by examining the price impact of changes in analyst recommendations over a four-year period. The findings indicate that recommendation changes from sell to buy (buy to sell), are accompanied by positive (negative) returns at the time of the announcement. Further, most of the price adjustments take place within the first 30 days following the recommendation change.

Similar to Elon et al. (1986), Womack (1996) examines how stock prices react to changes in analysts' upgrades and downgrades, adjusted for size, industry, and the Fama-French three-factor model.[4] They find that following a recommendation announcement, upgraded stocks added to buy drift increased on average by 2.4 percent, which holds up to three months, while downgraded stocks added to sell drift over a six-month period decreased on average by -9.1 percent.[5] The findings demonstrate that analysts' recommendation changes significantly influence stock prices and that stock prices after recommendation changes move

[3] According to CAPM, which was developed by Sharpe (1964) and Lintner (1965), a security's expected return depends on how sensitive it is to market risk. Investors are not compensated for firm-specific risk in the model, as such risk can be diversified away by investing in a sufficient number of securities.
[4] Fama and French's (1992) three-factor model extends the CAPM by including two additional factors, that account for company size and the connection between book equity and market equity. These two additional factors provide a more comprehensive assessment of "firm-specific" components of returns that can be achieved.
[5] Notably, (Womack 1996) noted that the returns are not substantially different using calendar month excess returns derived from the three-factor model of Fama and French (1993).

significantly towards analysts' forecasted recommendation direction.

In contrast to previous studies, Barber et al. (2001) examine whether investors can profit from consensus recommendations of equity analysts rather than individual recommendations. They construct consensus recommendations into portfolios 1-5, 1 representing strong buy and 5 strong sell. These portfolios were rebalanced daily and promptly adjusted in response to changes in recommendations. By using the Fama-French Method and controlling for market risk, size, book-to-market, and price momentum effects, the daily abnormal returns were calculated for each portfolio respectively.[6] Their findings conclude that purchasing stocks with the most (least) favorable consensus, results in annual positive (negative) abnormal gross returns greater than 4 (5) percent, after controlling for Fama-French factors and momentum factors.[7]

2.2 MiFID II regulation

In the light of the MiFID II framework, Lang et al. (2019) examine the impact of unbundling requirements of MiFID II on sell-side investment research. They find a decrease in sell-side analysts covering companies. Analysts also tend to issue more favorable recommendations and beatable earnings forecasts, suggesting that forecasts are more accurate. Similarly, Fang et al. (2020) examine MiFID II provisions on publicly traded firms in Europe and also find fewer analysts to cover a company. Additionally, they find an improvement in the accuracy of stock recommendations. These recommendations are more profitable and informative prior to the implementation of MiFID II. In contrast, Anselmi and Petrella (2021) also find an average decrease in analyst coverage is larger post-MiFID II, however, the extent of this decrease varies depending on the company's size.

Guo and Mota (2021) examine the impact of unbundle provision on the quality of analyst recommendations, by analyzing a large dataset of trading activity in European stock markets before and after the implementation of MiFID II. They find that the unbundling has increased

[6] Carhart (1997) added a momentum factor to the Fama-French three-factor model. This additional factor takes into consolidation for a higher abnormal Fama-French three-factor return of stocks that have a good past performance, compared to stocks with a poor past performance (Jegadeesh and Titman, 1993) and (Fama and French, 1996).

[7] Barber et al. use the four-factor model to asses wheter any superior returns that are documented are due to analysts' stock-picking ability or their choosing stocks with characteristics known to produce positive returns, rather then viewing these as risk factors per se.

research quality, measured as a decrease in forecast error on earnings per share estimates by analysts. This is due to increased competition among analyst providers, resulting in better research analysts being left in the markets.

Yihan et al. (2022) study the impact of analyst incentives on stock return synchronicity. They find a decrease in the average stock returns synchronicity with the market, implying an improvement in price informativeness. Specifically, they observe that analysts provide more accurate and higher-quality research, leading to a decrease in stock return synchronicity.

3. Data Description

3.1 Refinitiv Eikon

3.1.1 General

The data we use in this study is collected from the Refintiv Eikon database, which provides financial analysts' recommendations obtained from the Institutional Brokers' Estimate System (I/B/E/S). As the database provides daily analyst recommendations, we rebalance the portfolios for each day to replicate the approach of Barber et al. (2001).

The database provides a rating of 1 to 5, where a rating of 1 reflects strong buy recommendations, 2 a buy, 3 a hold, 4 a sell, and 5 a strong sell. However, analysts tend to use varying rating scales to convey the same meaning, such as a three-point scale or a dual-tiered system. In such cases, Eikon converts the ratings into a standardized five-point scale. Additionally, a company is excluded if the analysts decide to withdraw their recommendation and the company loses coverage. Given our relatively short sample period and the common industry practice that most recommendations have a one-year forward time horizon, we choose not to exclude companies that have not received a new recommendation in recent months.

3.1.2 Recommendations and other variables

We gather all analyst recommendations for companies in the Nordic main market that are covered and provided in the Eikon recommendations database. We download all available data from January 2016 until December 2019. In addition, the following variables are downloaded simultaneously: I/B/E/S recommendation code (the recommendation itself, standardized to a scale from one to five, with one signifying "strong buy" and five "strong sell"), I/B/E/S ticker (company identifier), ISIN codes (International Securities Identification Number), and company name.

Our dataset is limited to companies in the Nordic market that are listed on the Nasdaq Main market and Oslo stock exchange (Oslo Børs) through each year of our sample period. The data includes all tradable companies (small-, mid-, and large-cap), which consists of

companies across multiple industry groups with at least one recommendation on date τ.

Due to the inclusion of MiFID II and the impact of the pandemic-related disruptions in 2020, our dataset is limited to a period of four years, two years prior to the implementation of MiFID II, and two years following it.

We apply the following filters to our dataset to maintain reliability throughout our analysis. Firstly, we exclude companies that lack recommendations, as this is essential to calculate consensus. Secondly, we filter out companies with dual listings. Thirdly, we remove companies that lack ISIN codes (Further described in 3.2). Lastly, Refintiv Eikon includes the highest liquid share in dual-class structure companies.

3.1.3 Data issues and limitations

In certain cases, Refintiv Eikon may assign a later date to a recommendation submitted by an analyst before it becomes publicly available. This is observed by Bradley et al. (2014) and Ljungqvist et al. (2009), who find that analyst recommendations reported in I/B/E/S during trading hours are systematically delayed. These situations occur if the database utilizes the date of the written report's publication, even though the analyst had already publicly announced the recommendation earlier. If such circumstances occur, investors would have had the opportunity to act upon and benefit from the recommendation before the date recorded by Refinitv Eikon. Hence, our test for investment value is affected if this is a prevalent occurrence.

As our investment strategy involves investing in five different exchanges and currencies, there is an existing currency risk associated with the portfolios. An investor that wishes to engage in these investments will encounter exchange costs. Additionally, investors are exposed to exchange rate fluctuations due to factors such as interest rates, geopolitical events, and market sentiments. Consequently, these risks can impact portfolio returns. Frequent trading between exchanges will further amplify the impact of exchange cost and currency fluctuation. However, we have chosen not to incorporate currency risk in our model due to the difficulties of daily rebalancing the currency fluctuations and exchange costs across all three portfolios.

3.2 SHoF

After obtaining our recommendation from Refintiv Eikon, we merge it with the Swedish House of Finance Data Center (SHoF) for an overall data accuracy check. We use SHoF to determine whether a company belonged to the Nordic market on each particular day during our sample period. Next, we use ISIN codes to locate the corresponding companies in our datasets. Although most of the companies align with their respective ISIN codes, we conduct checks manually to verify the list of companies using their company names and tickers.

Furthermore, we control for companies with dual listings on the Nordic market for each day in our dataset. These are companies that are listed on multiple stock exchanges in addition to their primary exchange, such as both Sweden (OMXS) and Finland (OMX Helsinki). While Refinitiv Eikon filters out such companies, we manually control for their presence to maintain consistency in our dataset.

