

Momentum in Stock Returns Following Dispersion and Consensus in Analysts' Forecasts

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Abstract

Our study shows that it is possible for an investor to employ profitable zero-cost portfolio strategies on the OMX Stockholm Benchmark Index that exploit momentum following analysts' forecasts. The significant alpha of the monthly rebalanced long-short portfolios suggests that the analysts' forecasts momentum should be exploited within a month. As predicted by earlier literature, we find a negative relationship between dispersion in analysts' forecast and future stocks returns, while a portfolio of low-dispersion stocks not necessarily outperforms. Our results on the liquid and investable OMX Stockholm Benchmark Index support that any market friction, not necessarily short-selling constraints, will produce the negative relation between dispersion in forecasts and future returns.

Key words: momentum, forecast dispersion, analysts' recommendations, short-selling restraints, behavioural finance

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Table of contents

1. Introduction.....	3
2. Literature review	5
3. Data	7
4. Methodology.....	9
5. Results	13
5.1 Robustness	27
5.1.1 Lag in portfolio formation.....	27
5.1.2 Sub-period analysis.....	32
5.1.3 Equal-weighted portfolios.....	36
6. Conclusion.....	39
7. References	41
8. Appendices	43

1. Introduction

We study the existence of momentum following analysts' forecasts on stocks in the OMX Stockholm Benchmark Index (OMXSB) and the practical ability for an investor to exploit these anomalies. The four portfolio strategies are based on dispersion in target price forecasts, dispersion of buy/hold/sell-recommendations, the consensus in buy-recommendations, and a combined factor of the two best performing analysts' forecast factors; the dispersion in target price forecasts and consensus in buy-recommendations.

According to the efficient market theory, attempts to use analysts' forecast to produce above-normal returns are doomed. The mass distribution makes them a public good immediately upon release which leads to a direct adjustment of any arbitrary over- or underpricing. However, empirical studies have shown that it exists an underreaction to public information such as analysts forecast and one can achieve abnormal returns by exploiting the following drift in stock prices (Barber et al. 2001) (Givoly and Lakonishok, 1980).

The profitability of momentum strategies are generally supported, yet the momentum anomalies remain unexplained in the context of the efficient market theory (Fama and French, 1996). Miller (1977) was the first to propose the intuitively appealing theory that when opinions diverge, and short-selling restraints bind, pessimistic investors are hindered from expressing their opinions which lead stock prices to reflect an overly optimistic view. In using dispersion in analysts' forecasts as a proxy for diverging opinions, Diether et al. (2012) find a significant negative relation between high dispersion in analysts' forecasts and future returns. Hong et al. (2000) suggest another widely acknowledged theory that the momentum arises from gradual information flow of analysts' firm-specific information. In using market size and analyst coverage as a proxy for information diffusion, Hong et al. (2000) find that momentum exists for stocks with low market capitalisation and low analyst coverage.

These and many other momentum studies are based on a complete market universe where the practical issues of trading small and illiquid stocks are overlooked (Hong and Stein, 1999) (Diether et al., 2002). Apart from the liquidity issues in the practical implementation of previous studies, another relates to the neglect of realistic rebalancing frequencies. Daily rebalancing is not a common action for investors other than professional day-traders, yet daily rebalancing frequencies is a recurrent theme in the literature body.

The practical implication of momentum strategies are far less covered in academia, and few covers the Swedish market in specific. Therefore, we believe it is interesting to study whether the general results from earlier studies also hold for the Swedish equity market and in

practice by using less frequent rebalancing periods on a more investable sample. The illiquidity is cared for by limiting the universe to stocks traded on the OMXSB. The OMXSB consists of the largest and most traded stocks, representing all ten sectors, and is by nature a liquid and an investable index (Nasdaq, 2018). The sample characteristics also enable us to ensure a high minimum number of analysts covering each stock. In using the liquid OMXSB we test the practical ability for an investor to exploit the momentum in analysts' forecasts on the OMXSB, and the two central theories of short-selling restraints and information diffusion.

To study the existence of momentum following analysts' forecasts, we create four different factors based on analysts' forecasts on target prices and buy/hold/sell-recommendations; Target Price Dispersion, Recommendation Dispersion, Buy-signal Revision, and the Combination factor formed by the Target Price Dispersion and Buy-signal Revision. Stocks in the security universe are ranked based on the factor measure and grouped accordingly into quantiles. We take a long position in the stocks in quantile 1 and a short position in the stocks in quantile 5 for each factor to test whether it is possible for an investor to employ profitable zero-cost portfolio strategies using these factors. We value-weight our portfolios and test the strategies between 31st of March 2005 to 2nd of January 2017, and benchmark to the value-weighted OMXSB and the value-weighted index of all Swedish stocks.

We find that it is possible for an investor to exploit negative momentum anomalies by employing a monthly rebalanced zero-cost portfolio using any of the above factors to select stocks, except for the Recommendation Dispersion factor. A long-short portfolio under monthly rebalancing created using the Target Price Dispersion, Buy-signal Revision or the Combination factor, has generated significant estimated annual excess returns under the Carhart four-factor model of 21.17, 21.67 and 19.66 percent respectively. Meanwhile, a buy-and-hold strategy of the OMXSB and the index of all Swedish stock has generated mean annual returns of 8.65 and 12.72 percent respectively. As the results remain under the Carhart four-factor model, our results are not simply a result of common systematic risk exposures.

Our results align with the theory of Diether et al. (2002) that any market friction, not necessarily short-selling constraints, will produce the negative momentum to analysts' forecasts. Our sample characteristics contradict the possibility that our market friction is derived from information diffusion since the proxies for information diffusion used by Hong et al. (2000) are small stocks and low analyst coverage. In line with previous literature, we find across all factors that the high-dispersion portfolio underperform while the low-dispersion stocks not necessarily outperform (Miller, 1977). The same holds true for the Buy-signal Revision factor.

2. Literature review

In documenting significant alpha on portfolios based on analysts' forecasts on a security universe composed of the liquid and investable OMXSB, we extend two centered papers in the theoretical debate of momentum; Diether et al. (2002), and in turn Miller (1977), theory of market frictions and short-sale constraints, and Hong and Stein (1999) documented relation between information diffusion and a stronger earnings momentum effect. Our methodology can easily be extended to the study of other anomalies, such as corporate events or the post-earnings announcement drift.

Our results are also currently relevant in the light of the EU reform MiFID II effective from January 2018. The equity research sector will be profoundly affected by the regulation as asset managers will need to fund external research. Under MiFID II, competition is likely to increase within equity research as asset managers become more selective. Therefore, understanding whether it is possible for an investor to exploit analysts forecast momentum anomalies is of central importance both for asset managers and for analysts.

Givoly and Lakonishok (1980) were among the first to report a momentum effect following analysts' revisions of their forecasts of corporate earnings. A related effect is price momentum where the notion is that past winners continue to perform well, and past losers continue to perform poorly. An impressive magnitude of one percent abnormal return per month is reported by Jegadeesh and Titman (1993) for a self-financing price momentum strategy. The momentum anomalies have been left unexplained in the context of efficient market theory, where predictable patterns in asset returns should be able to be explained by differences in loadings on economically meaningful risk factors. Fama and French (1996) acknowledge that their three-factor model is unable to explain the momentum effect reported by Jegadeesh and Titman (1993). Nevertheless, we employ both the Fama-French three-factor model and the Carhart four-factor model, which includes a momentum factor built upon the findings by Jegadeesh and Titman (1993), to reject the suggestion that our documented returns are a result of priced risk-factors.

The theoretical debate on the drivers behind the momentum effect centres on the intuitively appealing theory set forth by Miller (1977). Miller (1977) suggests that when opinions diverge, and short-selling constraints exist, prices will reflect a more optimistic valuation since pessimistic investors will not sell the stock. In interpreting dispersion in analysts' forecasts as a proxy for diverging opinions about a stock, Diether et al. (2002) document that stocks with high dispersion yield abnormal negative returns and thus generate a

profitable portfolio strategy of shorting high-dispersion stocks. Diether et al. (2002) extend the short selling-restraints by Miller (1977) by arguing that any market friction, such as the incentive structure of analysts when issuing forecasts, that prevents the revelation of negative opinions will produce this negative relation between dispersion in forecasts and future returns.

Another widely recognised theory is the one by Hong and Stein (1999) that a lower rate of information diffusion among investors leads to a stronger earnings momentum effect. Hong et al. (2000) use market size and analyst coverage as a proxy for information diffusion and find that momentum is more pronounced for stocks with low market capitalisation and low analyst coverage. Their rationale is that if momentum arises from gradual information flow, then the stocks where information diffuses slower should have more momentum.

Along the lines of diverging opinions (Miller, 1977) (Diether et al., 2012), we employ two dispersion measures; the Recommendation Dispersion and the Target Price Dispersion. In employing these two measures on our liquid and investable securities universe, we test the practical implementation of using dispersion in analysts' forecasts in portfolio management and challenge the theory of short-selling restraints as the facilitator for momentum following analysts' forecasts. By basing our sample on the OMXSB we also test the validity of the information diffusion theory, that momentum following analysts' publications of firm-specific information should be trivial for large stocks with high analyst coverage.

The robustness of the momentum effect to different risk-adjustments has motivated explanations from the premise of behavioural finance as an alternative to the likes of Diether et al. (2002) and Hong et al. (2000) that relax the market efficiency assumption of homogenous expectations. Turning to behavioural finance, the momentum anomaly is consistent with several irrationalities that characterise individual decision making. Daniel et al. (Daniel et al. 1998) document a model where overconfidence leads to negative long-lag autocorrelations and where biased self-attribution adds positive short-lag autocorrelations. Investors' overconfidence in their ability to price stocks leads them to underestimate their forecast error variance and their biased self-attribution lead them to underreact to public information that contradicts their private information. Consistently in these behavioural models, momentum is driven from the underreaction of price adjustments following public news, and overreaction following private signals. These empirically documented theories that prices drift in the direction of analysts' forecasts consensus underpin our motivation to test a portfolio strategy of buying stocks with the most buy-revisions and selling stocks with the least buy-revision in relation to all other sample stocks, in search for abnormal returns trailing investor behavioural biases.

3. Data

We obtain daily return data from the Bloomberg terminal using the Backtesting tool to create the portfolios based on the securities universe on the OMX Stockholm Benchmark Index (OMXSB) and the four different analysts' forecasts factors; Target Price Dispersion, Recommendation Dispersion, Buy-signal Revision and Combination factor. The returns are value-weighted, and we rebalance each portfolio over four different holding periods; one month, three months, six months and twelve months; respectively. Thus, for the one month holding period the rebalancing frequency is monthly. We also gather the value-weighted daily returns from Investing.com on the full OMXSB to benchmark against our portfolio returns. Since the OMXSB is value-weighted by praxis, we can better capture the economic significance of the performance of our portfolios by value-weighting the stocks in the portfolios and then compare the returns to the benchmark. Also, the more heavily representation of small firms in equal-weighted portfolios could overstate the portfolio returns.

The sample period ranges from 31st of March 2005 to 2nd of January of 2017 and includes 2947 days of trading. The sample period we cover is thereby more recent than the data used in a majority of earlier studies. We limit the sample period to 2nd of January 2017 because the three Fama-French factors, the momentum variable, data on the risk-free rate and the market return on all Swedish stocks are gathered from Swedish House of Finance's database, aggregated daily, from 31st of March 2005 up to 2nd of January 2017.

Our securities universe is based on the OMXSB which consists of a selection of the largest and most traded Swedish stocks. Our motivation to use the OMXSB is that it is designed to ensure an investable and liquid index. The constituents of the OMXSB are screened to ensure liquidity and selected on the basis of the free float-adjusted market value, which ensures that only the part of the share capital that is considered available for trading is included (Nasdaq, 2018). Moreover, twice a year the OMXSB is revised to ensure that it offers high investability and low transaction costs. Note that the investable universe for the portfolios at each rebalancing date consists of the effective OMXSB constituents at that particular point in time.

The large stocks and low transaction costs that characterise the OMXSB may bias our results against finding evidence of abnormal returns since markets are likely to be most efficient for the largest securities (Hong et al. 2002). Hong et al. (2000) prove that the momentum effect is larger for smaller stock and argue that this is because information diffusion is likely to be largest for these stocks. Along with this reasoning, Diether et al. (2002) claim in line with Miller (1977) that smaller stocks are likely to create larger momentum since they are

the hardest to short and least likely to have traded options. However, as our objective is to empirically document a practicable momentum investment strategy, our standpoint is that the bias of our sample is more of an addition than a limitation of our paper. The large stocks and investable characteristics ensure less shorting restraints compared to highly illiquid small stocks.

The stocks that constitute our security universe are included based on the fulfilment of three criteria; trading status is active at portfolio rebalancing date, it is the primary security of a company, and the stock is covered by more than six analysts at portfolio rebalancing date. Any stock in the universe that fails to fulfil on one or more of the criteria during the period is dropped from the sample and included once regained status. If a stock is included in a portfolio and fails to fulfil a criterion over the holding period, it will maintain in the portfolio up until the end of the holding period. Our requirement of more than six analysts caps our momentum effect as a function of information diffusion from analyst coverage, thereby isolating the effect from the specific revision and dispersion factor. As shown in Table 1, typically, 14 analysts covered a single stock over our sample period. Hong et al. (2000) use analyst coverage as a proxy for information diffusion and find that a majority of the low coverage stocks carry negative momentum. Their sample consists of as few as zero analysts for a majority of their sample period and for their strategy the median analyst coverage of the low-coverage portfolio is 0.1 and only 7.6 for their high-coverage. In using a higher analyst coverage we implicitly test the validity of the information diffusion theory.

Table 1.

Summary Statistics of Sample Size, Analysts and Cost: March 2005 to January 2017

Table 1 present descriptive statistics for all stocks in our security universe during the period from 31st of March 2005 to 2st of January 2017. Panel A reports summarised descriptive statistics about the securities in the universe as of 31st of March every year during our sample period. Panel B reports average transaction cost for security universe by quantiles based on the analyst coverage. Panel C reports average transaction cost for our security universe by quantiles based on market cap.

Panel A:	Average amount		Market Cap (SEKbn)			Average Market Cap (SEKbn)		
Sub-period	Stocks	Analysts/stock	Average	Max	Min	P100	P66	P33
2005-2009	38	14	71	356	8	155	40	15
2009-2013	50	15	60	352	2	139	159	178
2013-2017	51	14	86	456	7	198	202	205

Panel B: Average Transaction Cost by Analyst Coverage					
	Quantile 1	Quantile 2	Quantile 3	Quantile 4	Quantile 5
Mean transaction cost	0.035%	0.059%	0.059%	0.069%	0.065%

Panel C: Average Transaction Cost by Market Cap					
	Quantile 1	Quantile 2	Quantile 3	Quantile 4	Quantile 5
Mean transaction cost	0.028%	0.05%	0.059%	0.064%	0.069%

4. Methodology

We assign stocks into quantiles based on the ranking of the stocks according to each factor at the rebalance date. Stocks above the 80th percentile are grouped into quantile 1, and the stocks in the 20th percentile are grouped into quantile 5. The strategy is to take a long position on the stocks in quantile 1 and a short position in the stocks in quantile 5 for each factor. For each portfolio, we report estimated excess returns after adjusting for four common risk factors for monthly, quarterly, semi-annual and annual rebalancing.

The four different factors created to test the practical possibility to exploit momentum following analysts' forecasts are based on either analysts' estimated target prices or analysts' buy/hold/sell-recommendations. These measures are natural choices as they arguably are the easiest accessible estimates online by investors; it is delivered by several financial information providers such as Bloomberg and incorporates the opinion and information of several analysts. We use two different factors on dispersion in analysts' estimates to test the practical implementation of using dispersion in analysts' forecast in portfolio management on a Swedish sample. The first is the dispersion in analysts' estimated target prices and the second is the dispersion in analysts' buy/hold/sell-recommendations. As we base our sample on the investable OMXSB, we also test the validity of the theories of short-selling restraints and information diffusion on the Swedish market. The Buy-signal Revision factor is created to test the how the change in the level of consensus and future stock returns are connected. Initial testing showed that the Buy-signal Revision factor and the Target Price Dispersion factor performed the best, which motivated us to combine the two factors into the Combined factor.

We create all revision and dispersion factors using the Bloomberg database, the Bloomberg Equity Screening tool (EQS) and the Bloomberg Backtesting tool applied on our security universe. Any estimate older than three months at the rebalance date is dropped from the sample.

We create the Target Price Dispersion factor by taking the difference between the highest and the lowest of the analysts' target prices in SEK at each rebalance date, divided by the lowest price target, for each stock. Thereafter, the stocks in our security universe are ranked where the stock with the smallest spread (lowest dispersion) is in the 100th percentile. Thus, the stocks with the lowest Target Price Dispersion measure are in quantile 1, and the stocks with the highest Target Price Dispersion measure are in quantile 5.

The Recommendation Dispersion factor is built upon the total number of sell-, hold- and buy-recommendations respectively for each stock in the universe. We create the factor by

computing the standard deviation in analysts' sell-, hold- and buy-recommendations for each stock at each rebalance date. Thereafter, the stocks in our security universe are ranked where the stock with the lowest standard deviation (lowest dispersion) is in the 100th percentile. Thus, the stocks with the lowest Recommendation Dispersion measure are in quantile 1, and the stocks with the highest Recommendation Dispersion measure are in quantile 5.

We build the Buy-signal Revision factor by taking the ratio between the number of buy-recommendations to the number of total buy/hold/sell-recommendations for each stock at the rebalancing date, divided by the same ratio one month back. Thereafter, the stocks in our security universe are ranked where the stock with the highest revision is in the 100th percentile. Thus, the stocks with the highest Buy-signal Revision measure are in quantile 1, and the stocks with the lowest Buy-signal Revision measure are in quantile 5.