3.3 Factor returns

We download research factors for the Fama-French three factors, the Carhart four-factor model, and momentum, because these factors are necessary for calculating abnormal returns. In particular, we download monthly returns for these factors as “Fama-French Factors” from the Swedish House of Finance Data Center (SHoF). In addition, we also gather the risk-free rate at the beginning of each month, derived from the rate on treasury bills with one month until maturity from SHoF. All these factors and data are from the Swedish market as we approach it from the perspective of a Swedish investor.

3.4 Descriptive statistics

Table I

Descriptive Statistics on Analyst Recommendations collected from Refinitiv Eikon

The table shows our recommendation coverage of the Nordic Markets. A company is considered "covered" if, on a specific day, at least one analyst has an outstanding recommendation for that company. Sample market cap refers to all traded stocks for a particular company, including both class A and B as both are included in the total market cap. The total number of recommendations refers to the number of outstanding recommendations at a specific point in time. Market caps are denoted in billion SEK.

					Analysts per covered company		
Date	Listed companies	Covered companies	% of listed companies	Covered companies market cap	Mean	Median	Tot. no. of rec.
2016-12-31	866	404	46.65	11532.5	7.08	4	2526
2017-12-31	882	453	51.36	13751.5	6.34	4	2844
2018-12-31	904	476	52.65	12544.4	5.83	4	2387
2019-12-31	908	492	54.19	15545	4.58	3	2666
Average full period	890	456.25	51.21	13343.35	5.95	4	2605.75

As reported in columns two and three, the average number of covered companies is 456.25, while the total number of listed companies is 890. The relative difference can be explained by the different filters applied in our dataset, as mentioned previously. One possible explanation for the discrepancy is the absence of recommendations for certain companies which could be due to analysts not covering those particular companies. However, the number of companies covered in Refinitiv Eikon has consistently increased over the years, just like the number of listed companies.

In the fourth column, we observe that, on average, 51.21 percent of all companies in the Nordic markets have had at least one recommendation in Refintiv Eikon.

The fifth column in Table I shows the market cap of the covered companies in our sample. The market cap increases every year, except for the year 2018. This could be the result of the overall market declining by -0.04 percent (value-weighted) and -9.76 percent (equally weighted), as shown in Table AX in the appendix.

Columns “Mean” and “Median” present the average and median number of analysts per covered company. The median remains consistent every year. However, the average number of analysts decreases every year, declining from 7 to 4.5 over the years. On average, the number of analysts is 6.2, which is slightly higher than the value reported in Barber et al. (2001) sample (4.74 analysts per company).

As can be observed in the last column, it shows the total number of recommendations per year for all companies in the Nordic market. On average, there are approximately 2662 recommendations annually. We notice that the beginning of the year 2016 and 2017 has the highest number of recommendations. Subsequently, there is a decrease in the number of recommendations compared to previous years.

Table II

Descriptive Statistics on Analyst Recommendations collected from Refinitiv Eikon

The table reports mean and median consensus recommendations for the full sample, as well as for different sub-listings in each covered period.

	Full sample		Large-cap		Mid-cap		Small-cap	
Year	Mean	Median	Mean	Median	Mean	Median	Mean	Median
2016	2.53	2.92	2.62	2.86	2.39	1.83	2.61	1.67
2017	2.48	2.93	2.67	2.90	2.32	2.00	2.44	2.00
2018	2.40	2.99	2.58	2.87	2.22	2.00	2.38	2.00
2019	2.44	2.99	2.62	2.94	2.22	2.00	2.53	2.00
Full period	2.46	2.96	2.62	2.89	2.29	1.96	2.49	1.92

During the entire sample period, column two and three, reports a mean of 2.46 respectively 2.96 for the median. The mean value shows a consistent downward trend, possibly indicating that analysts have become more optimistic when providing recommendations. These findings are consistent with the results of Barber et al. (2001), who finds a mean value of 2.46 for the whole sample period. This reaffirms the argument in Barber et al. (2001) that analysts generally have a positive bias and are reluctant to issue sell recommendations.

After examining the full sample, one can observe the distinctions among the sub-listings. The mid-cap shows the lowest values compared to the large- and small-cap, potentially indicating

that analysts have a positive outlook toward these traded companies. Large-cap companies demonstrate the highest mean and median with values of 2.67 and 2.94 respectively. This could be explained empirically when taking in the “size-effect”, suggesting that analysts believe that mid-cap and small-cap traded companies tend to generally outperform large-cap companies.[8]

[8] See e.g. Fama & French (1992) for a more detailed discussion of the ”size-effect”.

4. Method

4.1 Portfolio construction

To evaluate the performance of analysts' stock recommendations in constructing portfolios, we download recommendations for each covered company directly. This consensus recommendation is derived from the average of all analysts' from I/B/E/S recorded in Refintiv Eikon. By adopting this approach, we don't have to manually calculate the consensus for each company.

Based on the steps above, Nordic companies are allocated to one of three portfolios. These portfolios include all covered stocks, which are determined based on the average consensus rating as of date τ. Companies with the most favorable consensus recommendation, "strong buy" and "buy", are placed in the first portfolio. The second portfolio consists of companies with an average consensus rating of "hold". The third and final portfolio includes companies with an average consensus rating of "sell" and "strong sell".

Table III
Portfolio Definitions

Portfolio	Definition
Portfolio 1 - "Buy"	$1 \leq Consensus_{i,\tau} \leq 2.5$
Portfolio 2 - "Hold"	$2.5 < Consensus_{i,\tau} \leq 3.5$
Portfolio 3 - "Sell"	$3.5 < Consensus_{i,\tau} \leq 5$

The number of portfolios chosen is a slight deviation from Barber et al. (2001), who divide their sample into five portfolios. The reason is twofold. Firstly, based on Barber et al. (2001) findings, we observe that the difference between the abnormal returns between the first and second portfolios (out of five), is relatively small for large companies when compared to medium-sized or small companies.[9] Secondly, the cutoffs are set so that the buy portfolio

[9] Barber et al.'s Table VIII shows "Percentage Gross Monthly and Net Annual Returns Earned by Portfolios Formed on the Basis of Analyst Recommendations and Size, 1986 to 1996". Looking at the monthly Fama-French-Carhart four-factor alpha estimates, the second portfolio has a coefficient relative to that of the first portfolio of 57% (0.327/0.575) for small companies, 58% (0.226/0.387) for medium-sized companies, and 84% (0.212/0.251) for big companies.

includes companies with consensus ratings reflecting strong buy and the sell portfolio includes strong sell recommendations. This is due to the relative infrequency of such consensus ratings, which in turn also reduces idiosyncratic exposure.

4.2 Value- and equally weighted portfolios

Having established the allocation of companies into appropriate portfolios, we proceed to calculate the weight of each company's portfolio. We construct two portfolios: value-weighted and equally weighted. To determine the weight of each company i in a portfolio on a given date τ, the market capitalization is divided by the market capitalization of all n number of companies in portfolio p. These calculations are based on the closing of the trading date τ, expressed as follows:

$$Weight_{i,\tau} = \frac{MarketCap_{i,\tau-1}}{\sum_{i=1}^{n_{p,\tau}} MarketCap_{i,\tau-1}} \quad (1)$$

We decide to use both value-weighted and equally weighted in our analysis due to the potential different results. Generally, equally weighted is commonly used and more convenient to use. However, it is important to factor in the economic hypothesis of interest. If the undervaluation is greater among small companies compared to large companies, the equally weighted approach is likely to find higher abnormal returns. This is because portfolio returns are a function of the variation of market capitalization. Consequently, given that small companies often generate higher abnormal returns, equally weighted returns are expected to outperform value-weighted systematically (Loughran and Ritter 2000). The equation for the Value-weighted returns for date τ can be expressed as follows:

$$r_{j,\tau}^{VW} = \sum_{i=1}^{n_{p,\tau}} Weight_{i,\tau} \cdot r_{i,\tau} \quad (2)$$

The r_j changes depending on if we are referring to the portfolio (r_p) or the benchmark (r_b). The value-weighted return on date τ is represented by $r_{j,\tau}^{VW}$, while the stock return for a

specific company on the same date is denoted by $r_{i,\tau}$. $Weight_{i,\tau}$ is the company's weight that we calculated using equation 1. The equally weighted return for the same portfolio and date is given by the following equation:

$$r_{j,\tau}^{EW} = \sum_{i=1}^{n_{p,\tau}} \frac{r_{i,\tau}}{n_{p,\tau}} \tag{3}$$

where the variable $n_{p,\tau}$ denoted the number of companies held in the portfolio p at the end of trading date τ.

4.3 Benchmarks

To evaluate if any of the portfolios generate marked adjusted returns, we compare the monthly returns for value-weighted and equally weighted against appropriate benchmarks. Subsequently, we construct corresponding benchmarks rather than using existing market indexes. This approach is necessary since we are examining companies in five different exchanges, and there is no existing index that covers the Nordic markets. The monthly benchmarks are then compared with the portfolio returns to determine each of the portfolio's market-adjusted returns. Both benchmarks are constructed so that they only include companies for which recommendations are available on the given date. The equations for the returns are to be found on the previous page.

4.4 Turnover and transaction costs

Since we are evaluating the performance and profit potential in trading based on analysts' consensus recommendations, it is necessary to factor in the trading cost that the investor will incur. The cost typically includes bid-ask spread, commission fees charged by brokers, and the market impact of trading (Barber 2001). However, estimating these costs can be challenging as they may differ depending on investment style. Thus, to measure the cost, it is essential to calculate the turnover for each of the three portfolios, which refers to the proportion of the portfolio that has been sold and replaced with other stocks during that trading day.

The initial step to compute the turnover involves a three-step procedure employed by Barber et al. (2001). That is to find the hypothetical portfolio weight a company would have had on date τ, as if there had been no portfolio rebalancing. The hypothetical weight, denoted $G_{i,\tau}$ is calculated for each stock i and date τ. $G_{i,\tau}$, represents the portfolio weight of stock i on date τ-1. The other variable $r_{i,\tau}$, corresponds to the return of stock i on date τ. The denominator of Equation 4 is simply the sum of the nominator for all stocks n that were in the same portfolio p as stock i on date $\tau - 1$. The equation can be expressed as follows:

$$G_{i,\tau} = \frac{Weight_{i,\tau-1} \cdot (1+r_{i,\tau})}{\sum_{i=1}^{n_{p,\tau}} Weight_{i,\tau-1} \cdot (1+r_{i,\tau})} \tag{4}$$

Having calculated the hypothetical portfolio weight without rebalancing, denoted as $G_{i,\tau}$, we proceed to compare them it with the actual weights $F_{i,\tau}$. That is, for each stock that was part of the portfolios at the end of the trading date τ, we calculate the difference between the hypothetical share and the actual share in the portfolio. Representing the portfolio's daily turnover, the percentage decrease in the covered stocks on each date is then summed. The equation is given by:

$$U_{i,\tau} = \sum_{i=1}^{n_{p,\tau}} max\left\{G_{i,\tau} - F_{i,\tau}, 0\right\} \tag{5}$$

Finally, to obtain the annual turnover, we multiply the average daily portfolio turnover, $U_{i,\tau}$ by 250 (an approximation of trading days in a year). The annual turnover rate is then multiplied by a transaction cost estimate, reflecting the sum of both the cost to buy and sell a stock. While brokerage commissions are relatively small for institutions (Barber et al. 2001) and around 1.4 percent for private investors (Barber and Odean 2000), it is important to consider transaction costs to obtain a realistic view of portfolio performance. The bid-ask spread is narrower for large-cap stocks than it is for small-cap stocks (Keim and Madhavan 1998). However, previous studies, such as Carhart (1997) for institutions and Barber and Odean

(2000) for private investors, have estimated the round-trip cost of the bid-ask spread of a portfolio consisting of all covered stocks to be approximately 1 percent. For private investors, this corresponds to a transaction cost estimate of approximately 2.4 percent of the portfolio annual turnover. In contrast, institutional investors face a transaction cost of 1 percent.

4.5 Performance evaluation

4.5.1 Consensus recommendations performance

Having computed monthly portfolio and benchmark returns, we proceed to determine the market-adjusted returns earned by every portfolio. This involves comparing the returns of value-weighted and equally weighted to their corresponding benchmarks, in order to evaluate the performance and establish potential trading strategies based on analyst recommendations. The equation for the value-weighted and the equally weighted market-adjusted return is as follows:

$$MAR_{p,t} = r_{p,t} - r_{b,t} \tag{6}$$

To assess the statistical significance of the market-adjusted returns, we conduct four statistical tests. We start off by performing a t-test to examine the significance of the means between the returns of the portfolio and the benchmark. We test at a significance level of $\alpha = 0.10$, as the significance level is standard in previous studies.

4.5.2 Testing for abnormal returns

To calculate if the portfolios yield any abnormal returns, we regress the monthly portfolio excess returns against three asset-pricing models, specifically the Fama-French-Carhart four-factor model (FFC), the Fama-French three-factor model (FF), and the Capital Asset Pricing Model (CAPM). First off we have the Fama-French-Carhart four-factor model:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_p(r_{mrkt,t} - r_{f,t}) + s_p \cdot SMB_t + h_p \cdot HML_t + m_p \cdot MOM_t + \varepsilon_{p,t} \tag{7}$$

$r_{p,t}$ represent the return of the portfolio for a specific month, t. $r_{f,t}$ refers to the risk-free rate at the beginning of each month t, derived from the rate on Swedish treasury bills with one month until maturity. Moving on to the right-hand side we have α_p, which is the intercept of the regression, commonly referred to as Jensen's alpha. Following that is β_p, which stands for the coefficient on the market excess return, also known as the market beta. $r_{mrkt,t}$ refers to to the return of our benchmark portfolio. The SMB_t factor accounts for the historical evidence that small-cap stocks tend to outperform large-cap stocks over time. It measures the difference by taking the return of a portfolio of small-cap stocks and subtracting the return of a portfolio of large-cap stocks. The HML_t factor is the historical observation that stocks with low price-to-book ratios tend to outperform stocks with high price-to-book ratios. It takes the difference by taking the return of a portfolio consisting of stocks with low price-to-book ratios and subtracting the return of a portfolio consisting of stocks with high price-to-book ratios (Fama and French 1992). Lastly, the momentum factor, MOM_t, considers the observation that stocks that have previously shown positive returns tend to continue performing well, while stocks with a past of negative returns tend to continue underperforming. Similarly, it takes the return of a portfolio comprising stocks that have previously shown high returns and deduct the return of a portfolio consisting of stocks that have previously shown low returns (Carhart 1997). $\varepsilon_{p,t}$ is the error term of the regression.

The Fama-French three-factor includes the same factors as the four-factor model, except for the momentum factor MOM_t.

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_p(r_{mrkt,t} - r_{f,t}) + s_p \cdot SMB_t + h_p \cdot HML_t + \varepsilon_{p,t} \quad (8)$$

Lastly, the Capital Asset Pricing Model is similar to both previous models, but excludes MOM_t, SMB_t, and HML_t.

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_p(r_{mrkt,t} - r_{f,t}) + \varepsilon_{p,t} \quad (9)$$

5. Results

5.1 Portfolio characteristics

Table IV
Descriptive characteristics for portfolios formed based on consensus recommendations

The table presents descriptive statistics for all portfolios. Specifically, it shows the average and relative number of companies in each portfolio, as well as the average total market capitalization in the respective portfolios. Also displayed, is the average number of analysts covering companies in the respective portfolios, and every portfolio's average consensus recommendation. Annual turnover rates are shown on the right-hand side of the table. Values of capitalizations are denoted in billion SEK.

Portfolio	No. of companies	% of companies	Market cap SEK	% of Market cap	No. of analysts per company	Average rec.	Turnover rate in %
Buy	267.23	59.70	5365	31.63	6.56	1.98	201.45
Hold	147.2	32.88	8353	49.24	6.66	2.97	263.10
Sell	33.20	7.42	3244	19.13	5.07	4.04	624.19
All covered	447.65	100	16962	100	6.10	2.46	

As observed in Table IV, it is evident that the proportion of covered companies in the buy portfolio is higher than in any of the other portfolios. On average, 60 percent of all allocated companies are covered, alongside an average market capitalization of 32 percent. When considering the varying number of analysts per company, the buy portfolio has the second highest analyst coverage with an average of 6.56. The allocation of companies in the buy portfolio further confirms that it mainly comprises companies with medium and small market caps. Notably, analysts tend to be more optimistic and issue favorable recommendations for companies with small to medium market caps, as supported by the descriptive statistics presented in Table II.