Lastly, we create a combined factor of the Buy-signal Revision factor and the Target Price Dispersion factor called the Combination factor. We first rank the stocks from our universe on each factor separately, and thereafter rank the stocks into quantiles using their combined ranking of the two factors. Thus, the stocks with the highest Buy-signal Revision measure and the lowest Target Price Dispersion measure are grouped into quantile 1, and the stocks with the lowest Buy-signal Revision measure and the highest Target Price Dispersion measure are grouped into quantile 5. The high-revision-low-dispersion portfolio (quantile 1) will be called HRLD, and the low-revision-high-dispersion portfolio (quantile 5) will be called LRHD.

To determine whether profitable investment strategies exists involving analysts' forecasts revision and the two dispersion measures, we initially couch quantile 1, quantile 5 and the long-short portfolio in terms of their mean value-weighted raw returns, standard deviation and determine their Sharpe ratios. Throughout, annualised returns are calculated by multiplying the daily returns by 252, as this is the average number of trading days on the Swedish stock market. The performance of the factor portfolios are compared to two benchmarks; the OMX Stockholm Benchmark Index and the index consisting of all Swedish stocks, provided by the Swedish House of Finance. We use both as benchmarks because our security universe is based on the OMXSB whereas the four risk factors used in our time-series regressions on the portfolio returns are based on all Swedish stocks.

Thereafter, we employ three different time-series regressions for risk adjustments for both the quantile portfolios and the long-short strategy and employ t-tests for individual significance across each holding period for all explanatory variables and intercept. Firstly, we

employ the Capital Asset Pricing Model (CAPM) and estimate the following time-series regression across each holding period to yield parameter estimates of alpha and beta:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + \varepsilon_{pt}$$

Where

R_{pt} = The daily return of portfolio p, at day t

R_{ft} = The daily Swedish risk-free rate, consisting of the monthly Swedish T-bill, at day t

R_{mt} = The daily market return of all Swedish stocks, at day t

α_p = The estimated daily alpha (intercept) for portfolio p

β_p = The estimated market beta for portfolio p

ε_{pt} = The error term, at day t

In line with Fama and French's findings (1996), we employ the three-factor model by Fama and French (1993) to explore the possibility that the CAPM average-return anomalies are reflecting pricing of systematic risk exposures. We estimate the following time-series regression for both the two quantile portfolios and the long-short portfolio for each of the four factors for all holding periods respectively:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + \delta_p * SMB + h_p * HML + \varepsilon_{pt}$$

The coefficients β_p , δ_p , and h_p , are factor loadings, also called sensitivities, on the risk premium factors. The HML variable (High-Minus-Low) is the value-weighted return premium equal to the average return on Swedish high book-to-market stocks ("value stocks") minus the average return on Swedish low book-to-market stocks ("growth stocks"). The SMB variable (Small-Minus-Big) is the value-weighted return premium equal to the average return on Swedish small-cap stocks minus the average return on Swedish large-cap stocks. Our principal testable implication for this Fama-French three-factor model is that α_p (the portfolio alpha) is equal to zero for all portfolio strategies.

Along the Fama-French risk factor rationale (1996), we add a momentum factor to capture the medium-term continuation of returns from past winners and losers stocks which is found to be an additional source of priced systematic risk (Jegadeesh and Titman, 1993) (Carhart, 1997).

$$R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + \delta_p * SMB + h_p * HML + k_p * MOM + \varepsilon_{pt}$$

In this Carhart four-factor model, the MOM variable represents the value-weighted return premium equal to the return on Swedish past winner stocks minus the return on Swedish past loser stocks, and k_p is the loading factor.

To explore the robustness of our results, we employ three different robustness checks. Firstly, we test for a lag in portfolio formation by using three, six and twelve months revision periods in the Buy-signal Revision factor and the Combination factor. The results are risk-adjusted under the CAPM, Fama-French three-factor model and the Carhart four-factor model. The rationale behind this robustness check is that our returns could be a result of different information available in analysts' forecasts at different points in time.

Secondly, we employ a sub-period analysis where we calculate risk-adjusted returns using the CAPM and Carhart four-factor model across all factors over the time periods; March 2005 to February 2009, March 2009 to January 2013, and February 2013 to January 2017. The sub-periods consist of 984 days, 989 days and 974 days respectively. It is interesting to analyse the performance of the factor portfolios over different sub-periods considering that the sample period covers the Financial Crisis.

Lastly, we employ all four factors with equal-weighted portfolio returns. Most studies document substantial momentum anomalies from this return weighting and, consistent with the practicability goal of our study, we recognise the possibility for an investor to use equal-weighted portfolios. The SMB, HLM and MOM factors are equal-weighted when controlling for other risk factors in the CAPM, Fama-French's three-factor model and Carhart four-factor model.

5. Results

Target Price Dispersion

As evident from Table 2, the yearly mean raw returns are very high for the portfolio of low-dispersion stocks (quantile 1) across the four different holding periods compared to the benchmarks. However, the portfolios are much riskier compared to the OMXSB benchmark and the benchmark consisting of all Swedish stocks, confirmed by high standard deviations, negative skewness, high kurtosis and large negative returns in the 1st percentile. Although the portfolios of low-dispersion stocks are riskier than the benchmarks, the Sharpe ratios indicate that holders of the low dispersion portfolio are better compensated for the risk compared to holders of any of the two benchmarks.

The average daily returns across different holding periods of the high-dispersion portfolio (quantile 5) are substantially lower than the corresponding holding periods of the low-dispersion portfolio. However, the high-dispersion portfolio still outperforms the OMXSB benchmark for the monthly, quarterly and semi-annual rebalancing periods. Similar to the low-dispersion portfolios, the portfolios of high-dispersion stocks is much riskier than the two benchmarks, which in combination with the low Sharpe ratios suggest that investors should avoid buying the stocks in the high-dispersion portfolio. The low mean returns for the high-dispersion portfolio and the lower mean returns for longer holding periods are in line with previous literature which documents that high-dispersion stocks have a negative association with future stock returns (Diether et al., 2002) (Johnson, 2004)

The average return of the long-short portfolios is lower than the average returns of the long leg when compared across the corresponding holding periods. Nevertheless, except for quarterly rebalancing of the long-short portfolio, the Sharpe ratio of the long-short portfolios are better than the Sharpe ratio of the two benchmarks and the long leg. The results indicate that the long-short strategy is providing better risk compensation compared to the OMXSB and the benchmark consisting of all Swedish stocks and the long and short leg individually.

Table 2.

Mean Portfolio Returns for Target Price Dispersion Factor

Table 2 presents descriptive statistics of the mean portfolio returns for the Target Price Dispersion factor and the two benchmarks during the period 31st of March 2005 to 2st of January 2017. The Target Price Dispersion factor is created by taking the difference between the highest and the lowest of the analysts' target prices in SEK at each rebalance date, divided by the lowest price target, for each stock. Thereafter, the stocks in our security universe are ranked where the stocks with the smallest spread (lowest dispersion) is in quantile 1 and the stocks with the highest Target Price Dispersion is in quantile 5. Presented are the daily mean returns, standard deviation, skewness, kurtosis and the 1st and 99th percentile of daily returns, and the yearly mean returns and Sharpe ratios for quantile 1 (low-dispersion), quantile 5 (high-dispersion) and the long-short portfolio over different holding periods.

Portfolio	Rebalancing	Daily						Yearly	
		Mean Return	SD	P1	P99	Skewness	Kurtosis	Mean Return	Sharpe Ratio
Quantile 1	Monthly	0.143%	3.377%	-9.642%	10.073%	-0.583	11.944	36.029%	0.654
	Quarterly	0.105%	2.540%	-7.194%	7.518%	-0.390	9.776	26.413%	0.631
	Semi-annually	0.116%	2.667%	-7.946%	8.055%	-0.448	10.649	29.264%	0.668
	Annually	0.139%	3.235%	-9.542%	9.854%	-0.441	9.976	34.918%	0.661
Quantile 5	Monthly	0.037%	2.300%	-6.391%	5.886%	-0.453	6.700	9.412%	0.231
	Quarterly	0.076%	3.049%	-8.502%	8.111%	-0.519	8.055	19.072%	0.374
	Semi-annually	0.038%	2.333%	-6.035%	5.890%	-0.484	7.001	9.671%	0.235
	Annually	0.029%	2.167%	-5.834%	5.563%	-0.528	6.787	7.324%	0.184
Long-short	Monthly	0.106%	2.180%	-5.783%	6.681%	-0.066	10.768	26.617%	0.741
	Quarterly	0.029%	1.919%	-5.061%	5.351%	0.382	7.752	7.341%	0.209
	Semi-annually	0.078%	1.745%	-4.578%	5.249%	0.493	8.577	19.594%	0.672
	Annually	0.110%	2.114%	-6.187%	7.141%	0.104	8.885	27.594%	0.793
Benchmark	OMXSB	0.034%	1.411%	-4.044%	3.870%	0.044	7.896	8.652%	0.343
	All Swedish stocks	0.050%	1.356%	-3.948%	3.670%	-0.004	8.014	12.720%	0.545

Figures 1.a-e in appendix graph the total percentage return for all rebalancing frequencies of quantile 1, quantile 5 and the long-short portfolio over the entire sample period. Evident from the graphs, there is a large time discrepancy considering the performance of both quantiles compared to the benchmark over the sample period. During the earlier years, about 2005-2012, both quantile 1 and quantile 5 followed the benchmark unerringly for all rebalancing periods. After 2012, the returns of quantile 1 skyrocketed across all rebalancing periods while the quantile 5 continued to follow the benchmark for monthly, semi-annual and annual rebalancing. This indicates that the high mean returns for quantile 1 shown in Table 2 are mainly driven by the remarkable performance of the stocks over the most recent years of the sample period, during which also the benchmarks grew substantially. The discrepancy of the performance of the portfolios over time also holds true for the long-short strategy. Figure 1.e shows that monthly, semi-annual and annual rebalancing of the long-short portfolio have generated higher returns compared to the benchmarks in the past years. The performance and related time periods will be analysed more closely in the robustness check of the different sub-periods.

Table 3 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. When estimating the daily excess returns under the CAPM, we find one significant negative intercept for the high-dispersion portfolio for a holding period of twelve months. Across all other holding periods, we do not find any significant alpha neither for the portfolio consisting of the low-dispersion stocks nor the portfolio of high-dispersion stocks (quantile 5). The same results emerge when we estimate the Fama-French three-factor model time-series regressions over the portfolios' daily returns and the negative intercept of the high-dispersion portfolio over a holding period of twelve months remain significant. When we augment the three-factor model by the momentum variable, the significance of the high-dispersion intercept for annual rebalancing remain, and the intercept becomes even more negative. This finding further supports the theory that high-dispersion stocks will underperform (Diether et al., 2002) (Johnson, 2004) (Miller, 1977).

The portfolio factor loadings are close to identical across both the three- and four-factor models. The high-dispersion portfolios are tilted towards big stocks with low book-to-market ratios, whereas the SML and HML variables for the low-dispersion portfolio lack significance for virtually all holding periods. The loadings on the momentum factor are significant for both quantiles and express a clear pattern where the high-dispersion stocks behave like stocks that have performed poorly on average and the low dispersion stocks behave like stocks that have performed well on average. Both the high- and low-dispersion portfolios have significant and remarkable high beta for the market risk premium across all holding periods. The very high betas on the market risk premium and the insignificant intercepts of the low-dispersion stocks suggest that the high mean returns of quantile 1 presented in Table 2 is not abnormal but just compensation for exposure to market risk. The market risk beta for the significant annually rebalanced high-dispersion portfolio is close to 1.4 in the three-factor model, which indicates that the portfolio has above average market risk. When adding the momentum factor, the market risk premium lowers slightly for all holding periods of the high dispersion portfolios due to increased loading on the momentum factor.

The estimated significant intercepts of the long-short portfolio under the three-factor model suggest positive excess returns for monthly, semi-annually or annually rebalancing. The four-factor time-series regression leaves even larger unexplained significant yearly returns of 21.17, 19.66 and 22.42 percent when rebalancing the portfolio monthly, semi-annually or annually respectively. These returns outperform the buy-and-hold strategy of the benchmark with all Swedish stocks which on average has yielded annual returns of 12.72 percent (Table

2). As expected from a zero-cost portfolio strategy, the market risk premium loadings are well below one. As anticipated from the significant loadings of the short leg, the long-short portfolio's stocks behave as small value stocks that have performed well on average.

Recommendation Dispersion

Table 4 shows that the average return for the portfolio of low dispersion stocks (quantile 1) is similar to the benchmarks for monthly and quarterly rebalancing, and that the average return increases drastically with longer holding periods of six and twelve months. Also, the risk seems to increase with longer holding periods; the semi-annual and annual rebalancing of the low-dispersion stocks have larger standard deviations in returns, negative kurtosis and higher kurtosis. Nevertheless, the Sharpe ratio is about twice as high for the two longer holding periods compared to the Sharpe ratio of the OMXSB and higher than the Sharpe ratio of the benchmark consisting of all Swedish stocks, which indicates that investors are not uncompensated for the additional risk they take on.

Similar to the low-dispersion stocks, the monthly and quarterly holding periods of the high-dispersion portfolio (quantile 5) have much lower mean returns compared to longer holding periods. This indicates that high-dispersion stocks perform poorly on average in the short-run but outperform the benchmarks after six months, which in turn suggests that the negative momentum returns from high-dispersion stocks are most marked in shorter time periods.

Because of this mismatch in mean returns across different holding periods between the low- and high-dispersion stocks, the long-short portfolio is not performing very well as indicated by the low Sharpe ratios. Nevertheless, the Sharpe ratio for the semi-annual rebalancing of the long-short portfolio is higher than the Sharpe ratio of the OMXSB. However, compared to the Sharpe ratio of the benchmark consisting of all Swedish stocks, the Sharpe ratio for the semi-annual rebalancing of the long-short portfolio is lower.

Table 4.

Mean Portfolio Returns for Recommendation Dispersion Factor

Table 4 presents descriptive statistics of the mean portfolio returns for Recommendation Dispersion factor and the two benchmarks during the period 31st of March 2005 to 2st of January 2017. The Recommendation Dispersion factor is created by computing the standard deviation in analysts' sell-, hold- and buy-recommendations for each stock at each rebalance date. Thereafter, the stocks in our security universe are ranked where the stocks with the lowest standard deviation (lowest dispersion) is in quantile 1 and the stocks with the highest standard deviation is in quantile 5. Presented are the daily mean returns, standard deviation, skewness, kurtosis and the 1st and 99th percentile of daily returns, and the yearly mean returns and Sharpe ratios for quantile 1 (low-dispersion), quantile 5 (high-dispersion) and the long-short portfolio over different holding periods.

Portfolio	Rebalancing	Daily						Yearly	
		Mean Return	SD	P1	P99	Skewness	Kurtosis	Mean Return	Sharpe Ratio
Quantile 1	Monthly	0.054%	2.326%	-6.918%	6.362%	-0.472	6.669	13.598%	0.342
	Quarterly	0.041%	2.065%	-6.058%	5.448%	-0.544	7.823	10.343%	0.286
	Semi-annually	0.110%	2.987%	-8.535%	8.060%	-0.633	11.185	27.821%	0.566
	Annually	0.109%	2.901%	-8.471%	7.813%	-0.614	10.752	27.446%	0.575
Quantile 5	Monthly	0.027%	2.121%	-5.833%	5.570%	-0.211	6.753	6.879%	0.175
	Quarterly	0.019%	1.874%	-5.131%	5.150%	-0.100	6.323	4.838%	0.130
	Semi-annually	0.041%	2.340%	-6.609%	6.511%	-0.059	6.870	10.210%	0.248
	Annually	0.065%	2.876%	-8.150%	7.783%	-0.242	5.860	16.321%	0.336
Long-short	Monthly	0.027%	1.569%	-4.355%	4.099%	-0.499	8.077	6.720%	0.231
	Quarterly	0.022%	1.397%	-3.764%	3.601%	-0.770	10.334	5.504%	0.204
	Semi-annually	0.070%	1.982%	-5.689%	5.682%	-0.785	11.789	17.611%	0.529
	Annually	0.044%	1.930%	-5.448%	5.333%	-0.229	7.596	11.125%	0.331
Benchmark	OMXSB	0.034%	1.411%	-4.044%	3.870%	0.044	7.896	8.652%	0.343
	All Swedish stocks	0.050%	1.356%	-3.948%	3.670%	-0.004	8.014	12.720%	0.545

Figures 2.a-e in appendix graph the total percentage return for all rebalancing frequencies of quantile 1, quantile 5 and the long-short portfolio over the whole sample period. Just as for the Target Price Dispersion factor, there is a time discrepancy for both quantiles' portfolio returns. The high mean returns documented in Table 4 for the semi-annual and annual rebalancing of quantile 1, and the low returns for monthly and quarterly rebalancing of quantile 5, are mainly driven by the performance of the portfolios in the years after 2010. Up until 2010, the portfolios are largely following the benchmarks.

Table 5 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. While the intercepts are insignificant for all holding periods of the low-dispersion portfolio (quantile 1) under the CAPM, the intercept of the monthly and quarterly rebalancing of the high-dispersion portfolio (quantile 5) is significant. Indicated by the insignificant intercepts under the CAPM, the significant loading on the market risk factor is enough to explain the high mean returns with semi-annual and annual holding periods of the low-dispersion stocks presented in Table 4. The asymmetry in

returns between low- and high-dispersion stocks is, as for the Target Price Dispersion results, consistent with Miller's (1977) documentation that high-dispersion stocks will underperform and that low-dispersion stocks will not necessary outperform.

When estimating the three- and four-factor model, the intercept of holding high-dispersion stocks over one and three months remains significant. As expected, the intercepts become somewhat less negative when turning from the three-factor model to the four-factor model. The high-dispersion stocks load significant and negatively on the HML variable across all holding periods, again suggesting that high-dispersion stocks behave as growth stocks. Both the low- and high-dispersion portfolios load on the market risk premium with significant and large coefficients above 1, suggesting that stocks in both the high- and low-dispersion quantiles have higher than average market risk.