In contrast, the sell portfolio has the smallest proportion among all covered companies, averaging 7.5 percent of the total number of companies. It also demonstrates the lowest average market capitalization of 19.13 percent and the lowest number of covered analysts per company of 5.07. The covered companies allocated to the sell portfolio are mainly large-cap companies. The proportion of total covered companies allocated in the sell portfolio, indicates a strong sell reluctance, as it is several times smaller compared to the largest portfolio, which

also is confirmed by Stickel (1995), Womack (1996), and Barber Barber et al. (2001). This can partially be explained by the tendency of analysts to avoid covering stocks that consistently receive sell recommendations, particularly for underperforming companies, and that most investors are looking for buy recommendations (Desai and Jain 1995).

However, with a substantially higher market cap, approximately 50 percent, and comprising 33 percent of the covered companies, it confirms that there are larger companies allocated in the hold portfolio compared to the buy portfolio. Additionally, when considering the aggregated market cap, which is approximately half the total covered market cap, it further confirms the allocation.

The annual turnover of each recorded portfolio varies from 201 percent for the buy portfolio to a high 624 percent for the sell portfolio. The hold portfolio's turnover of 263 percent, is relatively similar to the buy portfolio's. The lower observed turnovers for the buy portfolios and the sell portfolios indicate that stocks do not experience frequent changes. Conversely, the sell portfolio's high turnover is presumably due to fewer companies that will have a substantial impact when changing between portfolios.

5.2 Returns

Table V

Percentage monthly returns earned by portfolios formed based on analyst recommendations.

The mean percentage of monthly returns earned by each portfolio is referred to as raw returns. Market-adjusted returns are the mean raw returns minus the return on a value-weighted or an equally weighted index. The Buy-Sell portfolio refers to a spread strategy where you go long on the buy portfolio and short on the sell portfolio. The CAPM intercept is the estimated intercept resulting from a time-series regression of the portfolio return ($r_p - r_f$) on the market excess return ($r_{mrkt} - r_f$). Likewise, the Fama-French three-factor model's intercept is the estimated intercept produced from a time-series regression of the portfolio return on the market excess return ($r_{mrkt} - r_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four-characteristic intercept is computed by incorporating a zero-investment momentum portfolio (MOM) as an independent variable. Each t-statistic corresponds to the null hypothesis that the associated return equals zero. T-statistics for returns that are statistically significant at the 10% level or better are presented in bold.

	VW					EW				
Portfolio	**Mean raw return**	**Market adj. return**	**CAPM Intercept**	**FF Intercept**	**FFC Intercept**	**Mean raw return**	**Market adj. return**	**CAPM Intercept**	**FF Intercept**	**FFC Intercept**
Buy	1.31	0.08	0.06	0.49	0.49	1.34	0.34	0.42	1.16	1.00
		(-2.45)	(0.36)	(1.37)	(1.29)		**(-2.00)**	**(2.89)**	**(2.98)**	**(2.58)**
Hold	1.15	−0.09	0.23	0.57	0.69	0.42	−0.58	−0.46	0.20	0.12
		(-2.97)	(1.32)	**(1.93)**	**(2.27)**		**(-1.97)**	**(−2.46)**	(0.49)	(0.30)
Sell	0.97	−0.27	−0.26	0.17	0.28	1.14	0.14	0.30	1.19	1.11
		(-1.40)	(−0.44)	(0.26)	(0.41)		(-0.85)	(0.37)	(1.20)	(1.08)
Buy-Sell	0.34	0.34	0.32	0.32	0.20	0.20	0.20	0.11	-0.04	-0.11
		(-1.34)	(0.51)	(0.50)	(0.31)		(-0.79)	(0.13)	(-0.03)	(-0.11)

The main results of our analysis on whether analysts' recommendations have investment value are summarised in Table V. For the value-weighted buy portfolio, consisting of the most favored stocks, we find monthly average raw returns of 1.31 percent, whereas the sell portfolio, which comprised the least favored stocks, had a corresponding raw return of 0.97 percent. This suggests that, on average, the most favored stocks outperform the least favored ones by 0.34 percentage points. Additionally, we observe that the hold portfolio outperforms the sell portfolio, but underperforms the buy portfolio. This suggests decreasing raw returns as we move from the most favorable to the least favorable portfolios. This is consistent with

Barber et al. (2001) finding. However, when considering the equally weighted portfolios, we observe that the hold portfolio has a mean raw return of 0.42 percent, which is lower than both the most and least favorable portfolios. We observe unexpected results, as this deviates from the pattern observed in the value-weighted portfolios. Furthermore, we noted the monthly spread in equally weighted portfolios (0.92 percent), is substantially larger than in the value-weighted portfolios (0.34 percent).

Moreover, the market-adjusted returns, defined as a specific portfolio's mean monthly raw return less the monthly mean return of the benchmark, are different between the two portfolio weighings. The buy portfolio in both portfolio weighting schemes has the highest significant abnormal returns. Both the hold and the sell portfolios show negative market-adjusted returns, except for the equally weighted sell portfolio. Similar to the raw returns, there is a consistent decrease as we move from the most favorable to the least favorable portfolios, except for the equally weighted sell portfolio. We find that the more favorable portfolios consistently outperform the least portfolios in both portfolio weighting schemes.

Figure I

Cumulative equally weighted market-adjusted returns

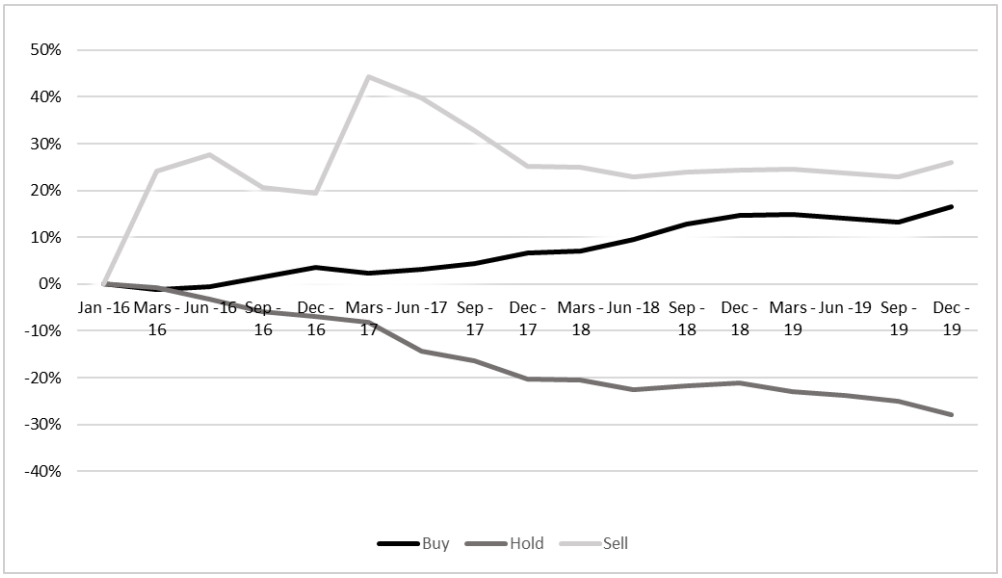

Figure I illustrates the cumulative market-adjusted return for the equally weighted portfolios. It is evident that the sell portfolio delivers impressive returns and outperforms both the buy portfolio and the hold portfolio in the initial quarters. The buy portfolio demonstrates a consistent increase in cumulative returns, as expected from the most favorable portfolio. On

the other hand, the hold portfolio shows a steady decrease, indicating consistent underperformance compared to its benchmark.