The intercepts of the long-short strategy are insignificant under the CAPM and remain so also after adjusting for Fama-French risk factors and the momentum factor. The SMB coefficient is positive and significant for all holding periods except for semi-annual rebalancing, and the positive loading on the HML variable is significant for all holding periods. The resulting market risk premium of the long-short strategy is very small and not consistently significant. Since the long-short alphas are insignificant for all holding periods, we recognise that the long-short strategy diversifies the market risk of the two separate portfolios and that the returns are attributable to common risk premiums where the existing value premium originates from the shorting of high dispersion stocks.

Buy-signal Revision

Note that quantile 5 consists of the stocks with the lowest buy signal revision, compared to consisting of the highest dispersion stocks in the Target Price Dispersion and the Recommendation Dispersion factors described above.

Table 6 shows that more frequent rebalancing of the portfolio of high-revision stocks (quantile 1) have generated very high mean returns compared to the two benchmarks. The mean returns of the portfolio of high-revision stocks decrease with the two longest holding periods, which suggest that the effect of the Buy-signal Revision factor is strongest for shorter time periods. The Sharpe ratios indicate that holders of the monthly or quarterly rebalanced high-revision portfolio are better compensated for the risk compared to holders of the OMXSB benchmarks, whereas holders of the semi-annual or annually rebalanced portfolios are compensated for risk in line with the OMXSB benchmark. Compared to the Sharpe ratio of the

benchmark consisting of all Swedish stocks, only monthly rebalancing of the high-revision portfolio has a slightly better Sharpe ratio.

All rebalancing periods of the portfolio of low-revision stocks (quantile 5) have generated meagre average returns. As the mean returns of the portfolio of low-revision stocks increase with longer holding periods, it is again indicative that the effect of the Buy-signal Revision factor is strongest for shorter time periods.

As expected from the statistics of the long and short leg, the long-short portfolio has high average returns and high Sharpe ratios with monthly or quarterly rebalancing compared to both benchmarks. Similarly, it comes as no surprise that the longer rebalancing periods have much lower returns and Sharpe ratios than both benchmarks.

Table 6.
Mean Portfolio Returns for Buy-signal Revision Factor

Table 6 presents descriptive statistics of the mean portfolio returns for Buy-signal Revision factor and the two benchmarks during the period 31st of March 2005 to 2nd of January 2017. The Buy-signal Revision factor is created by taking the ratio between the number total buy-recommendations to the number of total buy/hold/sell-recommendations for each stock at the rebalancing date, divided by the same ratio one month back. Thereafter, the stocks in our security universe are ranked where the stocks with the highest Buy-signal Revision is in quantile 1 and the stocks with the lowest Buy-signal Revision is in quantile 5. Presented are the daily mean returns, standard deviation, skewness, kurtosis and the 1st and 99th percentile of daily returns, and the yearly mean returns and Sharpe ratios for quantile 1 (high-revision), quantile 5 (low-revision) and the long-short portfolio over different holding periods.

Portfolio	Rebalancing	Daily						Yearly	
		Mean Return	SD	P1	P99	Skewness	Kurtosis	Mean Return	Sharpe Ratio
Quantile 1	Monthly	0.142%	3.488%	-9.427%	9.345%	-0.490	11.780	35.698%	0.627
	Quarterly	0.119%	3.317%	-9.024%	9.617%	-0.262	8.992	30.007%	0.551
	Semi-annually	0.058%	2.600%	-7.341%	7.199%	-0.245	6.225	14.530%	0.328
	Annually	0.069%	2.825%	-7.869%	7.481%	-0.291	6.269	17.347%	0.365
Quantile 5	Monthly	0.010%	1.652%	-4.591%	4.266%	-0.380	7.357	2.569%	0.061
	Quarterly	0.028%	1.853%	-5.210%	4.923%	-0.440	7.759	7.037%	0.206
	Semi-annually	0.032%	1.760%	-4.895%	4.810%	-0.395	8.189	8.011%	0.252
	Annually	0.037%	2.087%	-6.250%	5.695%	-0.292	7.478	9.330%	0.252
Long-short	Monthly	0.131%	2.596%	-7.158%	7.560%	-0.261	14.540	33.129%	0.780
	Quarterly	0.091%	2.356%	-6.223%	6.583%	0.142	10.519	22.971%	0.588
	Semi-annually	0.026%	1.721%	-4.852%	4.545%	0.254	8.072	6.519%	0.203
	Annually	0.032%	1.791%	-4.722%	4.692%	0.094	6.433	8.017%	0.248
Benchmark	OMXSB	0.034%	1.411%	-4.044%	3.870%	0.044	7.896	8.652%	0.343
	All Swedish stocks	0.050%	1.356%	-3.948%	3.670%	-0.004	8.014	12.720%	0.545

Figures 3.a-e in appendix graph the total percentage return for all rebalancing frequencies for quantile 1, quantile 5 and the long-short portfolio over the whole sample period. Similar to the two dispersion factors, the high mean returns of quantile 1 with monthly and quarterly rebalancing proves to be mainly driven by the strong performance of the stocks after

2010. Also, both the low- and high-revision portfolios across all rebalancing periods are following the benchmark in the sample period before 2010. This discrepancy in the performance of the portfolios over time is also true for the long-short strategy. Specifically, the high mean returns generated by the monthly or quarterly rebalancing of the long-short portfolio documented in Table 6 seem to be a result of the strong performance of the portfolios compared to the benchmarks over the last years of the sample period (Figure 3.e).

Table 7 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. The estimated daily excess returns achieved with the monthly rebalancing of the low-revision portfolio is highly significant, confirmed by the high t-value associated with the negative intercept. None of the intercepts for the other holding periods of the low-revision portfolio or the high-revision portfolio is significant. This indicates that the analysts' forecasts momentum for low-revision stocks is rather short-lived and should be exploited within a month.

Even when employing the Fama-French three-factor time-series regressions and the three-factor model augmented with the momentum factor, a large negative daily return is left unexplained for the one-month rebalancing of the low-revision portfolio. In particular, the annual unexplained return is -11.34 percent. This result is consistent with the behavioural theories of Daniel et al. (1998) and Barberis et al. (1998) which both suggests that momentum is driven from the underreaction of price adjustments following public news. The resulting negative returns from the low-revision stocks could be a result of investors being too conservative in updating their beliefs, or that overconfident investors have a biased self-attribution that leads them to underreact to analysts' recommendations that contradicts their personal convictions.

The market risk premium coefficients on both quantile 1 and quantile 5 are consistently above 1 and positive, suggesting that the stocks in both portfolios have high average market risk. On the back of the insignificant intercepts of the high-revision portfolios, the heavy loading on the market risk factor seems to be the reason behind the high mean returns of the high-revision portfolios presented in Table 6. This is not so surprising considering the correlation with the market up until 2010 and the strong growth over the past years, which is the same time as the market expanded. Interestingly, neither the low- nor high-revision portfolios load on any of the four risk factors other than the market risk premium in the four-factor model.

The estimated daily excess returns of the long-short strategy are also statistically and economically significant only for a rebalancing period of one month. In particular, the long-short portfolio with monthly rebalancing has generated a yearly alpha of 21.92 percent under the CAPM. Under the Fama-French three-factor model and Carhart four-factor model, the returns decreased only minimally. The R-squared value is on the low side, only at 0.25 for the four-factor model. Since the long-short portfolio loads on no other risk factor than the market risk premium, the low R-squared suggests that even though the return cannot be explained by commonly used risk factors, it is likely that it exists other drivers of the return. As suggested, these drivers might stem from irrationalities in individual decision making.

Combination

Table 8 presents rather consistent mean returns and Sharpe ratios across all holding periods of the high-revision-low-dispersion portfolio (HRLD, quantile 1). This indicates that annual rebalancing is the best strategy for the HRLD portfolio as less frequent rebalancing will lower the total transaction costs and thereby increase the final profit of the investment.

Monthly rebalancing of the portfolio with low-revision-high-dispersion stocks (LRHD, quantile 5) has generated very low average returns. The returns of the LRHD portfolio increases sharply with longer holding periods, indicating that the portfolio performs poorly in the short run but above the average buy-and-hold strategy for the OMXSB for rebalancing periods of three months or longer.

The long-short portfolio performs best with monthly rebalancing, indicated by both high mean returns and a Sharpe ratio more than twice as high as the Sharpe ratio of the OMXSB and considerably higher than the Sharpe ratio of the benchmark consisting of all Swedish stocks. However, longer holding periods of the long-short strategy is performing the same or worse than the benchmarks, indicated by both the mean returns and Sharpe ratios.

Table 8.

Mean Portfolio Returns for Combination Factor

Table 8 presents descriptive statistics of the mean portfolio returns for Combination factor and the two benchmarks during the period 31st of March 2005 to 2nd of January 2017. The Combination factor is created using the Buy-signal Revision factor and the Target Price Dispersion factor. The stocks are ranked separately on each factor, and thereafter assigned to quantiles based on their ranking of the two factors combined. Thus, the stocks with the highest Buy-signal Revision measure and the lowest Target Price Dispersion measure are in quantile 1, and the stocks with the lowest Buy-signal Revision and the highest Target Price Dispersion are in quantile 5. The high-revision-low-dispersion portfolio (quantile 1) is called HRLD and the low-revision-high-dispersion portfolio (quantile 5) is called LRHD. Presented are the daily mean returns, standard deviation, skewness, kurtosis and the 1st and 99th percentile of daily returns, and the yearly mean returns and Sharpe ratios for quantile 1 (HRLD), quantile 5 (LRHD) and the long-short portfolio over different holding periods.

Portfolio	Rebalancing	Daily						Yearly	
		Mean Return	SD	P1	P99	Skewness	Kurtosis	Mean Return	Sharpe Ratio
Quantile 1	Monthly	0.103%	2.828%	-7.393%	8.027%	-0.364	10.587	26.047%	0.558
	Quarterly	0.081%	2.544%	-6.823%	7.306%	-0.324	10.500	20.488%	0.483
	Semi-annually	0.081%	2.466%	-6.739%	7.074%	-0.353	9.875	20.331%	0.494
	Annually	0.102%	2.620%	-7.258%	7.934%	-0.576	11.745	25.784%	0.596
Quantile 5	Monthly	0.001%	1.860%	-5.442%	4.796%	-0.597	12.499	0.305%	-0.023
	Quarterly	0.050%	2.398%	-6.598%	6.072%	-0.573	8.336	12.597%	0.305
	Semi-annually	0.043%	2.201%	-6.448%	5.593%	-0.825	11.286	10.897%	0.284
	Annually	0.097%	3.298%	-9.085%	8.809%	-0.413	6.824	24.443%	0.448
Long-short	Monthly	0.102%	1.988%	-5.221%	5.766%	0.247	15.176	25.741%	0.785
	Quarterly	0.031%	1.647%	-4.209%	5.114%	1.433	19.036	7.891%	0.264
	Semi-annually	0.037%	1.572%	-4.382%	4.312%	1.443	24.861	9.434%	0.339
	Annually	0.005%	1.852%	-4.405%	5.296%	0.631	8.665	1.341%	0.012
Benchmark	OMXSB	0.034%	1.411%	-4.044%	3.870%	0.044	7.896	8.652%	0.343
	All Swedish stocks	0.050%	1.356%	-3.948%	3.670%	-0.004	8.014	12.720%	0.545

Figures 4.a-e in appendix graph the total percentage return for all rebalancing frequencies of quantile 1, quantile 5 and the long-short portfolio over the whole sample period. The high mean returns for all rebalancing frequencies of quantile 1 and the low mean returns of monthly rebalancing of quantile 5 documented in Table 8 are mainly driven by the performance of the portfolios from 2010. Just as for the other factors, both the long and short leg as well as the long-short strategy follows the benchmarks more closely during the first five years of the sample period.

Table 9 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. The negative intercept at a 0.1 percentage level of significance with monthly rebalancing of the LRHD portfolio (quantile 5) under the CAPM confirms the presence of a statistically and economically significant daily alpha. Both the estimated excess return and the t-statistics for the LRHD portfolios decline as the rebalancing periods is lengthened, indicated by less negative and insignificant intercepts. The

estimated intercepts are insignificant and very small for the HRLD stocks across all rebalancing periods.

When controlling for the Fama-French three-factor and the Carhart four-factor model, more information is provided about the nature of the stocks in the two portfolios. Although all intercepts, except for the one-month rebalancing for the LRHD portfolio, are insignificant, the consistently large and significant coefficients on market risk premium suggest that the stocks in both the HRLD and LRHD portfolio are generally riskier than the market. The insignificant intercepts indicate that the high exposure to market risk is enough to explain the high average returns of the HRLD portfolio presented in Table 8. The HRLD portfolios are significantly and positively tilted towards MOM across all rebalancing periods, and also to the HML variable for the two longest rebalancing periods. The loadings indicate that the stocks behave like value-stocks that have performed well recently. In comparison, the LRHD stocks for the two longest rebalancing periods behave like growth-stocks that have performed poorly recently. Interestingly, the significant monthly rebalanced LRHD portfolio does not load significantly on any of the risk factors other than the market risk premium, and the large negative estimated risk-adjusted annual return of -15.62 percent is thus left unexplained by the four risk factors.

In line with the risk-adjusted returns of the LRHD and HRLD portfolio, the estimated intercept under CAPM of the monthly rebalanced long-short portfolio is economically and statistically significant. In particular, the estimated annual excess returns is 18.90 percent under the CAPM. The intercept remains significant at a 5 percentage level under Fama-French's three-factor model and the Carhart four-factor model. Miller (1977) and Stambaugh et al. (Stambaugh, Yu and Yuan, 2012) suggest that the zero-cost portfolio often is driven by a relatively larger overpricing of stocks in one leg. Considering the low significance of the HRLD, the significant monthly rebalanced portfolio of the long-short portfolio is likely a result of the significant monthly rebalanced LRHD portfolio.

The loadings of the long-short portfolio across all rebalancing periods indicate that the constituents are tilted towards value stocks that have performed well recently. Also, for the monthly rebalanced long-short portfolio the loading on the SMB factor becomes positive which indicates that the constituents behave like small stocks.

General Results of the Long-Short Portfolio Strategy

The high standard deviation and kurtosis, the negative skewness, and strong negative returns in the 1st percentile compared to the two benchmarks indicate high risk across all factor portfolios. Underlying the riskiness of the factor portfolios is the low diversification benefits

of the portfolios with sample sizes with as few as seven stocks in one portfolio (quantile) at certain points in time. The double amount of stocks in the long-short portfolios compared to the individual quantiles provide an important explanation to why the risk measures are lower for the long-short portfolios. The Sharpe ratios of the long-short portfolios are in general fairly better than that of benchmarks, but the Sharpe ratios never surpass one and are rarely above 0.7. As expected from the raw return statistics, the following risk-adjusted portfolios express high and significant loadings on the market risk premium across all factors. The beta even surpasses a loading of 2 for at least one holding period of either the short- or the long leg across all factors except for the Recommendation Dispersion factor. The consistent loadings of above 1 on the market risk premium along with insignificant intercepts for the risk-adjusted short- and long legs across all factors suggest that the high mean raw returns are just compensations for great exposure to market risk. As expected from a long-short strategy, the risk-adjusted zero-cost portfolios across all factors never display volatility above that of the market when looking at the loadings on the market risk premium.

Except for the Buy-signal Revision factor, which lacks loadings on other risk factors than the market risk premium, all risk-adjusted high-dispersion portfolios prove a clear pattern concerning loadings on the size-, value- and momentum-premium. Completely opposite to the findings of Diether et al. (2002), we find that the book-to-market ratios are negatively related to dispersion in analysts' forecasts. The loadings indicate that high-dispersion stocks behave like large growth stocks that have performed poorly over the past year ("loser stocks"). As expected, the significant loadings of the long-short strategies are the reverse of the significant loadings of the short legs. Thus the constituents of the long-short portfolios, again except the Buy-signal Revision factor, consistently behave as small value stocks that have performed well on average ("winner stocks").

The negative momentum loadings across the high-dispersion portfolios are in line with previous literature that negative abnormal returns are related to past losers (Jagdeesh and Titman, 1993) (Hong et al., 2000). Hong et al. (2000) also find that negative momentum is particularly pronounced for low coverage stocks. Along the theories of information diffusion, Hong et al. (2000) argue that low coverage stocks are proxies for information diffusion and that the information of bad news (bad past performance) travels slower than good news (good past performance), which results in the abnormal negative returns for past losers. Since our sample is based on a minimum analyst coverage of seven analysts, our results contradict the notion that the analyst coverage, and thus information diffusion, is especially crucial for the momentum return to analysts' forecasts that we find.

The significance of the risk-adjusted rebalancing frequencies concludes that a rebalancing (holding) period of one to a maximum of six months are optimal for high-dispersion and low-revision portfolios. All of the risk-adjusted factors document insignificant intercepts for the long leg of the zero-cost portfolio across all rebalancing frequencies. Again, this result is consistent with Miller's (1977) findings that high-dispersion stocks will underperform while low-dispersion stocks will not necessarily outperform. Except for the Recommendation Dispersion factor, all factors document significant intercepts for the long-short strategy under a monthly rebalancing frequency even after risk adjusting the returns according to the Carhart four-factor model. In particular, a risk-adjusted zero-cost portfolio under monthly rebalancing based on either the Target Price Dispersion factor, the Buy-signal Revision factor or the Combination factor has generated significant estimated annual excess returns under the Carhart four-factor model of 21.17, 21.67 and 19.66 percent respectively. Meanwhile, a buy-and-hold strategy of the OMXSB and the benchmark of all Swedish stock respectively has generated mean annual returns of 8.65 and 12.72 percent respectively. Since the results of the long-short portfolios remain after adjusting for the Carhart four-factor model, our strategies are not likely to be a result of common systematic risk exposures.

The monthly rebalancing frequency indicates a more practicable strategy than the academically prevalent daily rebalancing. Barber et al. (2012) test for different holding periods of long-short strategies based analysts' recommendation on US stocks, and find that there are no significant abnormal returns to rebalancing periods longer than daily. Our results therefore both indicate a more practical opportunity and that market characteristics likely play a role in the profitability of a long-short strategy on analysts' recommendations. Nevertheless, even though the lower frequency is useful in addressing the practical ability, we recognise that we do not have a perfect measure of the specific transaction cost of each stock and therefore cannot confidently rule out variations in net returns of investing according to our long-short strategies in practice.