In the value-weighted portfolios shown in Figure AI in the appendix, we observe that while the hold portfolio shows strong performance in the initial months, the buy portfolio surpasses the other portfolios over time. However, unlike the steady increase seen in Figure I, the buy portfolio's performance fluctuates between 3 and 6 percent after the first year. Over the four years, the buy portfolio achieves a cumulative market-adjusted return of 3.81 percent, while the sell portfolio generates a negative return of 10.61 percent.

One might suspect that the market-adjusted returns can be explained by the market risk, size, book-to-market, and price momentum characteristics of the stocks in the portfolios. The results obtained from conducting intercept from CAPM, the Fama-French three-factor model (FF), and the four-characteristics model (FFC) regressions, indicates that the buy portfolio has higher abnormalities compared to the sell portfolio across all models, except for FF and FFC in equally weighted. Surprisingly, for the value-weighted portfolios, we find that the abnormal returns for the hold portfolio are larger than those in the buy portfolio across all models, however, only the FF and FFC for the hold portfolio are significant while non of the intercepts for the buy portfolio are. Furthermore, all intercepts demonstrate statistical significance for the equally weighted buy portfolio, while only CAPM is significant for the hold portfolio.

An investor can implement a spread strategy within CAPM in value-weighted by going long on the buy portfolio and going short on the sell portfolio. This strategy would yield an average monthly return of 0.32 percent, however statistically insignificant.

5.3 The impact of MiFID II

To assess whether MiFID II has any impact on performance, we divide our dataset into two periods: pre- and post-MiFID II. The first period, pre-MiFID II, spans from January 2016 - December 2017, and the second period, post-MiFID II, covers January 2018 - December 2019. To analyze the effects, we estimate separate regression for each sub-set and allow coefficients of each factor to vary across the two periods.

Table VI

Percentage monthly returns earned by portfolios formed based on analyst recommendations, 2016-2017 (Pre-MiFID II)

The mean percentage of monthly returns earned by each portfolio is referred to as raw returns. Market-adjusted returns are the mean raw returns minus the return on a value-weighted or an equally weighted index. The Buy-Sell portfolio refers to a spread strategy where you go long on the buy portfolio and short on the sell portfolio. The CAPM intercept is the estimated intercept resulting from a time-series regression of the portfolio return ($r_p - r_f$) on the market excess return ($r_{mrkt} - r_f$). Likewise, the Fama-French three-factor model's intercept is the estimated intercept produced from a time-series regression of the portfolio return on the market excess return ($r_{mrkt} - r_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four-characteristic intercept is computed by incorporating a zero-investment momentum portfolio (MOM) as an independent variable. Each t-statistic corresponds to the null hypothesis that the associated return equals zero. T-statistics for returns that are statistically significant at the 10% level or better are presented in bold.

	VW					**EW**				
Portfolio	**Mean raw return**	**Market adj. return**	**CAPM Intercept**	**FF Intercept**	**FFC Intercept**	**Mean raw returns**	**Market adj. return**	**CAPM Intercept**	**FF Intercept**	**FFC Intercept**
Buy	1.4	0.21	0.27	0.67	0.57	1.53	0.27	0.51	0.94	0.79
		(−1.94)	(0.9)	**(2.12)**	**(2.17)**		**(−2.17)**	**(2.72)**	**(3.02)**	**(2.38)**
Hold	1	−0.20	0.24	0.80	0.88	0.40	−0.85	−0.65	−0.27	−0.31
		(-2.15)	(0.72)	**(2.40)**	**(2.52)**		**(−1.79)**	**(-1.86)**	(−0.46)	(−0.47)
Sell	0.81	−0.39	-0.3	0.11	0.14	2.30	1.05	1.6	2.21	2.53
		(-1.27)	(-0.46)	(0.16)	(0.20)		(-0.58)	(0.97)	(1.14)	(1.14)
Buy-Sell	0.60	0.60	0.57	0.56	0.43	-0.77	–0.78	-1.09	-1.27	-1.74
		(-1.18)	(0.80)	(0.78)	(0.57)		(-0.54)	(-0.61)	(-0.64)	(-0.77)

Table VII

Percentage monthly returns earned by portfolios formed based on analyst recommendations, 2018-2019 (Post-MiFID II)

The mean percentage of monthly returns earned by each portfolio is referred to as raw returns. Market-adjusted returns are the mean raw returns minus the return on a value-weighted or an equally weighted index. The Buy-Sell portfolio refers to a spread strategy where you go long on the buy portfolio and short on the sell portfolio. The CAPM intercept is the estimated intercept resulting from a time-series regression of the portfolio return ($r_p - r_f$) on the market excess return ($r_{mrkt} - r_f$). Likewise, the Fama-French three-factor model's intercept is the estimated intercept produced from a time-series regression of the portfolio return on the market excess return ($r_{mrkt} - r_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four-characteristic intercept is computed by incorporating a zero-investment momentum portfolio (MOM) as an independent variable. Each t-statistic corresponds to the null hypothesis that the associated return equals zero. T-statistics for returns that are statistically significant at the 10% level or better are presented in bold.

	VW					**EW**				
Portfolio	**Mean raw return**	**Market adj. return**	**CAPM Intercept**	**FF Intercept**	**FFC Intercept**	**Mean raw returns**	**Market adj. return**	**CAPM Intercept**	**FF Intercept**	**FFC Intercept**
Buy	1.21	0.05	−0.11	0.32	0.46	1.15	0.41	0.41	0.02	0.03
		(-1.57)	(−0.50)	(0.45)	(1.00)		(0.90)	**(2.02)**	(0.02)	(0.05)
Hold	1.29	0.03	0.29	0.65	0.81	0.43	−0.32	−0.25	−0.73	−0.73
		(-2.03)	**(2.05)**	(1.34)	(2.01)		(-0.99)	(−1.54)	(−1.20)	(−1.17)
Sell	1.12	−0.14	−0.18	0.34	0.57	−0.02	−0.76	−0.76	−1.36	−1.34
		(−0.84)	(−0.18)	(0.27)	(0.42)		(-0.83)	**(−2.28)**	**(−1.92)**	**(−1.95)**
Buy-Sell	0.09	0.19	0.07	-0.02	-0.11	1.17	1.17	1.16	1.37	1.37
		(-0.81)	(0.07)	(-0.02)	(-0.09)		(-0.81)	**(3.07)**	**(3.10)**	**(3.03)**

In column two, the monthly gross geometric mean return for each of the three portfolios: buy, hold, and, sell are prestented. We find that all portfolios have a positive gross geometric mean return for each of the periods, except for the equally weighted sell portfolio's second period. However, the returns vary across these periods. The buy portfolio outperforms its equivalent in the second period. In contrast, the hold and the sell portfolios outperform their equivalent in the first period, with the expectation of the equally weighted sell portfolio. We also observe that the more favorable portfolio outperforms the least favorable in both periods, which aligns with the findings of Barber et al. (2001).

Furthermore, when analyzing the market-adjusted returns for both periods, only the buy

portfolio generates positive market-adjusted returns for both weighings. Conversely, the hold and the sell portfolios generate negative market-adjusted returns, except for the equally weighted sell portfolio's first period. The largest differences in returns between the periods are observed within the equally weighted sell portfolio. During the first period for this portfolio, the monthly market-adjusted returns are on average 1.05 percent, while the second period shows a negative abnormal return of 0.76 percent. As stated in the descriptive data, the covered companies within the buy portfolio are mainly small- to mid-cap companies that generate high returns.

The significant intercepts are different across the first period. The absence of statistical significance can especially be found in the second period. Market-adjusted returns for the buy portfolios and hold portfolios are significant at a 10 percent level for both weightings in the first period. However, apart from the hold portfolio in value-weighted's second period, none of the other portfolios remain significant.

In the pre-MiFID II period, when analyzing the intercepts obtained from the CAPM, FF, and FFC regressions, it becomes evident that the value-weighted buy portfolio shows higher abnormal returns than the sell portfolio in all cases. Surprisingly, when considering the equally weighted counterparts, the pattern is the opposite, with the sell portfolio displaying higher abnormal returns than the buy portfolio. This finding is unexpected since the sell portfolio would typically be expected to have lower intercepts. However, none of the intercepts in the sell portfolio demonstrate statistical significance.