In the light of the MiFID II, our results prove the benefits of using or considering analysts' estimates in portfolio management. For institutional or individual investors that are long-only, the high risk and negative performance of the high-dispersion stocks indicate that these stocks should be avoided or excluded from the portfolios. An investor with the ability to short can benefit from the negative relation between dispersion in forecasts and future returns by employing the zero-cost portfolio strategy with monthly rebalancing.

Our results question the theoretical centrepiece behind momentum, the idea presented by Miller (1977) that when opinions diverge and when short-selling constraints prevail,

pessimistic investors will be restricted from selling stocks and stock prices will reflect the view of the optimistic investors. According to the rationale by Miller (1977), our sample consisting of the liquid and investable OMXSB should not exhibit any noteworthy levels of abnormal returns following momentum in diverging opinions. Nevertheless, our results show significant estimated excess returns both for the long-short strategy as well as for the short leg of the portfolio. Our results therefore better align with Diether et al. (2002) that extend the short-selling restriction to that any market friction that prevents the revelation of negative opinions will produce the negative relation between dispersion in forecasts and future returns.

Since our significant abnormal returns are yielded from our investable and liquid sample, we deviate from the idea of market frictions being the existence of gradual information diffusion (Hong et al. 2000). The large stock and high analyst coverage characteristics of our sample are the complete reverses of the small stocks and low analyst coverage features that are used as proxies for information diffusion in Hong et al. (2000). Since information, according to the theory of information diffusion by Hong et al. (2000), should flow faster when the stock is large and covered by more analysts, our strategies on our sample should generate insignificant returns. Nevertheless, we document significant abnormal returns both for the long-short strategy as well as for the short leg of the portfolio.

Instead, the apparent market friction of our sample aligns with the literature body of behavioural finance. The market friction and our following momentum effect could be a result of behavioural irrationalities of investors, rather than prevailing short-selling constraints or information diffusion. The negative momentum returns are supportive of the overconfidence and biased self-attribution theories put forward by Daniel et al. (1998). According to Daniel et al. (1998), investors have overconfidence in their ability to value stocks, which leads them to underestimate their forecast error variance, and their biased self-attribution lead them to only partly correct their positions when faced with public information that opposes their private signal. The underreaction related to the low-revision stocks is indicative of overconfident investors that remain confident and in a biased manner only partially correct their positions. The investor can remain even more confident about his position when judging stocks with high-dispersion in analysts' estimates, by biasedly acknowledging the recommendation that aligns the most with his position.

5.1 Robustness

To explore the robustness of our study, we employ three different robustness checks. Firstly, we test for a lag in portfolio formation by using three, six, and twelve months revision periods in the Buy-signal Revision factor and the Combination factor. The returns are risk adjusted under the CAPM, Fama-French three-factor model and Carhart four-factor model. Secondly, we employ a sub-period analysis where we calculate risk-adjusted returns using the CAPM and the Carhart four-factor model for all factors and holding periods but over three time periods; 2005-2009, 2009-2013 and 2013-2017. Lastly, we test the returns to Target Price Dispersion, Recommendation Dispersion, Buy-signal Revision and the Combination factor, but with equal-weighted portfolios instead of value-weighted portfolios for all holding periods.

5.1.1 Lag in portfolio formation

We test for a lag in portfolio formation by using three, six and twelve months revision periods in the Buy-signal Revision factor. The portfolios are created by taking the ratio between the number of total buy recommendations to the number of total recommendations for each stock at the rebalancing date, divided by the same ratio three months, six months and twelve months back in time respectively. As the Buy-signal Revision measure is a part of the Combination factor, the Combination factor will also be analysed over the three different revision periods.

Buy-signal Revision – three months back in time

Table 10 in appendix presents the estimated daily returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French three-factor model and the Carhart four-factor model. Different results emerge compared to the revision period of only one month. The intercepts of the high-revision portfolio (quantile 1) is now significant and negative with semi-annual and annual rebalancing. Also, the intercepts for monthly and quarterly rebalancing are now negative, but still insignificant. The significance of the monthly rebalanced low-revision portfolio (quantile 5) disappears, leaving all intercepts insignificant for the low-revision portfolio.

The intercept of holding high-revision stocks for either six or twelve months is still significant after controlling for other factors than the market risk premium. The market risk premium coefficients are positive and over 1 for both high- and low-revision stocks, suggesting

that the portfolios are riskier than the market. The high-revision portfolios with either a six- and twelve-months holding period load positively on the momentum factor, indicating that the portfolio constituents behave like stocks that have performed well recently.

The intercepts of the long-short strategy are insignificant for all rebalancing frequencies. Adjusting for the Fama-French three-factor model and also the momentum variable provides no additional explanatory value.

Buy-signal Revision – six months back in time

Table 11 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French three-factor model and the Carhart four-factor model. All intercepts are insignificant for both low- and high-revision stocks, and all intercepts are negative except for low-revision stocks with six or twelve-month holding periods. Controlling for Fama-French three-factor model and the Carhart four-factor model does not provide any additional explanatory value about the portfolios. Given the insignificant daily returns of the low- and high-dispersion stocks, the returns are as expected insignificant and negative for the long-short strategy.

Buy-signal Revision – twelve months back in time

Table 12 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French three-factor model and the Carhart four-factor model. The intercepts for both high- and low-revision stocks are insignificant for all holding periods. Controlling for Fama-French three-factor model and also the momentum factor, the semi-annual rebalanced high-revision stocks load significant and positively on the momentum factor, whereas the monthly and quarterly rebalanced low-dispersion stocks load significant and negatively on the momentum factor. The returns of the long-short strategy are as expected insignificant and negative. The three-factor model and the four-factor model present significant and positive loading on the momentum factor for monthly, quarterly and semi-annual rebalancing.

General results of Lag in portfolio formation for Buy-signal Revision

While the Buy-signal Revision measure with one-month-revision presented significant negative estimated excess returns when rebalancing the low-revision stocks monthly, the robustness check of the Buy-signal Revision measure with different revision periods presents no such significance. In general, the outcomes of the Buy-signal Revision over longer revision

periods are insignificant and not consistent with the loadings and intercepts signs of the one month revision period. The rationale behind the difference in performance of the low-revision portfolio across different revision periods is probably because of the different information available in analysts' forecasts at different points in time. As a case in point, Diether et al. (2002) document that as lags in portfolio formation increase, returns drop as a result of the information being stale. Diether et al. (2002) argue that disappointed investors have already sold their stocks, resulting in that prices on the stocks in the portfolio have already fallen. Therefore, the Buy-signal Revision factor performs best when the revision between the number of buy-recommendations to the total number of recommendations is as short as one month.

The apparent long-term reversal of high-revision stocks, indicated by the new significant negative intercepts for high-revision stocks over the two longest rebalancing periods, could be a result of Daniel et al. (1998) so-called biased self-attribution effect. Overconfident investors find supportive public information as a validation of their beliefs but only partly revise their own positions when the information contradicts their private signal. This means that the stock prices are corrected in the long-term as the market gradually recognises its past errors.

Combination– three months back in time

Table 13 presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. The intercept when rebalancing the LRHD portfolio (quantile 5) monthly under the CAPM is significant, yet the value and significance are lower compared to the Combination factor looking one month back in time. Also, the LRHD portfolio with quarterly rebalancing is significant under the CAPM, although at a lower significance level than the monthly rebalanced LRHD portfolio. As with the monthly revision period, the returns and the significance decrease accordingly for the LRHD portfolio as the rebalancing periods is lengthened, indicated by the insignificant and close to zero intercepts. For the HRLD stocks (quantile 1) all estimated intercepts are insignificant and all, except for the intercept of the twelve months holding period, are positive.

Even when controlling for other factors than the market risk premium, large negative returns are left unexplained for the LRHD portfolio with monthly and quarterly rebalancing. The market risk premium coefficients for the monthly or quarterly rebalancing of the LRHD portfolio are at, or close to, 1, suggesting that the risk of the portfolios is similar to average market risk. Interestingly, the insignificant LRHD and HRLD portfolios all have substantially

larger coefficients for the market risk premium. Thus, whereas the market risk premium is enough to explain any abnormal returns of the other portfolios, monthly or quarterly rebalancing of the LRHD portfolio is not as exposed to market risk, and large estimated excess returns are left unexplained. The pattern of loadings for the LRHD portfolio under the one month revision period is reinforced under the three month revision period, while the HRLD no longer load on any of the value- or size-premiums for all rebalancing periods. The LRHD portfolios have significant negative loading on the value-, size- and momentum-premiums for all rebalancing periods except the annual. The HRLD portfolio loads significant and positively on the momentum factor just as for the one month revision period.

The significance of returns and loadings of the long-short strategy is very similar to the long-short strategy of the Combination factor looking one month back in time. Table 13 in appendix reports the economic and statistically significant daily returns of the long-short strategy when rebalancing the portfolio monthly and quarterly. In particular, estimated annual excess returns of 23.12 and 17.39 percent have been achieved with monthly and quarterly rebalancing, respectively. In comparison, the long-short strategy of the Combination factor looking one month back in time has generated estimated annual excess returns of 19.66 percent.

Combination – six months back in time

Table 14 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. The intercept with a monthly rebalancing of the LRHD portfolio is significant, yet the significance at a 5 percentage level is lower compared to the Combination factor looking one month or three months back in time where the significance is at a 0.1 percentage level. Both the estimated daily excess return and the significance decreases accordingly for the LRHD portfolio as the rebalancing periods is lengthened, indicated by less negative and insignificant intercepts for longer holding periods. The estimated intercepts are all insignificant and positive for the HRLD portfolios, except from the twelve months holding period which has negative estimated daily returns.

The alpha of the monthly rebalanced LRHD portfolio remains significant even after controlling for the three Fama-French factors and the Carhart four-factor model. The pattern of loadings proves similar to the Combination factor looking one month back in time with negative loadings on the size-, value- and momentum-premiums. Both the LRHD and HRLD portfolios continue to have a large exposure to market risk, indicated by the high loadings on the market risk premium.

Monthly rebalancing of the arbitrage portfolio generates significant estimated annual excess returns of 17.64 percent under the Carhart four-factor model and is less risky than the average market, suggested by the small coefficient on the market risk premium. The returns and associated t-values decline for longer holding periods of the long-short portfolio. The Fama-French's three-factor model and the three-factor model augmented by the momentum factor present positive and mixed significant loadings on the MOM and SMB variables, as expected given the nature of the stocks in the long leg (HRLD) and the short leg (LRHD).

Combination – twelve months back in time

Table 15 presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and Carhart four-factor model, respectively. As expected from the theory of lag and price adjustments (Diether et al., 2002), the intercept of the LRHD portfolio with monthly rebalancing is no longer significant, and all other portfolios also remain insignificant. The three Fama-French's factors and the momentum variable does not change the significance of the intercepts. The long-short strategy does not provide any significant returns either.

General results of Lag in portfolio formation Combination

The analysis of lags in portfolio formation in the Combination factor demonstrate the robustness of our main findings from the Combination factor. The estimated excess return for monthly rebalancing remains significant even with lag in the revision of three and six months, albeit less significant. The lack of significance under annual lag in revision is intuitively reasonable from the lack of precision in forecasts for one year, and also further support the theory of lag and price adjustments by Diether et al. (2002).

Even though the robustness is intriguing for confirmation of our main results, the documented findings are counterintuitive from the findings of the separate Buy-signal Revision factor lags where the significant monthly rebalancing low-revision for one month revision period becomes insignificant. The results from the Combination factor indicate that the Target Price Dispersion factor is an important factor for the success of the lagged combination of the two factors. One interpretation is that the Target Price Dispersion adds a sorting element that aligns well with the initial portfolios resulted by the Buy-signal Revision factor.

5.1.2 Sub-period Analysis

We test for differences in portfolio performance over time by dividing our sample into three sub-periods; March 2005 to February 2009, March 2009 to January 2013, and February 2013 to January 2017.

Target Price Dispersion

Table 16 and Table 17a-b in appendix present the estimated daily excess returns for all rebalancing frequencies for quantile 1, quantile 5 and the long-short portfolio under the CAPM and the Carhart four-factor model, for the three sub-periods respectively. For the 2005-2009 period and 2009-2013 period, the estimated excess returns of all holding periods of both the high-dispersion portfolio (quantile 5) and the low-dispersion portfolio (quantile 1) are insignificant. The returns are likely explained by the exposure to market risk, as indicated by the high and significant betas to the market risk premium factor.

For the 2013-2017 period, the intercepts of the high-dispersion portfolios are significant for all holding periods, especially when holding the portfolio for six or twelve months. This implies that shorting or simply avoiding the stocks with the biggest relative spread in analysts' target price during latest sub-period has been a very good investment strategy. The four intercepts are still significant after controlling for the Carhart four-factor model. The loadings for the significant high-dispersion portfolio have shifted from significant loadings on the size-, value- and momentum factors for the total sample period to become largely dependent on the market risk premium in the 2013-2017 period. The quarterly rebalanced high-dispersion portfolio even have a beta for the market risk premium above 3, and the other rebalancing periods have a beta either above or slightly below 2.

The long-short strategy presents insignificant estimated excess returns during the 2005-2009 period and the 2009-2013 period. However, the quarterly or semi-annually rebalancing of the long-short portfolio has generated significant estimated excess returns in the 2013-2017 period. Large estimated excess returns are left unexplained after controlling for the four-factor model. In particular, holding the quantile of the low-dispersion stocks and selling the quantile of the high-dispersion stocks every three or six months has generated excess annual returns of 41.83 and 36.04 percent respectively in the 2013-2017 period. This is much higher compared to the return of a buy-and-hold strategy of either the OMXSB benchmark or the index consisting of all Swedish stocks, which during the same period had annual mean returns of 9.76 and 14.66 percent respectively (Table 28 in the appendix). The exposure to the market

risk are lower for the significant long-short portfolios compared to the significant high-dispersion portfolios. Both of the successful long-short strategies also load significant and positively on the HML and momentum factor, which aligns well with the loading for the entire time period.

Recommendations Dispersion

Table 18 and Table 19a-b in appendix present the estimated daily excess returns for all rebalancing frequencies for quantile 1, quantile 5 and the long-short portfolio under the CAPM and the Carhart four-factor model, respectively, divided between the three sub-periods. For the 2005-2009 period, the estimated excess returns of different holding periods of both the high-dispersion portfolio (quantile 5) and the low-dispersion portfolio (quantile 1) are insignificant. For the 2009-2013 period, the intercept of the high-dispersion portfolio with monthly rebalancing is significant. The value of the intercept decreases under the four-factor model but remains significant.

The estimated daily excess return is significant for all holding periods of the high-dispersion portfolio in the 2013-2017 period. Interestingly, the estimated daily excess return increases with less frequent rebalancing periods. For the low-dispersion portfolios in the 2013-2017 period, the quarterly rebalanced low-dispersion portfolio has a significant and negative alpha. After controlling for the four risk factors, large unexplained estimated excess returns is left for the quarterly rebalanced low-dispersion portfolio and all rebalancing periods for the high-dispersion portfolios. In particular, annual rebalancing of high-dispersion stocks have generated estimated annual excess returns of -23.44 percent in the 2013-2017 period. This implies that shorting or simply avoiding the stocks with the biggest standard deviation in analysts' buy-, sell- and hold-recommendations during the 2013-2017 period has been a very good investment strategy. Similar to the Target Price Dispersion over the 2013-2017 period, the loading on the market risk premium is significant and higher than for the earlier sub-periods. The exposure to market risk increase over time, which align well with the plotting of the mean raw return shown in Figure 2.a-e.

In contrast to the statistically and economically significant long-short strategy with monthly rebalancing over the whole sample period, the long-short strategy does not generate significant intercepts for any rebalancing period in any of the three sub-periods.

Buy-signal Revision

Table 20 and Table 21a-b in appendix present the estimated daily excess returns for all rebalancing frequencies for quantile 1, quantile 5 and the long-short portfolio under the CAPM and the Carhart four-factor model, respectively, divided between the three sub-periods. Table 20 document insignificant alphas for both the high-revision portfolio (quantile 1) and the low-revision portfolio (quantile 5) in the 2005-2009 period. Just as when looking at the whole sample period, the constant for the monthly rebalancing of low-revision stocks is highly significant at a 1 percentage level in the 2009-2013 period (Table 20). The intercept becomes even more significant (0.1 percentage significance level) under the Carhart four-factor model (Table 21a). None of the high-revision stocks documents significant alphas under the corresponding period.

For the 2013-2017 period, the semi-annual rebalancing of high-revision (quantile 1) stocks yield a significant and negative constant. In particular, the portfolio strategy has produced estimated excess returns under the CAPM of -24.95 percent yearly at a 5 percentage significance level. The significance also remains after including risk factors according to the Carhart four-factor model (Table 21b). None of the low-revision portfolios documents significant intercepts over the 2013-2017 period. Just as for the Target Price Dispersion and Recommendation Dispersion factor, the exposure to market risk increases significantly for all portfolios during the latest sub-period.

The long-short portfolios show insignificant intercepts for all sub-periods. The significant abnormal returns achieved after monthly rebalancing of the long-short portfolio over the whole sample period seems to be a combination of the significant estimated excess returns of the monthly rebalanced low-revision portfolio during the 2009-2013 period and the semi-annual rebalanced high-revision portfolio in the 2013-2017 period. As the seemingly good performance of the long-short strategy over the whole sample period hasn't been consistent when dividing it into three different time periods, we cannot establish a clear time pattern for the continued success of the long-short strategy.