Turning to the post-MiFID II period, we observe notable changes in the intercept of the portfolios in both weighings. Specifically, for the equally weighted buy portfolio, the only intercept that remains significant is CAPM. However, in this period, all intercepts for the equally weighted sell portfolio show significance, which is in contrast to the previous period where none of the intercepts were significant. Additionally, we discover that the spread strategy involving going long on the buy portfolio and short on the sell portfolio, is statistically significant for the equally weighted portfolio, implying that an investor could potentially profit by implementing this strategy.

6. Additional analyses

6.1 Performance against benchmarks

Additionally, a question that arises is how the portfolios perform against their respective benchmark on a monthly average. By observing Table VIII, the most recommended stocks in the buy portfolio outperform both weightings in slightly over 60 percent of the months. When it comes to the hold and the sell portfolios, their performance against the benchmark shows no large difference over the months. Both portfolios underperform the benchmark by roughly the same percentage in value-weighted. However, in equally weighted portfolios, the variance in underperformance against their benchmark amounts to approximately 8 percent of the months for the hold portfolio and the sell portfolio respectively.

Table VIII

Value- and Equally weighted portfolios performance against benchmark

The table shows how the sample portfolios perform against their respective benchmarks. OVER is defined as the percentage number of months in which the specific portfolio earns above benchmark returns, whereas UNDER is months in which returns are less than the benchmark.

	VW		EW	
Portfolio	**% Over**	**% Under**	**% Over**	**% Under**
Buy	64.58	35.42	60.42	39.58
Hold	45.83	54.17	25.00	75.00
Sell	43.75	56.25	33.33	66.67

Based on the market-adjusted returns in Table V, the buy portfolio significantly outperforms its respective benchmarks across both portfolio weights. However, the remaining portfolios do not remain statistically significant in their performance.

Furthermore, when looking at the performance of the portfolios against their benchmark in the periods, the buy portfolio consistently outperforms the benchmark in both weightings across the sample months. Conversely, the sell portfolio underperforms the benchmark in both periods, except for the value-weighted in the second period. The same pattern is

observed in the hold portfolio.

Table IX

Value- and equally weighted portfolios performance against benchmark, Pre-MiFID II

The table shows how the sample portfolios perform against their respective benchmarks pre-regulation. OVER is defined as the percentage number of months in which the specific portfolio earns above benchmark returns, whereas UNDER is months in which returns are less than the benchmark.

Pre-MiFID II	VW		EW	
Portfolio	% Over	% Under	% Over	% Under
Buy	79.17	20.83	58.33	41.67
Hold	37.50	62.50	20.83	79.17
Sell	37.50	62.50	33.33	66.67

Table X

Value and equally weighted portfolios performance against benchmark, Post-MiFID II

The table shows how the sample portfolios perform against their respective benchmarks post-regulation. OVER is defined as the percentage number of months in which the specific portfolio earns above benchmark returns, whereas UNDER is months in which returns are less than the benchmark.

Post-MiFID II	VW		EW	
Portfolio	% Over	% Under	% Over	% Under
Buy	50.00	50.00	62.50	37.50
Hold	54.17	45.83	29.17	70.83
Sell	50.00	50.00	33.33	66.67

However, the market adjusted returns and the different intercepts are significantly different across periods, also displayed in Table VI and VII. In the first period of both weightings, going long on the buy portfolio significantly outperforms benchmarks. A similar pattern is also observed in the hold portfolio.

6.2 Bull and bear market returns

Another question that emerges is whether the performance of stock recommendations is driven by a strong market. Therefore, to examine this matter, we analyze the impact on portfolio returns of months characterized by bull and bear market conditions.

A bull month prevails when the sample benchmark (Value- and equally weighted) return is positive, while a bear month is one in which the sample benchmark returns are negative.

Table XI

Value- and equally weighted portfolio performance in different market conditions

The table shows how the sample portfolios perform in different market conditions (Bull and Bear markets). OVER is defined as months when the specific portfolio yields above benchmark returns, whereas UNDER is defined as months when the specific portfolio yields a return less than the benchmark. At the bottom of the table, the different market conditions are presented as a percentage of all months´.

	VW				EW			
	Bull Months		Bear Months		Bull Months		Bear Months	
Portfolio	% Over	% Under	% Over	% Under	% Over	% Under	% Over	% Under
Buy	63.89	36.11	66.67	33.33	64.71	35.29	64.29	35.71
Hold	33.33	66.67	75.00	25.00	20.59	79.41	42.86	57.14
Sell	47.22	52.78	33.33	66.67	29.41	70.59	42.86	57.14
	75		25		70.83		29.17	

The frequency of the bull market is much higher in both weightings. On average, 75 percent of the months are categorized as bull markets in the value-weighted benchmark, and approximately 71 percent of the months are classified as bull markets in the equally weighted benchmark.

Observing the performance of both weighted portfolios, the buy portfolio consistently outperforms the benchmark in both bull and bear market conditions. This suggests that analysts can identify companies that perform better than the market, even during declining markets, which is supported by Fama (1991). However, the sell portfolio underperforms the benchmark, given that the sample months comprise predominantly bull markets for both weightings. This indicates a tendency for analysts to identify underperforming companies during declining markets, consistent with the findings of Stickel (1995) and Womack (1996). The portfolio demonstrates different performance patterns in the two weighted portfolios, indicating that it underperforms the benchmark to a greater extent in both market conditions.

Table XII

Value- and equally weighted portfolio performance in different market conditions, Pre-MiFID II

The table shows how the sample portfolios perform in different market conditions (Bull and Bear markets). OVER is defined as months when the specific portfolio yields above benchmark returns, whereas UNDER is defined as months when the specific portfolio yields a return less than the benchmark. At the bottom of the table, the different market conditions are presented as a percentage of all months´.

	VW				EW			
Pre-MiFID II	Bull Months		Bear Months		Bull Months		Bear Months	
Portfolio	% Over	% Under	% Over	% Under	% Over	% Under	% Over	% Under
Buy	78.95	21.05	80.00	20.00	55.56	44.44	83.33	16.67
Hold	26.32	73.68	80.00	20.00	22.22	77.78	16.67	83.33
Sell	36.84	63.16	40.00	60.00	33.33	66.67	33.33	66.67
	79.17		20.83		75.00		25.00	

In the distribution of bull and bear pre-MiFID II, we can observe that 79 percent of the value-weighted portfolio months over a 24-month period are categorized as bull market, while the equally weighted comprises 75 percent. Analyzing the value-weighted portfolios, we find that during bull markets, both the buy and hold portfolios generate returns above their benchmark in 80 percent of the months. In bear markets, the hold portfolio outperforms the benchmark in only 26 percent of the months, whereas the buy portfolio outperforms in 79 percent of the months. However, since the pre- and post-MiFID II period only consists of 24 months each, we refrain from drawing any conclusions.

When analyzing the equally weighted portfolios, we observe that the buy portfolio shows similar patterns as the value-weighted portfolio during bull markets. However, the hold portfolio has the complete opposite distribution, with only 17 percent of the months outperforming the market. The distribution of over/under for the sell portfolio is comparable between the equally weighted portfolio and its value-weighted counterpart.

Table XIII

Value- and equally weighted portfolio performance in different market conditions, Post-MiFID II

The table shows how the sample portfolios perform in different market conditions (Bull and Bear markets). OVER is defined as months when the specific portfolio yields above benchmark returns, whereas UNDER is defined as months when the specific portfolio yields a return less than the benchmark. At the bottom of the table, the different market conditions are presented as a percentage of all months.

	VW				EW			
Post-MiFID II	Bull Months		Bear Months		Bull Months		Bear Months	
Portfolio	% Over	% Under	% Over	% Under	% Over	% Under	% Over	% Under
Buy	47.06	52.94	57.14	42.86	75.00	25.00	50.00	50.00
Hold	41.18	58.82	71.43	28.57	18.75	81.25	62.50	37.50
Sell	58.82	41.18	28.57	71.43	25.00	75.00	50.00	50.00
	70.83		29.17		66.67		33.33	

In the post-MiFID II period, we observe that similar to pre-MiFID II, there are more months of a bull market (71 percent for value-weighted, and 67 percent for equally weighted). Analyzing the new over/under distribution, we observe a more balanced distribution compared to the pre-MiFID II period, with fewer large spreads between over and under. In contrast to expectations, we see that the value-weighted sell portfolio in a bull market performs better than the benchmark in 59 percent of the months. This suggests that analysts were inaccurate in predicting which company to sell when the market return is positive. However, the equally weighted counterpart only outperforms the benchmark in 25 percent of the months.