Combination

Table 22 and Table 23a-b in appendix present the estimated daily excess returns for all rebalancing frequencies for quantile 1, quantile 5 and the long-short portfolio under the CAPM and the Carhart four-factor model, respectively, divided between the three sub-periods. The alphas are insignificant for both the HRLD portfolio (quantile 1) and the LRHD portfolio (quantile 5) during the 2005-2009 period. Over both the 2009-2013 period and the 2013-2017 period, the estimated daily excess return of the LRHD portfolio with one-month holding is

highly significant. The significance and magnitude of the intercept remain at a similar level also under the Carhart four-factor model. The signs on the factor coefficients have been consistent but mostly insignificant over the three time periods; HRLD stocks behave like small value-stocks that have performed well while LRHD stocks behave like big growth-stocks that have performed poorly. More importantly, the loading on the market risk premium increases dramatically over the sub-periods. On the back of the insignificant size-, value- and momentum-factors, the significant and high loading on the market risk premium indicate that the returns of the insignificant portfolios are driven by the exposure to market risk.

Interestingly, even though the Combination factor had a significant alpha for the monthly rebalancing of the long-short strategy over the total sample period, all sub-periods' long-short strategies have insignificant alphas. Since the estimated daily excess return is highly significant with a monthly rebalancing of the LRHD portfolio for both the 2009-2013 period and the 2013-2017 period, the economic and statistical significance of the monthly rebalanced long-short portfolio over the entire sample period is likely to be driven by the short leg.

General results of Sub-period analysis

Our results prove robust to the latter time periods, but the lack of significance in the 2005-2009 period across all strategies raises questions. None of the factors has generated any significant estimated excess return in the 2005-2009 period. It is difficult to disregard that this is not simply a reflection of noise in our sample, or a reflection of the financial crisis, but considering the relation between sample size and level of significance, we have reason to deem differently. As an increased number of stocks decrease the standard deviation in a portfolio, the number of stocks in a portfolio is positively correlated to the t-value and level of significance. One important explanation to the insignificance of the 2005-2009 period is therefore the low number of stocks in the universe compared to the other two sub-periods. The number of stocks in the universe during the 2009-2013 period and the 2013-2017 period are considerably more than in the first sub-period (Table 1).

However, as the number of stocks in the universe has been about the same over the last two sub-periods, the number of stocks is not providing any explanatory value to why both of the two dispersion factors performed much better in the 2013-2017 period compared to the 2009-2013 period. The average number of analysts covering each stock in the universe is the about the same in the two sub-periods and provides no additional contribution in explaining the mixed performance over time (Table 1). Instead, the results can be explained by the increased exposure to market risk and the related growth of the benchmarks. As shown in

Figures 1a-4e and Table 28, the benchmarks grew substantially during the later sub-periods, and during the same time both quantiles generated greater returns.

The superior performance during the last period is also possible to explain from the perspective of behavioural finance. In the shadow of the financial crisis, the average sentiment on the Swedish stock market during the 2009-2013 period was generally lower compared to the more optimistic sentiment in the 2013-2017 period. As an investor can become anchored on the economic condition of a country or stock (Pompian, 2006), investors in the 2013-2017 period were probably more likely to underreact following the negative public news, thus creating longer momentum compared to the 2009-2013 period.

5.1.3 Equal-weighted portfolios

In this section, we use the four factors but weigh the stocks equally within the portfolios. The main idea of testing equal-weighted strategies is to study how the returns are affected when smaller stocks have a greater weight in the portfolios compared to the value-weighted portfolios.

Target Price Dispersion

Table 24 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. Table 24 documents improvement of the long leg (quantile 1) when equal-weighted, concluded by the nearly twice as large intercepts compared to the value-weighted portfolio and the significant annual rebalanced low-dispersion portfolio under the Carhart four-factor model. The semi-annual rebalanced high-dispersion portfolio (quantile 5) becomes significant, instead of the annual rebalanced high-dispersion portfolio under value-weighted portfolios. The risk is about the same as the value-weighted portfolios, indicated by the comparable loadings on the market risk premium.

The market adjusted excess daily returns of the equal-weighted long-short strategy are significant for the same period as the value-weighted long-short strategy but considerably higher. Table 24 reports the continued significance under the Carhart four-factor model, and also the increased magnitude of the intercepts. Specifically, the four-factor adjusted equal-weighted long-short portfolio with an annual holding period has generated up to 29.48 percent

in estimated annual excess return, which in turn is 7.05 percentage points better than the value-weighted long-short portfolio with annual rebalancing.

Recommendation Dispersion

Table 25 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. None of the high- or low-dispersion portfolios generates significant alphas over any holding period. On the back of the mainly insignificant loadings on other factors than the market risk premium, the returns of the equal-weighted portfolios seem to be largely explained by exposure to market risk.

Whereas the value-weighted long-short strategy was unsuccessful, the equal-weighted long-short strategy performs even more poorly. Both intercepts and significance close to zero for monthly and quarterly rebalancing of the long-short strategy.

Buy-signal Revision

Table 26 in appendix presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. Just as for the value-weighted portfolios, the monthly rebalanced low-revision portfolio (quantile 5) is significant, but at a lower significance (5 percentage significance level) than for the value-weighted equivalent (1 percentage significance level). None of the holding periods of the long leg (quantile 1) generates significant alphas, but the intercepts improve both in magnitude and in t-value compared to the value-weighted high-revision portfolios. The improvement of the long leg is not enough to offset the loss in the significance of the monthly rebalanced low-revision portfolio, and the monthly rebalanced arbitrage portfolio therefore no longer generates a significant alpha as it did for the value-weighted portfolio strategy of the Buy-signal Revision factor.

Combination

Table 27 presents the estimated daily excess returns for all holding periods for quantile 1, quantile 5 and the long-short portfolio under the CAPM, the Fama-French's three-factor model and the Carhart four-factor model. Similar to the Buy-signal Revision factor, the monthly rebalanced LRHD portfolio (quantile 5) generates significant alpha also under equal-weighted returns, but at a lower significance (1 percentage significance level) than the value-

weighted equivalent (0.1 percentage significance level). Just as for the long leg of the Buy-signal Revision, the value and significance of HRLD portfolios' intercepts (quantile 1) improve for all holding periods under equal-weighted portfolio structure. The exposure to market risk increases marginally for most portfolios under equal-weighted returns, and a majority of the loadings on the value-premiums becomes insignificant.

The equal-weighted long-short portfolio with a one-month holding period has generated 29.99 percent in estimated annual excess return under the Carhart four-factor model, which is 10.33 percentage points more compared to the monthly rebalancing of the value-weighted long-short portfolio. The increased profits of the long-short strategy likely arise from the improvement of the long leg.

General results of equal-weighted portfolios

In general, the small stocks have contributed to a noteworthy upswing in the returns for the long leg whereas the short leg perform worse than under value-weighted returns. Across all factors, the significance of the short legs' intercepts of the equal-weighted counterparts either remain or decrease, and the magnitude of the intercepts consistently decrease.

The increased estimated excess returns and significance of the long-short portfolios that are evident for the Target Price Dispersion factor and the Combination factor are derived from improvement in the long leg. This also explains why the long-short strategy for the Buy-signal Revision factor no longer shows significance for the monthly rebalanced long-short portfolio, since the results were largely driven by the short leg which under equal-weighting proved to be less pronounced.

According to Hong et al. (2000), a lower rate of information diffusion among investors leads to a stronger earnings momentum effect. As market size is used as a proxy for information diffusion, weighing up small stocks in the high-dispersion portfolio would theoretically generate more pronounced momentum. Similarly, Diether et al. (2002) document that smaller stocks generate larger momentum as the short-selling restraints is greater than for larger stocks. However, these theories stand in contrast to our findings. Either our small stocks are too big to be considered as stocks with a low rate of information diffusion, or the findings of Diether et al. (2002) about short-selling restraints and the connection to stock size does not hold true for our sample. Both suggestions are easily explained by our sample characteristics. Since we base our sample on the OMXSB, we limit our universe to larger stocks with high analyst coverage. Thereby, we deliberately avoid illiquid and small stocks with low analyst coverage that are related to a slower rate of information diffusion and short-selling restraints.

6. Conclusion

Our study shows that it is possible for an investor to employ profitable zero-cost portfolio strategies on the OMX Stockholm Benchmark Index (OMXSB) that exploit momentum following analysts' forecasts. A long-short portfolio under monthly rebalancing created using the Target Price Dispersion factor, the Buy-signal Revision factor or the Combination factor, has generated significant estimated annual excess returns under the Carhart four-factor model of 21.17, 21.67 and 19.66 percent respectively. Meanwhile, a buy-and-hold strategy of the OMXSB and the benchmark of all Swedish stocks respectively has generated mean annual returns of 8.65 and 12.72 percent respectively. As the results remain after adjusting for the Carhart four-factor model, this indicates that our returns are not simply a result of systematic risk exposures.

Our results extend the power of earlier literature in finding significant and consistent estimated excess returns for monthly, instead of daily, rebalancing by exploiting momentum on analysts' forecasts. Similar to the optimal rebalancing (holding) period of the long-short strategy, we conclude that a rebalancing (holding) period over one to a maximum of six months is significant for the short leg of the zero-cost portfolios. When testing for robustness, we find that the revision period of one month is central to our findings of the Buy-signal Revision factor, but that the Combination factor is robust to revision periods up to six months. The robustness check also show that the results over the sample period are largely driven by the two latest sub-periods; 2009-2013 and 2013-2017. Furthermore, we document that when the performance of the long-short portfolio improves under equal-weighted portfolios the improvement is derived from development of the long leg.

The significant momentum returns together with the liquid and investable characteristics of our sample contradict the theoretical core of short-selling constraint as the main driver behind momentum from divergence in opinions among investors (Miller, 1977). Our significant risk adjusted returns align more with the theory of Diether et al. (2002) that any market friction, not necessarily short-selling constraints, will produce the negative relation between dispersion in forecasts and future returns. Our sample characteristics also contradicts the possibility that our market friction is derived from the theory by Hong et al. (2000) of information diffusion since the proxies for information diffusion used by Hong et al. (2000) are small stocks and low analyst coverage. The fact that we are able to generate abnormal momentum returns by deliberately choosing liquid and large stocks adds to the practical benefits of the strategies presented in our paper and earlier literature.

As predicted by the literature, we find across all factors that the high-dispersion portfolio significantly underperforms while the low-dispersion stocks not necessarily outperform (Stambaugh et al., 2012) (Johnson, 2004) (Miller, 1977). The same pattern emerges for the Buy-signal Revision factor where the low revision portfolio has significant and negative intercepts while the intercepts for the high-revision portfolio shows mixed and insignificant signs. The high mean return of the long legs are explained by the significant exposure to market risk, proven by the loadings on the market risk premium and insignificant alphas. Thus, our results does not only suggest abnormal returns from a zero-cost portfolio based on analysts' forecasts, but also an opportunity for meaningful performance improvement for a long-only investor from avoiding the stocks with high-dispersion in Target Price or Recommendation estimates, or low-revision in Buy-signal estimates.

Important to note for the practical implementation of our study is the high risk characteristics shared across all portfolios. All factors share significant loadings on the market risk premium, high standard deviation and kurtosis, as well as negative skewness. Furthermore, the small sample sizes with as few as seven stocks in one portfolio at certain points in time translates to low diversification benefits which further adds to the risk of the portfolios. The somewhat higher Sharpe ratios compared to the benchmarks shows that investors are partially compensated for the additional risk they take on.

The significant alphas of the latter time periods (2009-2013 and 2013-2017) and the documented possibility to generate abnormal returns from a long-short portfolio based on analysts' forecasts estimates also provide insights to the current topic of MiFID II. Seemingly, analysts' forecasts has a value both for investors without short-selling restraints and for long-only investors. For investors interested in investing in the OMXSB, it is likely helpful to continue to use analysts' forecasts also under the MiFID II. However, since our results are not robust over all sub-periods, we cannot with confidence conclude that the results will remain consistently going forward.

Since our long-short strategy proved significant alpha for only one of our two dispersion measures, we suggest for further research an analysis across several dispersion measures to conclude the characteristics of the most successful dispersion measures. It would also be interesting to see whether the abnormal returns from analysts' estimates are industry related. Above all, we suggest a study on a larger sample of stocks over a longer period of time. Even though a larger sample might call for more relaxed restrictions, such as our minimum analyst coverage of seven analysts, we believe that it would give a more accurate image of the corresponding risks and risk related returns of the strategy.

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8. Appendices

The security universe is based on the OMX Stockholm Benchmark with restrictions over the period from the 31st of March 2005 to the 2nd of January 2017.

Table 3, Table 5, Table 7 and Table 9 present time-series regressions over the value-weighted daily returns for four different holding periods of quantile 1, quantile 5 and the long-short portfolio for the Target Price Dispersion factor, Recommendation Dispersion factor, the Buy-signal Revision factor and the Combination factor, respectively. The CAPM, the Fama-French's three factor model and the Carhart four-factor model over the portfolios' daily returns are employed in three separate steps. The intercept (alpha) is the estimated daily excess return in percentage and the coefficients on the market risk premium and the value-weighted SML, HML and MOM variables are factor loadings, or sensitivities, on those risk premium factors.

Table 10, Table 11 and Table 12 present time-series regressions over the value-weighted daily returns for four different holding periods of quantile 1, quantile 5 and the long-short portfolio for either three, six and twelve months revision periods in the Buy-signal Revision factor, respectively. The CAPM, the Fama-French's three factor model and the Carhart four-factor model over the portfolios' daily returns are employed in three separate steps. The intercept (alpha) is the estimated daily excess return in percentage and the coefficients on the market risk premium and the value-weighted SML, HML and MOM variables are factor loadings, or sensitivities, on those risk premium factors.

Table 13, Table 14 and Table 15 present time-series regressions over the value-weighted daily returns for four different holding periods of quantile 1, quantile 5 and the long-short portfolio for either three, six and twelve months revision periods in the Combination factor, respectively. The CAPM, the Fama-French's three factor model and the Carhart four-factor model over the portfolios' daily returns are employed in three separate steps. The intercept (alpha) is the estimated daily excess return in percentage and the coefficients on the market risk premium and the value-weighted SML, HML and MOM variables are factor loadings, or sensitivities, on those risk premium factors.

Table 16, Table 18, Table 20 and Table 22 present the CAPM over the value-weighted daily returns of quantile 1, quantile 5 and the long-short portfolio for four different holding periods of the Target Price Dispersion factor, Recommendation Dispersion factor, the Buy-signal Revision factor and the Combination factor respectively, divided over three time periods; March 2005 to February 2009, March 2009 to January 2013, and February 2013 to January 2017. The intercept (alpha) is the estimated daily excess return in percentage and the

coefficients on the market risk premium and the value-weighted SML, HML and MOM variables are factor loadings, or sensitivities, on those risk premium factors.

Table 17a-b, Table 19a-b, Table 21a-b and Table 23a-b present the three Fama-French factors augmented by the momentum variable over the value-weighted daily returns of quantile 1, quantile 5 and the long-short portfolio for four different holding periods of the Target Price Dispersion factor, Recommendation Dispersion factor, the Buy-signal Revision factor and the Combination factor respectively, divided over three time periods; March 2005 to February 2009, March 2009 to January 2013, and February 2013 to January 2017. The intercept (alpha) is the estimated daily excess return in percentage and the coefficients on the market risk premium and the value-weighted SML, HML and MOM variables are factor loadings, or sensitivities, on those risk premium factors.

Table 24, Table 25, Table 26 and Table 27 present time-series regressions over the equal-weighted daily returns for four different holding periods of quantile 1, quantile 5 and the long-short portfolio for the Target Price Dispersion factor, Recommendation Dispersion factor, the Buy-signal Revision factor and the Combination factor, respectively. The CAPM, the Fama-French's three factor model and the Carhart four-factor model over the portfolios' daily returns are employed in three separate steps. The intercept (alpha) is the estimated daily excess return in percentage and the coefficients on the market risk premium and the equal-weighted SML, HML and MOM variables are factor loadings, or sensitivities, on those risk premium factors.

Figures 1a-e graph the total percentage return for all rebalancing frequencies of quantile 1, quantile 5 and the long-short portfolio for the Target Price Dispersion factor over the entire sample period.

Figures 2a-e graph the total percentage return for all rebalancing frequencies of quantile 1, quantile 5 and the long-short portfolio for the Recommendation Dispersion factor over the entire sample period.

Figures 3a-e graph the total percentage return for all rebalancing frequencies of quantile 1, quantile 5 and the long-short portfolio for the Buy-signal Revision factor over the entire sample period.

Figures 4a-e graph the total percentage return for all rebalancing frequencies of quantile 1, quantile 5 and the long-short portfolio for the Combination factor over the entire sample period.