6.3 Trading costs

All the returns analyzed thus far have been reported without taking into account transaction costs, which is a crucial aspect of pursuing an active investment strategy. Observing Table IV, we see that the annual turnover for the buy portfolio is 201.45 percent, which means that the transaction cost for private investors is 4.83 percent and 2.01 percent for institutions.

To begin our analysis, we initially examine the portfolios individually. When we review the value-weighted portfolios for all covered stocks in Table AI in the appendix, we observe that

institutional investors achieve the highest raw return net of transaction costs in the buy portfolio. the buy portfolio yields a return of 13.75 percent for institutions and 10.93 percent for private investors. However, when we consider the market-adjusted return of this portfolio, we observe returns of -1.06 percent for institutions and -3.88 percent for private inventors, respectively. These market-adjusted returns are statistically significant at the 10 percent level.

Observing the equally weighted portfolios in Table AII, we find both the buy portfolio's and the sell portfolio's market-adjusted returns to be statistically significant. For the buy portfolio, we observe positive market-adjusted return net of transaction costs, with private investors earning 1.71 percent and institutions earning 4.03 percent. These findings support the suggestion that equally weighted portfolios are expected to consistently outperform value-weighted portfolios (Loughran and Ritter 2000). However, none of the other portfolios have positive market-adjusted returns when accounting for annual turnover and transaction costs. Based on the data observed in Table AI and AII**,** all portfolios have a positive average raw return during our period. This suggests no opportunities for short-selling any of the portfolios

7. Conclusion

The objective of this thesis is to examine the investment value of stock recommendations provided by different brokerage houses for stocks traded on the Nordic markets. In section 1, three hypotheses were formulated, drawing upon prior research and our intuitive understanding. By analyzing empirical findings and conducting further analysis, this study presents the outcomes corresponding to the hypotheses.

When evaluating the first hypothesis, we find that stocks with favorable consensus recommendations tend to outperform their respective benchmarks, while those with unfavorable recommendations tend to underperform. This aligns with Groth et al. (1979, who also finds that recommendations have value and consistently outperform the market. Regression analysis further supports these observations, with statistically significant results observed for the equally weighted buy portfolio, although the value-weighted counterpart's intercepts lack statistical significance. However, the market-adjusted returns for the value-weighted buy portfolio are statistically significant. The intercepts and market-adjusted returns for the equally weighted sell portfolio are not statistically significant at the 10 percent level, which makes us doubt the accuracy of the performance of that portfolio. Our findings suggest that, despite some portfolios showing statistical insignificance, stocks with the highest consensus recommendations generate positive market-adjusted returns, while those with the lowest recommendations generate negative market-adjusted returns, with one exception, the equally weighted sell portfolio. This aligns with the previous conclusion by Elon et al. (1986), and Womack (1996).

The findings from the sample period demonstrate that the most favorable value-weighted (equally weighted) portfolio has a mean annual gross return of 15.76 (16.09) percent. In contrast, the least favorable yield a gross return of 11.62 (13.71) percent (See Table AI and AII). Further, we find that, after accounting for transaction cost, an institutional investor experiences a negative annual market-adjusted return of -1.06 percent when going long on the value-weighted buy portfolio, which aligns with Barber et al. (2001) findings. The same portfolio would for a private investor earn a negative market-adjusted return of -3.88 percent. Shifting our focus to the equally weighted portfolios, we note a contradiction to our second hypothesis. Both the private and institutional investors would earn a positive market-adjusted return of 1.71 percent and 4.03 percent, respectively when going long on the buy portfolio.

These results shed light on the influence of transaction costs on market-adjusted returns, indicating varying outcomes depending on the investor type and portfolio composition. In conclusion, it is evident that recommendations for Nordic market-traded stocks hold investment value.

Regarding the third hypothesis, our objective is to examine whether the abnormality of returns would increase following the implementation of MiFID II. To assess this, we initially compare the values which are significant for both pre-and post-MiFID II periods, the market-adjusted return for the value-weighted hold portfolio, and the equally weighted buy portfolio's CAPM. In the former, we observe a result that is in line with our hypothesis; the market-adjusted return increases post-introduction. However, the equally weighted buy portfolio demonstrates the opposite trend, with a decrease in CAPM abnormal return post-introduction. Fang et al. (2020) conclude that stock recommendations are more profitable after the implementation of MiFID II, however, as we proceed to compare the remaining values, we cannot observe a distinct pattern as some values increase and others decrease. Additionally, since most of the values lack statistical significance, we refrain from making direct comparisons. In summary, while there is evidence to support our hypothesis in the case of the value-weighted hold portfolio, where the abnormal return increases post-MiFID II, the results for the equally weighted buy portfolio contradict our expectations. We cannot find evidence that confirms our third hypothesis that the abnormal returns of the portfolios will increase post-Mifid II.

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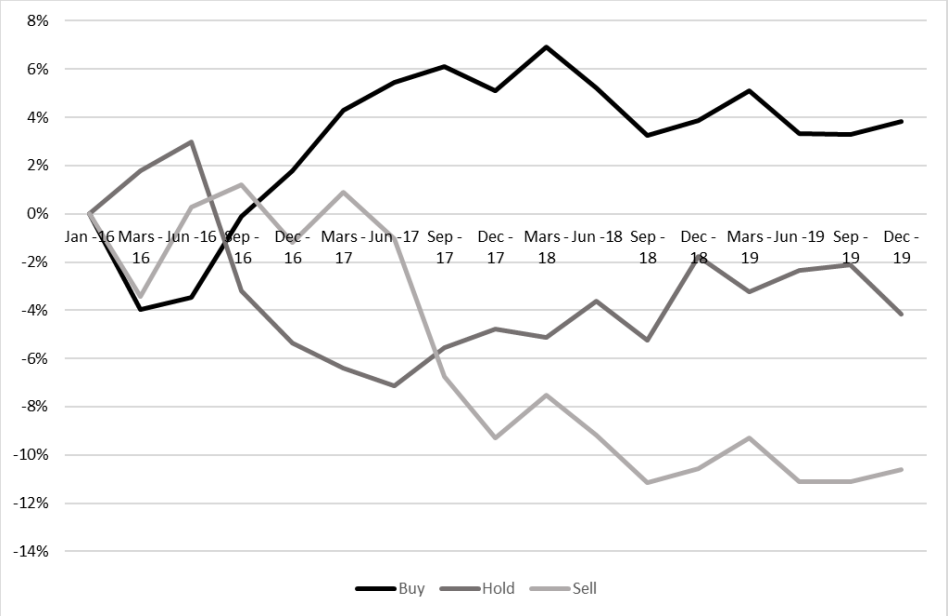
Appendix A: Figure

Figure AI

Cumulative value-weighted market-adjusted returns



Appendix B: Tables

Table AI

Value-weighted annual percentage returns net of transaction costs, average full period (2016-2019)

Full period		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolio	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	15.76	10.93	13.75	−3.88	−1.06
Hold	13.77	7.46	11.14	−7.35	−3.67
Sell	11.62	−3.36	5.38	−18.17	−9.43

Table AII

Equally weighted annual percentage returns net of transaction costs, average full period (2016-2019)

Full period		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolio	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	16.09	11.25	14.07	1.71	4.03
Hold	4.99	−1.33	2.36	−9.09	−6.04
Sell	13.71	−1.27	7.47	−8.04	−0.74

Table AIII

Value-weighted annual percentage returns net of transaction costs, average pre-MiFID II (2016-2017)

Pre-MiFID II		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolio	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	16.99	12.01	14.91	−2.43	0.48
Hold	12.04	5.41	9.28	−9.02	−5.16
Sell	9.78	−6.52	2.99	−20.95	−11.45

Table AIV

Equally weighted annual percentage returns net of transaction costs, average pre-MiFID II (2016-2017)

Pre-MiFID II		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolio	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	18.32	13.34	16.25	−1.70	1.20
Hold	4.85	−1.77	2.09	−16.82	−12.95
Sell	27.62	11.32	20.83	−3.73	5.78

Table AV

value-weighted annual percentage returns net of transaction costs, average post-MiFID II (2018-2019)

Post-MiFID II		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolio	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	14.54	9.85	12.58	−5.34	−2.60
Hold	15.50	9.50	13.00	−5.68	−2.18
Sell	13.46	−0.21	7.76	−15.39	−7.42

Table AVI

Equally weighted annual percentage returns net of transaction costs, average post-MiFID II (2018-2019)

Post-MiFID II		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolio	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	13.85	9.16	11.90	5.12	6.86
Hold	5.12	−0.89	2.62	−1.37	0.86
Sell	−0.20	−13.86	−5.89	−12.35	−7.27

Table AVII

Equally weighted annual percentage returns net of transaction costs, Full period

The Buy-Sell portfolio refers to a spread strategy where you go long on the buy portfolio and short on the sell portfolio.

2016		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolio	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	21.61	16.63	19.54	−1.47	1.44
Hold	11.22	4.59	8.46	−13.50	−9.64
Sell	37.53	21.24	30.74	3.14	12.65
Buy-Sell	−15.92	−35.74	−24.18	−53.83	−42.27
2017					
Buy	15.03	10.05	12.96	−1.94	0.96
Hold	−1.51	−8.13	−4.27	−20.13	−16.26
Sell	17.70	1.40	10.91	−10.59	−1.09
Buy-Sell	−2.66	−22.48	−10.92	−34.47	−22.92
2018					
Buy	−1.63	−6.32	−3.58	3.44	6.18
Hold	−10.58	−16.59	−13.09	−6.83	−3.32
Sell	−23.36	−37.03	−29.06	−27.27	−19.30
Buy-Sell	21.73	1.92	13.48	11.68	23.24
2019					
Buy	29.34	24.65	27.38	6.80	7.55
Hold	20.82	14.82	18.32	4.09	5.05
Sell	22.97	9.30	17.27	2.56	4.76
Buy-Sell	6.37	−13.44	−1.89	−3.71	−0.52

Table AVIII

Value-weighted annual percentage returns net of transaction costs, Full period

The Buy-Sell portfolio refers to a spread strategy where you go long on the buy portfolio and short on the sell portfolio.

2016		Return net of transaction cost		Market adj. return net of transaction cost	
Portfolios	Mean raw return	Private Investors	Institutional investors	Private Investors	Institutional investors
Buy	14.67	9.69	12.59	−3.20	−0.29
Hold	7.54	0.92	4.78	−11.96	−8.10
Sell	11.69	−4.60	4.90	−17.49	−7.98
Buy-Sell	2.97	−16.84	−5.28	−29.73	−18.17
2017					
Buy	19.31	14.33	17.24	−1.65	1.25
Hold	16.53	9.91	13.77	−6.07	−2.21
Sell	7.86	−8.43	1.07	−24.42	−14.91
Buy-Sell	11.45	−8.37	3.19	−24.35	−12.79
2018					
Buy	−1.30	−5.99	−3.25	−5.95	−3.21
Hold	2.97	−3.04	0.46	−3.00	0.50
Sell	−3.75	−17.42	−9.44	−17.38	−9.40
Buy-Sell	2.45	−17.36	−5.80	−17.32	−5.76
2019					
Buy	30.37	25.68	28.42	−4.73	−1.99
Hold	28.04	22.04	25.54	−8.37	−4.87
Sell	30.66	17.00	24.97	−13.41	−5.44
Buy-Sell	−0.29	−20.11	−8.55	−50.52	−38.96

Table AIX

Raw monthly percentage returns for all portfolios and full period

	VW			EW		
	Buy	Hold	Sell	Buy	Hold	Sell
2016-01-31	−4.67	−0.18	−4.03	−5.34	−2.06	20.78
2016-02-29	0.02	0.59	−7.47	−0.29	−3.14	−5.60
2016-03-31	0.18	0.86	7.56	3.33	3.32	7.89
2016-04-30	1.91	2.37	2.84	1.48	2.11	5.87
2016-05-31	3.69	1.92	2.31	2.85	0.24	−0.33
2016-06-30	−3.57	−1.58	0.11	−2.99	−4.10	−1.39
2016-07-31	3.02	2.35	2.57	5.43	4.23	4.24
2016-08-31	4.95	−1.37	1.29	4.40	3.29	−1.02
2016-09-30	1.61	−0.90	3.30	3.16	0.67	0.66
2016-10-31	0.10	−2.62	−0.43	1.17	−0.68	−3.98
2016-11-30	0.68	1.89	−0.37	2.26	1.21	−2.68
2016-12-31	6.74	4.21	4.02	6.14	6.15	13.10
2017-01-31	2.04	0.44	4.04	2.54	3.07	14.81
2017-02-28	3.08	0.68	−1.61	1.94	0.51	−1.39
2017-03-31	2.06	2.49	4.35	0.10	0.92	17.27
2017-04-30	5.04	4.81	5.43	4.14	4.25	5.14
2017-05-31	2.58	2.25	0.72	0.94	−4.67	−2.49
2017-06-30	−0.47	−1.79	−2.09	0.01	−1.46	−2.92
2017-07-31	0.48	0.28	−4.60	0.87	0.55	−4.27
2017-08-31	−0.32	1.46	−2.01	−0.52	−2.46	−3.81
2017-09-30	5.44	4.78	5.80	3.93	2.88	3.96
2017-10-31	1.09	3.44	2.29	1.35	−1.13	−2.13
2017-11-30	−2.51	−2.55	−3.68	−2.03	−5.25	−5.84
2017-12-31	0.80	0.26	−0.78	1.77	1.29	−0.65
2018-01-31	2.23	1.28	1.93	2.59	1.46	0.94
2018-02-28	0.36	−1.03	−5.27	−1.76	−2.39	−4.96
2018-03-31	−1.45	−1.24	−3.25	−2.19	−1.07	−3.30
2018-04-30	5.02	4.69	6.63	4.90	3.50	1.69
2018-05-31	1.27	1.93	−3.90	3.58	0.21	−0.32
2018-06-30	−1.42	1.45	−0.44	−0.17	0.00	−0.60
2018-07-31	3.65	2.21	6.86	3.78	2.89	4.40
2018-08-31	2.72	2.40	−7.34	1.70	2.46	−1.68
2018-09-30	−1.81	0.28	13.70	1.07	−1.04	−0.44

2018-10-31	−7.17	−5.91	−5.39	−7.57	−7.44	−5.79
2018-11-30	0.43	0.91	4.23	−0.50	−2.84	−2.79
2018-12-31	−5.13	−4.00	−11.51	−7.07	−6.33	−10.51
2019-01-31	8.73	5.43	5.65	7.13	6.82	9.87
2019-02-28	5.74	4.53	5.72	4.89	3.09	2.34
2019-03-31	0.84	2.64	4.76	0.85	1.02	−0.10
2019-04-30	4.55	5.06	5.07	5.39	4.69	3.43
2019-05-31	−6.16	−3.59	−8.27	−4.58	−3.71	−3.72
2019-06-30	4.29	3.88	3.17	2.42	2.26	2.70
2019-07-31	0.78	−0.39	0.68	0.51	−0.15	0.50
2019-08-31	−1.64	1.16	2.12	−2.48	−4.31	−1.61
2019-09-30	3.88	2.54	1.05	2.49	4.63	1.69
2019-10-31	2.76	2.49	2.90	2.16	0.66	0.63
2019-11-30	3.01	0.63	3.27	3.80	2.61	3.39
2019-12-31	3.60	3.69	4.53	6.75	3.21	3.87

Table AX

Value-weighted and equally weighted benchmark annual percentage returns, full period

	VW	EW
Year	**Return**	**Return**
2016	12.88	18.10
2017	15.98	12.00
2018	−0.04	−9.76
2019	30.41	27.57