Table 3. Target Price Dispersion

	Quantile 1				Quantile 5				Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually
CAPM	Market Risk	2.064***	1.549***	1.560***	1.914***	1.504***	1.922***	1.513***	1.422***	0.560***	-0.373***	0.0466	0.493***
	Beta	(37.53)	(38.48)	(34.52)	(35.04)	(46.82)	(35.90)	(42.37)	(45.69)	(12.34)	(-9.86)	(1.42)	(12.00)
	Alpha	0.041%	0.028%	0.039%	0.046%	-0.036%	-0.017%	-0.035%	-0.040%*	0.077%*	0.041%	0.071%*	0.082%*
	<i>N</i>	(1.10)	(1.02)	(1.24)	(1.22)	(-1.71)	(-0.53)	(-1.60)	(-2.04)	(1.99)	(1.18)	(2.16)	(2.18)
	<i>R</i> ²	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
Fama-French's three-factor model	Market Risk	2.094***	1.578***	1.580***	1.941***	1.463***	1.858***	1.473***	1.387***	0.631***	-0.280***	0.107**	0.554***
	Beta	(35.10)	(36.07)	(32.76)	(33.82)	(40.76)	(29.54)	(35.31)	(37.24)	(12.19)	(-5.59)	(2.71)	(12.08)
	SMB	0.051	0.051	0.034	0.046	-0.079***	-0.124*	-0.081*	-0.068	0.130***	0.175***	0.115***	0.114**
	HML	(1.47)	(1.77)	(1.17)	(1.33)	(-2.58)	(-2.19)	(-2.08)	(-1.90)	(3.61)	(2.96)	(3.03)	(3.16)
	Alpha	-0.029	-0.007	-0.029	-0.014	-0.146***	-0.205***	-0.178***	-0.126***	0.117*	0.198***	0.149**	0.112*
Carhart four-factor model	Market Risk	2.105***	1.585***	1.590***	1.951***	1.454***	1.850***	1.465***	1.378***	0.651***	-0.264***	0.125**	0.573***
	Beta	(34.72)	(35.59)	(32.19)	(33.42)	(41.13)	(29.79)	(36.05)	(37.93)	(12.28)	(-5.33)	(3.21)	(12.37)
	SMB	0.071	0.064*	0.054	0.064	-0.096***	-0.139**	-0.094**	-0.085**	0.167***	0.203***	0.148***	0.150***
	HML	(1.74)	(1.99)	(1.57)	(1.67)	(-3.32)	(-2.61)	(-2.67)	(-2.58)	(3.75)	(3.48)	(3.92)	(3.80)
	Alpha	0.046	0.045	0.046	0.057	-0.210***	-0.263***	-0.229***	-0.191***	0.256***	0.308***	0.275***	0.248***
Carhart four-factor model	Market Risk	0.176***	0.122***	0.177***	0.168***	-0.153***	-0.137**	-0.122***	-0.152***	0.329***	0.259***	0.300***	0.320***
	Beta	(4.05)	(3.55)	(4.51)	(3.51)	(-4.81)	(-3.04)	(-3.64)	(-5.09)	(6.87)	(5.52)	(6.71)	(6.60)
	SMB	0.044%	0.031%	0.042%	0.049%	-0.041%	-0.022%	-0.040%	-0.046%*	0.084%*	0.049%	0.078%*	0.089%*
	HML	(1.18)	(1.11)	(1.34)	(1.31)	(-1.95)	(-0.71)	(-1.82)	(-2.28)	(2.21)	(1.42)	(2.41)	(2.39)
	Alpha	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
<i>R</i> ²	0.666	0.664	0.612	0.624	0.765	0.711	0.753	0.770	0.141	0.095	0.034	0.120	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Recommendation Dispersion

	Quantile 1				Quantile 5				Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually
CAPM	Market Risk Beta	1.476*** (45.65)	1.320*** (44.94)	1.811*** (35.45)	1.774*** (34.76)	1.387*** (60.59)	1.231*** (61.64)	1.484*** (50.36)	1.807*** (43.09)	0.089** (3.01)	0.090*** (3.29)	0.328*** (8.42)	-0.033 (-0.91)
	Alpha	-0.018% (-0.77)	-0.024% (-1.18)	0.024% (0.71)	0.026% (0.80)	-0.041%* (-2.11)	-0.043%* (-2.49)	-0.033% (-1.40)	-0.024% (-0.82)	0.019% (0.66)	0.015% (0.55)	0.053% (1.45)	0.046% (1.26)
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
	R ²	0.715	0.724	0.652	0.664	0.758	0.764	0.712	0.701	0.006	0.007	0.049	0.001
Fama-French's three-factor model	Market Risk Beta	1.509*** (41.72)	1.360*** (42.55)	1.842*** (32.65)	1.792*** (32.85)	1.367*** (54.77)	1.218*** (57.28)	1.482*** (44.15)	1.798*** (39.27)	0.142*** (4.28)	0.142*** (4.58)	0.360*** (7.52)	-0.005 (-0.13)
	SMB	0.059 (1.89)	0.070** (2.74)	0.056 (1.43)	0.034 (1.03)	-0.044* (-1.98)	-0.029 (-1.67)	-0.010 (-0.30)	-0.025 (-0.74)	0.104*** (3.78)	0.100*** (3.59)	0.066 (1.44)	0.059* (2.32)
	HML	0.030 (0.88)	0.010 (0.31)	0.044 (0.94)	0.018 (0.39)	-0.158*** (-5.26)	-0.134*** (-5.33)	-0.132*** (-3.95)	-0.168*** (-3.95)	0.188*** (4.51)	0.144*** (3.90)	0.177*** (3.61)	0.186*** (3.97)
	Alpha	-0.017% (-0.72)	-0.023% (-1.12)	0.025% (0.75)	0.026% (0.82)	-0.043%* (-2.23)	-0.044%* (-2.60)	-0.034% (-1.46)	-0.026% (-0.88)	0.023% (0.77)	0.017% (0.66)	0.055% (1.52)	0.048% (1.33)
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
R ²	0.715	0.726	0.653	0.664	0.762	0.768	0.714	0.703	0.018	0.018	0.054	0.007	
Carhart four-factor model	Market Risk Beta	1.511*** (40.95)	1.364*** (41.61)	1.845*** (32.54)	1.795*** (32.91)	1.368*** (54.29)	1.219*** (57.10)	1.483*** (44.20)	1.800*** (39.09)	0.144*** (4.31)	0.145*** (4.60)	0.362*** (7.48)	-0.00515 (-0.13)
	SMB	0.064 (1.90)	0.078** (2.69)	0.062 (1.52)	0.038 (1.16)	-0.042 (-1.84)	-0.028 (-1.55)	-0.007 (-0.23)	-0.020 (-0.60)	0.107*** (3.71)	0.106*** (3.53)	0.070 (1.45)	0.059* (2.30)
	HML	0.050 (1.40)	0.038 (1.21)	0.067 (1.32)	0.035 (0.72)	-0.150*** (-4.76)	-0.128*** (-4.80)	-0.124*** (-3.45)	-0.151*** (-3.34)	0.200*** (4.55)	0.167*** (4.36)	0.190*** (3.66)	0.187*** (3.73)
	MOM	0.048 (1.66)	0.068** (2.66)	0.053 (1.31)	0.041 (1.06)	0.018 (0.66)	0.014 (0.60)	0.021 (0.60)	0.038 (0.98)	0.030 (0.81)	0.054 (1.62)	0.031 (0.67)	0.002 (0.05)
	Alpha	-0.016% (-0.69)	-0.022% (-1.08)	0.026% (0.77)	0.027% (0.84)	-0.043%* (-2.21)	-0.044%* (-2.59)	-0.034% (-1.45)	-0.025% (-0.87)	0.023% (0.78)	0.018% (0.69)	0.056% (1.53)	0.048% (1.34)
N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
R ²	0.716	0.727	0.653	0.664	0.762	0.768	0.714	0.703	0.018	0.019	0.054	0.007	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7. Buy-signal Revision

Quantile 1					Quantile 5					Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
CAPM	Market Risk Beta	2.065*** (30.50)	2.013*** (36.64)	1.663*** (43.35)	1.842*** (48.20)	1.097*** (61.55)	1.174*** (46.95)	1.105*** (44.87)	1.325*** (49.43)	0.968*** (15.49)	0.840*** (17.58)	0.558*** (17.09)	0.518*** (14.51)	
	Alpha	0.045% (1.12)	0.024% (0.64)	-0.023% (-0.89)	-0.023% (-0.87)	-0.046%** (-3.13)	-0.030% (-1.62)	-0.024% (-1.33)	-0.028% (-1.34)	0.087%* (2.04)	0.050% (1.28)	-0.003% (-0.09)	0.002% (0.05)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.623	0.656	0.726	0.755	0.781	0.711	0.697	0.713	0.247	0.227	0.187	0.149	
Fama-French's three-factor model	Market Risk Beta	2.066*** (26.83)	1.973*** (30.74)	1.630*** (35.31)	1.815*** (42.30)	1.100*** (54.62)	1.186*** (43.35)	1.115*** (42.14)	1.339*** (46.02)	0.967*** (13.04)	0.788*** (13.65)	0.516*** (12.50)	0.476*** (11.52)	
	SMB	-0.003 (-0.06)	-0.076 (-1.49)	-0.059 (-1.43)	-0.049 (-1.49)	0.006 (0.33)	0.018 (0.92)	0.016 (0.94)	0.025 (1.29)	-0.009 (-0.14)	-0.094 (-1.94)	-0.075 (-1.87)	-0.074* (-2.50)	
	HML	-0.112 (-1.92)	-0.0984 (-1.86)	-0.0197 (-0.54)	-0.0145 (-0.39)	0.0229 (0.88)	-0.0528* (-2.08)	-0.0255 (-1.09)	-0.00527 (-0.19)	-0.135* (-2.04)	-0.0454 (-0.92)	0.00598 (0.16)	-0.00911 (-0.21)	
	Alpha	0.044% (1.10)	0.027% (0.59)	-0.024% (-0.94)	-0.024% (-0.90)	-0.045%** (-3.13)	-0.030% (-1.63)	-0.024% (-1.32)	-0.028% (-1.32)	0.086%* (2.02)	0.048% (1.23)	-0.004% (-0.13)	0.000% (0.01)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.623	0.657	0.727	0.756	0.781	0.711	0.698	0.714	0.249	0.229	0.190	0.151	
Carhart four-factor model	Market Risk Beta	2.068*** (26.85)	1.975*** (30.74)	1.630*** (35.26)	1.816*** (42.37)	1.101*** (54.82)	1.187*** (42.80)	1.114*** (41.72)	1.342*** (45.38)	0.968*** (13.07)	0.788*** (13.65)	0.516*** (12.44)	0.475*** (11.45)	
	SMB	-0.000 (-0.00)	-0.073 (-1.43)	-0.058 (-1.41)	-0.047 (-1.42)	0.008 (0.43)	0.020 (0.98)	0.016 (0.90)	0.030 (1.47)	-0.007 (-0.12)	-0.093 (-1.92)	-0.074 (-1.81)	-0.076* (-2.56)	
	HML	-0.101 (-1.64)	-0.088 (-1.56)	-0.017 (-0.43)	-0.006 (-0.15)	0.029 (1.10)	-0.046 (-1.72)	-0.027 (-1.08)	0.013 (0.42)	-0.129 (-1.90)	-0.042 (-0.79)	0.010 (0.26)	-0.019 (-0.43)	
	MOM	0.028 (0.55)	0.025 (0.54)	0.006 (0.17)	0.012 (0.56)	0.015 (0.76)	0.017 (0.70)	-0.004 (-0.18)	0.043 (1.48)	0.013 (0.25)	0.008 (0.17)	0.010 (0.28)	-0.023 (-0.57)	
	Alpha	0.045% (1.11)	0.022% (0.60)	-0.024% (-0.93)	-0.023% (-0.89)	-0.045%** (-3.12)	-0.030% (-1.61)	-0.024% (-1.32)	-0.027% (-1.30)	0.086%* (2.02)	0.048% (1.23)	-0.004% (-0.12)	-0.000% (-0.00)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.623	0.657	0.727	0.756	0.781	0.711	0.698	0.714	0.249	0.229	0.190	0.151	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9. Combination

Quantile 1					Quantile 5					Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
CAPM	Market Risk Beta	1.753*** (37.96)	1.574*** (38.81)	1.549*** (40.93)	1.625*** (37.21)	1.240*** (53.43)	1.551*** (44.58)	1.426*** (47.62)	2.144*** (45.45)	0.513*** (10.51)	0.0227 (0.72)	0.124*** (4.00)	-0.519*** (-17.24)	
	Alpha	0.019% (0.62)	0.006% (0.20)	0.006% (0.23)	0.023% (0.81)	-0.061%*** (-3.73)	-0.025% (-1.07)	-0.026% (-1.24)	-0.003% (-0.10)	0.075%* (2.13)	0.026% (0.84)	0.028% (0.95)	0.022% (0.68)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.682	0.680	0.701	0.682	0.787	0.741	0.743	0.749	0.118	0.000	0.011	0.139	
Fama-French's three-factor model	Market Risk Beta	1.772*** (35.16)	1.584*** (35.16)	1.561*** (37.63)	1.640*** (34.49)	1.225*** (49.53)	1.531*** (39.72)	1.424*** (44.26)	2.091*** (35.02)	0.547*** (10.17)	0.0538 (1.49)	0.138*** (3.89)	-0.450*** (-10.64)	
	SMB	0.032 (1.00)	0.018 (0.64)	0.023 (0.89)	0.030 (1.09)	-0.027 (-1.59)	-0.042 (-1.29)	-0.007 (-0.29)	-0.104 (-1.75)	0.059* (2.08)	0.060* (2.19)	0.030 (1.19)	0.134* (2.57)	
	HML	-0.036 (-0.88)	0.000 (0.00)	0.052 (1.49)	0.051 (1.35)	-0.008 (-0.34)	-0.107** (-3.08)	-0.057 (-1.93)	-0.205*** (-4.17)	-0.028 (-0.60)	0.107** (2.61)	0.109** (2.68)	0.256*** (5.28)	
	Alpha	0.019% (0.63)	0.006% (0.21)	0.007% (0.26)	0.024% (0.84)	-0.061%*** (-3.79)	-0.026% (-1.14)	-0.027% (-1.27)	-0.006% (-0.21)	0.076%* (2.16)	0.028% (0.90)	0.030% (1.00)	0.026% (0.81)	
Carhart four-factor model	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.683	0.680	0.701	0.682	0.787	0.743	0.744	0.752	0.120	0.004	0.014	0.155	
	Market Risk Beta	1.779*** (34.92)	1.591*** (34.74)	1.567*** (37.42)	1.647*** (34.51)	1.223*** (49.24)	1.528*** (40.06)	1.419*** (44.46)	2.084*** (35.17)	0.556*** (10.22)	0.0629 (1.75)	0.148*** (4.16)	-0.437*** (-10.54)	
	SMB	0.045 (1.30)	0.030 (0.97)	0.035 (1.26)	0.0430 (1.48)	-0.031 (-1.87)	-0.047 (-1.50)	-0.015 (-0.68)	-0.116* (-2.01)	0.076* (2.39)	0.078** (2.83)	0.050 (1.89)	0.159*** (3.08)	
Carhart four-factor model	HML	0.014 (0.31)	0.049 (1.16)	0.099* (2.52)	0.100* (2.31)	-0.024 (-0.95)	-0.124*** (-3.38)	-0.087** (-2.77)	-0.252*** (-5.00)	0.038 (0.76)	0.173*** (3.86)	0.187*** (4.20)	0.353*** (6.91)	
	MOM	0.118** (3.27)	0.114** (3.22)	0.111*** (3.35)	0.117** (3.23)	-0.037 (-1.70)	-0.041 (-1.24)	-0.072* (-2.46)	-0.112* (-2.56)	0.155*** (3.79)	0.155*** (3.96)	0.183*** (4.73)	0.228*** (5.15)	
	Alpha	0.020% (0.68)	0.007% (0.27)	0.008% (0.32)	0.025% (0.90)	-0.062%*** (-3.82)	-0.027% (-1.16)	-0.028% (-1.32)	-0.008% (-0.25)	0.078* (2.22)	0.030% (0.97)	0.032% (1.09)	0.029% (0.91)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
R ²	0.684	0.681	0.703	0.684	0.787	0.743	0.745	0.753	0.125	0.011	0.026	0.168		

t statistics in parentheses* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10. Buy-signal Revision – three months back in time

Quantile 1					Quantile 5				Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	
CAPM	Market Risk	1.410*** (41.18)	1.500*** (40.59)	1.190*** (54.58)	1.158*** (49.85)	1.128*** (44.86)	1.199*** (37.47)	1.265*** (36.93)	1.823*** (44.46)	0.282*** (9.12)	0.301*** (8.86)	-0.0745** (-2.77)	-0.665*** (-19.72)
	Alpha	-0.011% (-0.46)	-0.014% (-0.58)	-0.036%* (-2.31)	-0.038%* (-2.39)	-0.035% (-1.91)	-0.028% (-1.29)	-0.016% (-0.69)	0.016% (0.52)	0.020% (0.73)	0.011% (0.36)	-0.024% (-0.94)	-0.058% (-1.78)
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
	R ²	0.695	0.721	0.790	0.770	0.713	0.660	0.663	0.680	0.063	0.063	0.006	0.206
Fama-French's three-factor model	Market Risk	1.416*** (34.40)	1.498*** (35.61)	1.183*** (46.38)	1.163*** (45.54)	1.132*** (38.99)	1.213*** (33.45)	1.264*** (33.62)	1.833*** (38.93)	0.285*** (6.97)	0.285*** (7.16)	-0.0808** (-2.70)	-0.669*** (-16.26)
	SMB	0.008 (0.21)	-0.007 (-0.22)	-0.015 (-0.77)	0.008 (0.47)	0.006 (0.30)	0.023 (0.90)	-0.006 (-0.25)	0.014 (0.36)	0.002 (0.04)	-0.029 (-0.97)	-0.008 (-0.40)	-0.006 (-0.16)
	HML	-0.056 (-1.56)	-0.053 (-1.53)	-0.027 (-1.27)	-0.028 (-1.29)	0.011 (0.44)	-0.019 (-0.61)	-0.078* (-2.39)	-0.063 (-1.49)	-0.067 (-1.58)	-0.034 (-0.87)	0.051 (1.49)	0.035 (0.86)
	Alpha	-0.011% (-0.47)	-0.014% (-0.60)	-0.036%* (-2.34)	-0.038%* (-2.40)	-0.034% (-1.91)	-0.028% (-1.29)	-0.016% (-0.72)	0.016% (0.51)	0.012% (0.72)	0.010% (0.34)	-0.024% (-0.94)	-0.058% (-1.78)
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
Carhart four-factor model	R ²	0.696	0.721	0.790	0.771	0.713	0.661	0.663	0.680	0.065	0.063	0.007	0.207
	Market Risk	1.419*** (33.91)	1.502*** (35.40)	1.186*** (46.15)	1.166*** (45.26)	1.132*** (38.67)	1.214*** (33.28)	1.264*** (33.53)	1.837*** (38.66)	0.288*** (6.85)	0.288*** (7.21)	-0.0781** (-2.61)	-0.670*** (-16.13)
	SMB	0.013 (0.32)	0.001 (0.03)	-0.009 (-0.42)	0.013 (0.75)	0.007 (0.30)	0.025 (0.95)	-0.005 (-0.20)	0.021 (0.54)	0.007 (0.14)	-0.024 (-0.77)	-0.003 (-0.16)	-0.008 (-0.21)
	HML	-0.036 (-0.97)	-0.023 (-0.64)	-0.003 (-0.11)	-0.006 (-0.24)	0.011 (0.40)	-0.011 (-0.32)	-0.073* (-2.06)	-0.034 (-0.70)	-0.047 (-1.09)	-0.013 (-0.31)	0.071 (1.92)	0.028 (0.62)
	MOM	0.046 (1.36)	0.067* (2.14)	0.057** (2.68)	0.052* (2.56)	0.000 (0.02)	0.020 (0.73)	0.011 (0.38)	0.069 (1.62)	0.046 (1.27)	0.050 (1.43)	0.046 (1.61)	-0.017 (-0.42)
Alpha		-0.010% (-0.45)	-0.013% (-0.57)	-0.035%* (-2.29)	-0.038%* (-2.36)	-0.034% (-1.91)	-0.028% (-1.28)	-0.016% (-0.71)	0.017% (0.54)	0.020% (0.74)	0.011% (0.36)	-0.023% (-0.92)	-0.058% (-1.78)
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
	R ²	0.696	0.722	0.791	0.771	0.713	0.661	0.664	0.680	0.066	0.064	0.008	0.207

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11. Buy-signal Revision – six months back in time

	Quantile 1					Quantile 5					Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
CAPM	Market Risk	1.646*** (43.83)	1.452*** (47.07)	1.607*** (42.83)	1.606*** (42.01)	1.547*** (51.16)	1.789*** (41.69)	1.788*** (40.91)	1.970*** (40.27)	0.0988** (3.16)	-0.337*** (-10.40)	-0.181*** (-5.90)	-0.364*** (-12.16)		
	Alpha	-0.006% (-0.23)	-0.023% (-1.15)	-0.008% (-0.33)	-0.006% (-0.26)	-0.026% (-1.17)	-0.005% (-0.17)	0.006% (0.17)	0.030% (0.83)	0.017% (0.56)	-0.022% (-0.68)	-0.017% (-0.52)	-0.040% (-1.14)		
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947		
	R ²	0.728	0.765	0.749	0.739	0.750	0.686	0.662	0.645	0.007	0.065	0.019	0.062		
	Market Risk	1.643*** (36.98)	1.446*** (41.02)	1.605*** (37.89)	1.602*** (38.76)	1.522*** (42.50)	1.769*** (36.32)	1.769*** (35.86)	1.963*** (34.58)	0.121** (3.12)	-0.323*** (-9.09)	-0.163*** (-4.87)	-0.360*** (-10.50)		
Fama-French's three-factor model	SMB	-0.009 (-0.22)	-0.013 (-0.46)	-0.008 (-0.26)	-0.010 (-0.33)	-0.043 (-1.29)	-0.040 (-1.06)	-0.038 (-1.00)	-0.015 (-0.32)	0.034 (0.81)	0.027 (1.11)	0.030 (1.32)	0.006 (0.17)		
	HML	-0.054 (-1.36)	-0.042 (-1.38)	-0.080* (-2.13)	-0.064 (-1.78)	0.028 (0.84)	-0.103* (-2.47)	-0.080 (-1.94)	-0.033 (-0.69)	-0.082 (-1.75)	0.062 (1.51)	0.000 (0.00)	-0.030 (-0.71)		
	Alpha	-0.006% (-0.25)	-0.024% (-1.18)	-0.008% (-0.36)	-0.007% (-0.28)	-0.027% (-1.20)	-0.007% (-0.22)	0.004% (0.14)	0.030% (0.81)	0.017% (0.56)	-0.021% (-0.65)	-0.017% (-0.51)	-0.040% (-1.14)		
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947		
	R ²	0.728	0.765	0.750	0.739	0.750	0.687	0.663	0.645	0.010	0.066	0.019	0.063		
Carhart four-factor model	Market Risk	1.642*** (37.01)	1.446*** (40.95)	1.606*** (37.81)	1.606*** (38.76)	1.518*** (41.89)	1.767*** (36.55)	1.767*** (36.04)	1.958*** (34.58)	0.124** (3.12)	-0.321*** (-9.07)	-0.161*** (-4.80)	-0.352*** (-10.25)		
	SMB	-0.009 (-0.24)	-0.012 (-0.47)	-0.006 (-0.19)	-0.003 (-0.11)	-0.050 (-1.44)	-0.044 (-1.21)	-0.041 (-1.11)	-0.024 (-0.52)	0.041 (0.89)	0.032 (1.29)	0.031 (1.53)	0.021 (0.59)		
	HML	-0.056 (-1.29)	-0.041 (-1.23)	-0.072 (-1.78)	-0.039 (-0.99)	0.002 (0.04)	-0.119** (-2.70)	-0.091* (-2.05)	-0.068 (-1.35)	-0.057 (-1.19)	0.078 (1.85)	0.019 (0.47)	0.029 (0.69)		
	MOM	-0.005 (-0.14)	0.001 (0.04)	0.019 (0.58)	0.058 (1.73)	-0.063* (-2.04)	-0.037 (-0.94)	-0.027 (-0.68)	-0.083 (-1.92)	0.059 (1.42)	0.038 (0.94)	0.046 (1.17)	0.140*** (3.39)		
	Alpha	-0.006% (-0.25)	-0.024% (-1.17)	-0.008% (-0.35)	-0.006% (-0.25)	-0.028% (-1.24)	-0.007% (-0.24)	0.004% (0.12)	0.029% (0.78)	0.017% (0.58)	-0.020% (-0.64)	-0.016% (-0.49)	-0.039% (-1.10)		
N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947		
R ²	0.728	0.765	0.750	0.740	0.751	0.687	0.663	0.646	0.011	0.066	0.019	0.067	0.067		

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 13. Combination – three months back in time

	Quantile 1					Quantile 5					Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
CAPM	Market Risk Beta	1.950*** (32.74)	1.726*** (36.17)	1.518*** (37.93)	1.391*** (48.25)	1.015*** (51.12)	1.233*** (47.28)	1.988*** (33.69)	2.136*** (37.48)	0.936*** (17.31)	0.493*** (12.03)	-0.470*** (-13.11)	-0.745*** (-17.24)		
	Alpha	0.049% (1.29)	0.031% (0.97)	0.018% (0.69)	-0.004% (-0.19)	-0.044%*** (-3.02)	-0.037%* (-2.12)	0.008% (0.22)	0.009% (0.27)	0.089%* (2.21)	0.064% (1.84)	0.007% (0.20)	-0.017% (-0.49)		
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947		
	R ²	0.628	0.649	0.670	0.742	0.754	0.758	0.672	0.700	0.256	0.113	0.109	0.219		
Fama-French's three-factor model	Market Risk Beta	1.983*** (30.31)	1.754*** (33.39)	1.537*** (35.49)	1.406*** (45.25)	1.000*** (45.44)	1.204*** (40.21)	1.933*** (28.38)	2.079*** (29.78)	0.983*** (16.20)	0.551*** (11.92)	-0.396*** (-8.70)	-0.673*** (-11.94)		
	SMB	0.053 (1.20)	0.048 (1.33)	0.033 (1.18)	0.027 (1.19)	-0.028 (-1.81)	-0.055* (-2.25)	-0.107 (-1.90)	-0.106 (-1.63)	0.081 (1.94)	0.103*** (2.86)	0.140*** (2.74)	0.134* (2.12)		
	HML	-0.099 (-1.89)	-0.033 (-0.72)	0.001 (0.03)	0.010 (0.32)	-0.058** (-2.61)	-0.081** (-3.05)	-0.198*** (-3.63)	-0.134* (-2.36)	-0.040 (-0.72)	0.049 (0.98)	0.200*** (3.64)	0.144* (2.51)		
	Alpha	0.049% (1.30)	0.031% (0.99)	0.019% (0.71)	-0.003% (-0.17)	-0.045%*** (-3.10)	-0.039%* (-2.22)	0.005% (0.13)	0.007% (0.19)	0.090%* (2.24)	0.066% (1.90)	0.010% (0.32)	-0.014% (-0.40)		
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947		
Carhart four-factor model	Market Risk Beta	1.992*** (29.92)	1.762*** (33.01)	1.544*** (35.30)	1.411*** (45.08)	0.997*** (44.70)	1.198*** (40.72)	1.926*** (28.64)	2.073*** (29.72)	0.995*** (15.89)	0.565*** (11.98)	-0.381*** (-8.65)	-0.662*** (-11.72)		
	SMB	0.069 (1.41)	0.063 (1.54)	0.047 (1.51)	0.037 (1.48)	-0.035* (-2.13)	-0.067** (-2.99)	-0.121* (-2.26)	-0.117 (-1.80)	0.104* (2.09)	0.130*** (3.12)	0.168*** (3.35)	0.154* (2.37)		
	HML	-0.036 (-0.62)	0.023 (0.45)	0.052 (1.21)	0.045 (1.27)	-0.083*** (-3.45)	-0.126*** (-4.69)	-0.252*** (-4.57)	-0.177*** (-3.13)	0.0472 (0.76)	0.149*** (2.78)	0.304*** (5.60)	0.221*** (3.95)		
	MOM	0.147** (3.14)	0.131** (3.16)	0.120*** (3.47)	0.083** (2.95)	-0.059*** (-2.83)	-0.107*** (-4.18)	-0.126** (-2.61)	-0.101* (-2.10)	0.206*** (4.26)	0.238*** (5.36)	0.246*** (5.30)	0.183*** (3.80)		
	Alpha	0.051% (1.35)	0.033% (1.04)	0.021% (0.77)	-0.002% (-0.12)	-0.046%*** (-3.16)	-0.040%* (-2.31)	0.003% (0.08)	0.005% (0.15)	0.092%* (2.32)	0.069%* (2.01)	0.014% (0.41)	-0.012% (-0.33)		
N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947		
	R ²	0.631	0.651	0.673	0.743	0.757	0.762	0.676	0.703	0.264	0.128	0.134	0.231		

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15. Combination – twelve months back in time

Quantile 1					Quantile 5					Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
CAPM	Market Risk	1.561*** (30.53)	1.356*** (46.46)	1.748*** (32.35)	1.968*** (30.19)	1.472*** (42.79)	1.919*** (43.49)	2.065*** (35.61)	2.082*** (39.40)	0.0884** (2.70)	-0.563*** (-18.57)	-0.317*** (-9.87)	-0.114*** (-3.44)	
	Alpha	0.032% (1.02)	-0.005% (-0.23)	0.029% (0.87)	0.037% (1.01)	-0.027% (-1.19)	-0.006% (-0.21)	-0.001% (-0.02)	-0.002% (-0.07)	0.054% (1.74)	-0.003% (-0.09)	0.026% (0.70)	0.036% (1.00)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.622	0.722	0.642	0.644	0.731	0.732	0.664	0.697	0.005	0.181	0.045	0.006	
Fama-French's three-factor model	Market Risk	1.578*** (28.10)	1.374*** (42.48)	1.764*** (30.01)	1.967*** (27.56)	1.442*** (37.00)	1.880*** (35.68)	2.019*** (29.99)	2.022*** (31.30)	0.137*** (3.78)	-0.506*** (-12.75)	-0.255*** (-6.08)	-0.055 (-1.38)	
	SMB	0.030 (0.97)	0.031 (1.42)	0.028 (0.98)	-0.003 (-0.07)	-0.057 (-1.90)	-0.075 (-1.63)	-0.088 (-1.51)	-0.109 (-1.81)	0.087*** (3.44)	0.106* (2.45)	0.116* (2.32)	0.107*** (2.62)	
	HML	-0.032 (-0.76)	0.002 (0.07)	0.016 (0.36)	-0.029 (-0.55)	-0.071* (-2.17)	-0.112* (-2.52)	-0.123* (-2.17)	-0.072 (-1.30)	0.039 (0.89)	0.114* (2.53)	0.138** (2.68)	0.043 (0.85)	
	Alpha	0.032% (1.03)	-0.004% (-0.21)	0.029% (0.89)	0.037% (1.00)	-0.028% (-1.26)	-0.008% (-0.28)	-0.003% (-0.09)	-0.005% (-0.14)	0.056% (1.80)	-0.000% (-0.00)	0.029% (0.78)	0.038% (1.06)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.622	0.723	0.642	0.644	0.732	0.734	0.665	0.698	0.008	0.187	0.051	0.010	
Carhart four-factor model	Market Risk	1.586*** (27.97)	1.378*** (42.33)	1.772*** (30.12)	1.976*** (27.62)	1.435*** (37.19)	1.872*** (35.81)	2.012*** (30.00)	2.015*** (31.24)	0.152*** (4.07)	-0.493*** (-12.52)	-0.240*** (-5.87)	-0.038 (-0.97)	
	SMB	0.044 (1.28)	0.039 (1.68)	0.043 (1.49)	0.013 (0.34)	-0.071* (-2.43)	-0.090* (-2.00)	-0.100 (-1.74)	-0.124* (-2.05)	0.115*** (3.56)	0.129** (2.88)	0.143** (2.95)	0.137*** (3.20)	
	HML	0.023 (0.52)	0.032 (0.92)	0.075 (1.57)	0.033 (0.57)	-0.123*** (-3.68)	-0.169*** (-3.80)	-0.170** (-2.97)	-0.127* (-2.36)	0.146*** (3.36)	0.201*** (4.54)	0.245*** (4.66)	0.160*** (3.18)	
	MOM	0.130*** (3.56)	0.071* (2.47)	0.140*** (3.48)	0.146** (3.19)	-0.124*** (-4.22)	-0.136*** (-3.47)	-0.111* (-2.42)	-0.129** (-2.91)	0.254*** (6.91)	0.206*** (5.36)	0.251*** (5.48)	0.275*** (6.23)	
	Alpha	0.033% (1.09)	-0.004% (-0.17)	0.031% (0.95)	0.039% (1.05)	-0.030% (-1.34)	-0.010% (-0.34)	-0.005% (-0.13)	-0.007% (-0.19)	0.059% (1.92)	0.003% (0.09)	0.032% (0.88)	0.042 (1.17)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.624	0.724	0.644	0.646	0.734	0.736	0.666	0.700	0.028	0.198	0.064	0.027	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16. Target Price Dispersion: Sub-periods under the CAPM

	Quantile 1					Quantile 5					Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually			
2005-2009	Market Risk	1.578***	1.208***	1.087***	1.330***	1.298***	1.277***	1.219***	1.243***	0.281***	-0.0690	-0.131**	0.0874		
	Beta	(47.71)	(40.30)	(44.28)	(37.63)	(26.59)	(27.24)	(26.46)	(25.67)	(5.18)	(-1.49)	(-3.03)	(1.93)		
	Alpha	0.018%	-0.012%	-0.015%	0.004%	-0.032%	-0.033%	-0.015%	-0.021%	0.050%	0.014%	-0.007%	0.016%		
		(0.46)	(-0.36)	(-0.56)	(0.09)	(-0.79)	(-0.86)	(-0.40)	(-0.52)	(0.86)	(0.27)	(-0.16)	(0.31)		
	N	984	984	984	984	984	984	984	984	984	984	984	984		
R ²	0.801	0.783	0.807	0.756	0.724	0.736	0.716	0.717	0.056	0.005	0.020	0.007			
2009-2013	Market Risk	1.604***	1.175***	1.150***	1.475***	1.433***	2.070***	1.510***	1.372***	0.171***	-0.895***	-0.359***	0.104**		
	Beta	(45.11)	(46.33)	(44.88)	(43.23)	(47.17)	(40.75)	(41.09)	(49.46)	(4.77)	(-17.12)	(-8.66)	(2.80)		
	Alpha	-0.009%	-0.015%	0.013%	0.009%	-0.030%	0.004%	-0.041%	-0.047%	0.022%	-0.023%	0.051%	0.053%		
		(-0.26)	(-0.62)	(0.53)	(0.28)	(-1.04)	(0.09)	(-1.24)	(-1.69)	(0.51)	(-0.45)	(1.24)	(1.30)		
	Observations	989	989	989	989	989	989	989	989	989	989	989	989		
R ²	0.818	0.815	0.806	0.814	0.821	0.806	0.803	0.823	0.031	0.384	0.130	0.012			
2013-2017	Market Risk	4.123***	3.089***	3.487***	4.173***	2.141***	3.212***	2.240***	1.955***	1.982***	-0.123	1.247***	2.218***		
	Beta	(47.33)	(56.17)	(59.96)	(61.01)	(58.54)	(46.71)	(57.73)	(57.01)	(20.92)	(-1.47)	(19.22)	(29.98)		
	Alpha	0.034%	0.056%	0.044%	0.033%	-0.077%*	-0.108%*	-0.092%**	-0.080%**	0.111%	0.163%*	0.135%*	0.112%		
		(0.54)	(1.20)	(0.85)	(0.56)	(-2.45)	(-2.21)	(-2.92)	(-2.85)	(1.50)	(2.28)	(2.18)	(1.67)		
	N	974	974	974	974	974	974	974	974	974	974	974	974		
R ²	0.820	0.823	0.831	0.843	0.833	0.828	0.844	0.839	0.434	0.003	0.304	0.537			

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17a. Target Price Dispersion: Sub-periods under the Carhart four-factor model

	Quantile 1					Quantile 5					Long-short			
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
Market Risk	1.599***	1.224***	1.101***	1.358***	1.262***	1.239***	1.182***	1.203***	0.337***	-0.0149	-0.0805	0.155**		
Beta	(45.68)	(38.23)	(43.93)	(38.95)	(25.91)	(26.34)	(25.83)	(24.48)	(5.80)	(-0.29)	(-1.74)	(3.03)		
SMB	0.047	0.032	0.029	0.063*	-0.089*	-0.092*	-0.093**	-0.099**	0.135*	0.124*	0.122**	0.162**		
	(1.33)	(0.88)	(1.17)	(2.08)	(-2.49)	(-2.52)	(-2.80)	(-2.62)	(2.39)	(2.14)	(2.86)	(3.16)		
HML	0.116	0.012	0.036	0.077	-0.379***	-0.354***	-0.403***	-0.399***	0.495***	0.367***	0.440***	0.476***		
	(1.87)	(0.26)	(0.91)	(1.35)	(-5.98)	(-5.64)	(-6.22)	(-6.05)	(5.18)	(4.43)	(5.33)	(5.05)		
MOM	0.104*	0.079*	0.058	0.018	-0.368***	-0.398***	-0.339***	-0.327***	0.472***	0.477***	0.397***	0.345***		
	(2.10)	(2.03)	(1.75)	(0.37)	(-6.06)	(-6.91)	(-6.00)	(-5.95)	(5.86)	(6.83)	(5.90)	(4.68)		
Alpha	0.021%	-0.013%	-0.014%	0.011%	-0.033%	-0.032%	-0.019%	-0.025%	0.054%	0.012%	-0.003%	0.028%		
	(0.52)	(-0.39)	(-0.53)	(0.29)	(-0.86)	(-0.88)	(-0.52)	(-0.68)	(0.96)	(0.24)	(-0.07)	(0.57)		
N	984	984	984	984	984	984	984	984	984	984	984	984		
R ²	0.803	0.785	0.808	0.757	0.747	0.762	0.740	0.740	0.120	0.089	0.096	0.069		
Market Risk	1.694***	1.245***	1.226***	1.589***	1.412***	2.067***	1.506***	1.341***	0.282***	-0.821***	-0.280***	0.248***		
Beta	(33.86)	(30.98)	(32.82)	(32.85)	(31.28)	(27.42)	(27.40)	(30.78)	(5.85)	(-10.34)	(-4.64)	(5.18)		
SMB	0.125*	0.100*	0.105*	0.160**	-0.039	-0.022	-0.014	-0.047	0.164***	0.122	0.119*	0.207***		
	(2.26)	(2.26)	(2.43)	(2.78)	(-0.61)	(-0.22)	(-0.20)	(-0.81)	(3.41)	(1.44)	(1.98)	(4.41)		
HML	0.004	0.036	0.006	0.014	-0.155***	-0.232***	-0.151**	-0.102*	0.159**	0.268***	0.158**	0.115*		
	(0.10)	(1.15)	(0.21)	(0.33)	(-3.77)	(-3.66)	(-2.97)	(-2.53)	(3.16)	(3.99)	(2.80)	(2.49)		
MOM	0.138***	0.095**	0.128***	0.144***	-0.068	0.014	-0.050	-0.103*	0.206***	0.0813	0.177**	0.247***		
	(3.75)	(3.20)	(4.38)	(3.65)	(-1.55)	(0.20)	(-0.96)	(-2.35)	(4.04)	(1.19)	(3.28)	(5.32)		
Alpha	-0.001%	-0.011%	0.020%	0.018%	-0.030%	0.010%	-0.039%	-0.050%	0.029%	-0.023%	0.056%	0.064%		
	(-0.02)	(-0.43)	(0.82)	(0.57)	(-1.03)	(0.22)	(-1.19)	(-1.78)	(0.70)	(-0.47)	(1.40)	(1.61)		
N	989	989	989	989	989	989	989	989	989	989	989	989		
R ²	0.823	0.820	0.813	0.822	0.826	0.811	0.806	0.826	0.061	0.399	0.152	0.060		

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17b. Target Price Dispersion: Sub-periods under the Carhart four-factor model

	Quantile 1					Quantile 5					Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
Market Risk		4.156***	3.094***	3.508***	4.176***	2.073***	3.152***	2.195***	1.910***	2.083***	-0.059	1.312***	2.266***		
Beta		(45.47)	(53.46)	(60.26)	(59.23)	(43.14)	(37.60)	(38.20)	(36.58)	(20.10)	(-0.59)	(17.59)	(29.51)		
SMB		0.076	0.016	0.057	0.023	-0.128*	-0.114	-0.081	-0.086	0.204**	0.129	0.138	0.109		
		(1.70)	(0.43)	(1.57)	(0.45)	(-2.25)	(-1.34)	(-1.09)	(-1.23)	(2.67)	(1.29)	(1.76)	(1.81)		
HML		0.133	0.226**	0.225*	0.267*	-0.0473	-0.099	-0.120*	-0.067	0.180	0.324*	0.346***	0.334**		
		(1.20)	(2.70)	(2.51)	(2.54)	(-0.81)	(-1.13)	(-2.09)	(-1.26)	(1.37)	(2.57)	(3.31)	(2.75)		
MOM		0.276**	0.126	0.346***	0.313**	-0.094*	-0.095	-0.010	-0.080*	0.370***	0.221*	0.356***	0.392***		
		(3.14)	(1.78)	(4.05)	(3.25)	(-2.04)	(-1.38)	(-0.22)	(-2.04)	(3.43)	(2.16)	(3.67)	(3.55)		
Alpha		0.041%	0.063%	0.056%	0.047%	-0.073%*	-0.105%*	-0.088%**	-0.078%**	0.114%	0.166%*	0.143%*	0.124%		
		(0.65)	(1.34)	(1.11)	(0.81)	(-2.30)	(-2.13)	(-2.79)	(-2.79)	(1.53)	(2.32)	(2.35)	(1.87)		
N		974	974	974	974	974	974	974	974	974	974	974	974		
R ²		0.822	0.825	0.836	0.846	0.836	0.829	0.846	0.841	0.444	0.017	0.324	0.550		

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18. Recommendations Dispersion: Sub-periods under the CAPM

Quantile 1						Quantile 5				Long-short			
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually		Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually
2005-2009	Market Risk	1.179*** (35.40)	1.100*** (37.11)	1.210*** (48.14)	1.110*** (44.71)	1.353*** (33.02)	1.182*** (33.91)	1.330*** (29.61)	1.428*** (25.76)	-0.174*** (-4.50)	-0.0819*** (-2.68)	-0.121*** (-3.08)	-0.318*** (-6.04)
	Alpha	-0.028% (-0.85)	-0.039% (-1.30)	-0.024% (-0.84)	-0.020% (-0.64)	-0.007% (-0.15)	-0.020% (-0.79)	-0.026% (-0.55)	-0.001% (-0.02)	-0.029% (-0.58)	-0.017% (-0.39)	-0.006% (-0.10)	-0.026% (-0.42)
	N	984	984	984	984	984	984	984	984	984	984	984	984
	R ²	0.764	0.779	0.825	0.774	0.719	0.724	0.669	0.632	0.029	0.009	0.013	0.063
2009-2013	Market Risk	1.264*** (50.25)	1.083*** (45.74)	1.550*** (46.03)	1.623*** (45.37)	1.293*** (51.78)	1.230*** (51.80)	1.352*** (50.46)	1.800*** (47.38)	-0.0290 (-0.86)	-0.147*** (-4.56)	0.198*** (5.55)	-0.177*** (-4.33)
	Alpha	-0.006% (-0.22)	-0.004% (-0.17)	0.029% (0.83)	0.021% (0.58)	-0.060%* (-2.31)	-0.048% (-1.90)	-0.019% (-0.70)	-0.033% (-0.88)	0.051% (1.33)	0.041% (1.16)	0.045% (1.09)	0.050% (1.01)
	Observations	989	989	989	989	989	989	989	989	989	989	989	989
	R ²	0.810	0.799	0.799	0.803	0.828	0.824	0.822	0.821	0.001	0.033	0.043	0.024
2013-2017	Market Risk	2.601*** (58.90)	2.305*** (61.27)	3.772*** (58.37)	3.677*** (67.01)	1.652*** (53.28)	1.351*** (41.08)	2.107*** (49.26)	2.746*** (59.42)	0.949*** (15.42)	0.954*** (17.13)	1.666*** (20.07)	0.932*** (12.16)
	Alpha	-0.067% (-1.77)	-0.067%* (-2.07)	-0.024% (-0.45)	-0.021% (-0.50)	-0.065%* (-2.22)	-0.058%* (-2.31)	-0.078%* (-2.05)	-0.093%* (-2.02)	-0.003% (-0.06)	-0.010% (-0.22)	0.053% (0.76)	0.071% (1.09)
	N	974	974	974	974	974	974	974	974	974	974	974	974
	R ²	0.837	0.848	0.847	0.891	0.776	0.764	0.762	0.793	0.261	0.329	0.378	0.183

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 19a. Recommendations Dispersion: Sub-periods under the Carhart four-factor model

Quantile 1						Quantile 5				Long-short			
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually
2005-2009	Market Risk	1.205***	1.135***	1.238***	1.150***	1.328***	1.172***	1.346***	1.448***	-0.123**	-0.0370	-0.108*	-0.298***
	Beta	(32.69)	(34.89)	(50.22)	(47.18)	(33.96)	(35.01)	(28.47)	(25.56)	(-2.83)	(-1.00)	(-2.16)	(-5.23)
	SMB	0.058	0.077	0.068*	0.090***	-0.062*	-0.027	0.031	0.042	0.120*	0.104*	0.037	0.049
		(1.17)	(1.74)	(2.27)	(3.74)	(-2.04)	(-1.06)	(0.64)	(0.99)	(2.33)	(2.11)	(0.56)	(1.11)
	HML	0.113*	0.126**	0.180***	0.174***	-0.136*	-0.080	0.017	0.044	0.250**	0.206**	0.163*	0.130
		(2.04)	(2.71)	(3.98)	(4.00)	(-2.14)	(-1.46)	(0.26)	(0.61)	(2.95)	(3.10)	(2.13)	(1.60)
	MOM	0.096*	0.123***	0.076*	0.117**	0.078	0.094	0.140*	0.136*	0.018	0.029	-0.064	-0.019
		(2.28)	(3.43)	(2.31)	(3.29)	(1.37)	(1.95)	(2.27)	(1.99)	(0.26)	(0.52)	(-0.96)	(-0.25)
	Alpha	-0.024%	-0.034%	-0.016%	-0.012%	-0.021%	-0.040%	-0.030%	-0.003%	-0.011%	-0.002%	0.007%	-0.016%
		(-0.73)	(-1.16)	(-0.56)	(-0.39)	(-0.50)	(-1.09)	(-0.65)	(-0.06)	(-0.22)	(-0.05)	(0.13)	(-0.26)
N	984	984	984	984	984	984	984	984	984	984	984	984	
R ²	0.766	0.784	0.829	0.781	0.723	0.728	0.672	0.634	0.634	0.046	0.024	0.024	0.067
2009-2013	Market Risk	1.281***	1.107***	1.578***	1.647***	1.303***	1.246***	1.390***	1.875***	-0.0213	-0.139***	0.188***	-0.227***
	Beta	(29.07)	(29.96)	(31.14)	(31.69)	(34.93)	(36.44)	(35.77)	(35.73)	(-0.49)	(-3.33)	(3.96)	(-4.42)
	SMB	0.025	0.033	0.040	0.037	0.006	0.015	0.050	0.097	0.020	0.018	-0.008	-0.061
		(0.50)	(0.78)	(0.65)	(0.56)	(0.12)	(0.35)	(0.99)	(1.57)	(0.41)	(0.41)	(-0.15)	(-1.05)
	HML	-0.026	-0.044	-0.044	-0.039	-0.123**	-0.110**	-0.103*	-0.127*	0.097	0.067	0.060	0.089
		(-0.84)	(-1.41)	(-1.00)	(-0.82)	(-2.93)	(-2.87)	(-2.36)	(-2.24)	(1.93)	(1.45)	(1.10)	(1.44)
	MOM	-0.040	-0.035	-0.046	-0.094*	-0.001	-0.002	-0.002	0.050	-0.039	-0.033	-0.045	-0.144*
		(-1.16)	(-1.12)	(-1.10)	(-2.18)	(-0.03)	(-0.06)	(-0.04)	(0.93)	(-0.78)	(-0.71)	(-0.80)	(-2.18)
	Alpha	-0.006%	-0.004%	0.029%	0.019%	-0.057%*	-0.045%	-0.016%	-0.025%	0.047%	0.038%	0.047%	0.041%
		(-0.23)	(-0.16)	(0.83)	(0.52)	(-2.21)	(-1.80)	(-0.58)	(-0.69)	(1.25)	(1.09)	(1.01)	(0.83)
N	989	989	989	989	989	989	989	989	989	989	989	989	
R ²	0.811	0.801	0.800	0.805	0.832	0.827	0.825	0.825	0.825	0.010	0.039	0.047	0.042

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 19b. Recommendations Dispersion: Sub-periods under the Carhart four-factor model

	Quantile 1					Quantile 5					Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually		Monthly	Quarterly	Semi-Annually	Annually		Monthly	Quarterly	Semi-Annually	Annually	
Market Risk	2.645***	2.353***	3.826***	3.688***		1.604***	1.313***	2.042***	2.683***		1.042***	1.040***	1.784***	1.004***	
Beta	(58.33)	(61.69)	(57.38)	(61.91)		(36.25)	(33.28)	(39.35)	(39.61)		(15.19)	(17.89)	(20.89)	(11.35)	
SMB	0.084***	0.094***	0.103**	0.024		-0.090	-0.072	-0.125	-0.119		0.174**	0.166***	0.228**	0.143*	
	(3.44)	(4.60)	(2.61)	(0.64)		(-1.63)	(-1.66)	(-1.84)	(-1.35)		(3.10)	(3.59)	(3.19)	(1.99)	
HML	0.177*	0.123*	0.242*	0.156*		-0.159**	-0.167***	-0.217**	-0.286***		0.336***	0.290***	0.459***	0.442***	
	(2.54)	(2.07)	(2.28)	(1.97)		(-3.26)	(-4.23)	(-3.24)	(-3.31)		(3.53)	(3.72)	(3.36)	(3.51)	
MOM	0.082	0.133**	0.126	0.098		-0.046	-0.061	-0.135	-0.116		0.127	0.194**	0.261*	0.214*	
	(1.64)	(3.05)	(1.66)	(1.62)		(-1.23)	(-1.73)	(-1.62)	(-1.81)		(1.93)	(3.17)	(2.11)	(2.43)	
Alpha	-0.068%	-0.066%*	-0.023%	-0.017%		-0.062%*	-0.057%*	-0.078%*	-0.093%*		-0.006%	-0.010%	0.053%	0.075%	
	(-1.76)	(-2.05)	(-0.44)	(-0.40)		(-2.14)	(-2.30)	(-2.04)	(-2.01)		(-0.11)	(-0.23)	(0.76)	(1.15)	
N	974	974	974	974		974	974	974	974		974	974	974	974	
R ²	0.839	0.851	0.849	0.892		0.781	0.771	0.768	0.798		0.282	0.352	0.397	0.204	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 20. Buy-signal Revision: Sub-periods under the CAPM

	Quantile 1					Quantile 5					Long-short			
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually		Monthly	Quarterly	Semi-Annually	Annually		Monthly	Quarterly	Semi-Annually	Annually
2005-2009	Market Risk	1.301***	1.284***	1.187***	1.379***	1.092***	1.183***	1.126***	1.406***		0.209***	0.101*	0.0616	-0.0268
	Beta	(27.73)	(35.76)	(31.71)	(37.12)	(31.48)	(24.98)	(25.82)	(28.30)		(5.16)	(2.05)	(1.53)	(-0.72)
	Alpha	-0.017%	-0.022%	-0.042%	-0.028%	-0.037%	-0.034%	-0.052%	-0.042%		0.012%	0.005%	0.002%	0.006%
		(-0.43)	(-0.64)	(-1.27)	(-0.82)	(-1.10)	(-0.80)	(-1.33)	(-0.90)		(0.23)	(0.08)	(0.04)	(0.13)
	N	984	984	984	984	984	984	984	984		984	984	984	984
	R ²	0.731	0.788	0.768	0.812	0.735	0.664	0.685	0.700		0.042	0.009	0.004	0.001
2009-2013	Market Risk	1.851***	1.986***	1.675***	1.875***	1.054***	0.932***	0.792***	0.936***		0.798***	1.055***	0.883***	0.939***
	Beta	(45.03)	(45.58)	(50.31)	(55.62)	(55.76)	(49.26)	(43.20)	(49.43)		(16.46)	(25.59)	(24.68)	(23.55)
	Alpha	0.028%	0.025%	0.006%	-0.033%	-0.067%**	-0.032%	-0.014%	-0.010%		0.092%	0.055%	0.017%	-0.026%
		(0.69)	(0.62)	(0.18)	(-0.97)	(-3.25)	(-1.65)	(-0.73)	(-0.46)		(1.96)	(1.22)	(0.46)	(-0.61)
	Observations	989	989	989	989	989	989	989	989		989	989	989	989
	R ²	0.807	0.823	0.851	0.860	0.834	0.813	0.771	0.783		0.361	0.519	0.536	0.502
2013-2017	Market Risk	4.333***	3.842***	2.800***	2.911***	1.194***	1.611***	1.645***	1.863***		3.139***	2.231***	1.155***	1.048***
	Beta	(49.36)	(41.07)	(57.31)	(58.33)	(59.16)	(53.41)	(57.66)	(65.63)		(36.48)	(22.98)	(21.50)	(19.20)
	Alpha	0.013%	-0.036%	-0.099%*	-0.072%	-0.035%	-0.029%	-0.011%	-0.031%		0.047%	-0.008%	-0.089%	-0.042%
		(0.20)	(-0.54)	(-2.28)	(-1.54)	(-1.85)	(-1.15)	(-0.46)	(-1.17)		(0.68)	(-0.11)	(-1.66)	(-0.75)
	N	974	974	974	974	974	974	974	974		974	974	974	974
	R ²	0.822	0.786	0.818	0.806	0.812	0.815	0.826	0.843		0.688	0.512	0.336	0.269

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 21a. Buy-signal Revision: Sub-periods under the Carhart four-factor model

	Quantile 1				Quantile 5				Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually
2005-2009	Market Risk	1.295*** (27.70)	1.246*** (32.73)	1.165*** (27.54)	1.373*** (37.01)	1.110*** (31.27)	1.187*** (24.85)	1.132*** (26.20)	1.414*** (28.68)	0.186*** (4.22)	0.059 (1.13)	0.033 (0.74)	-0.041 (-0.98)
	Beta												
	SMB	-0.018 (-0.53)	-0.086** (-3.26)	-0.047 (-1.12)	-0.013 (-0.48)	0.040 (1.14)	0.008 (0.22)	0.017 (0.57)	0.020 (0.55)	-0.058 (-1.27)	-0.093* (-2.01)	-0.064 (-1.29)	-0.033 (-0.94)
	HML	-0.125 (-1.87)	-0.135* (-2.42)	-0.008 (-0.16)	0.043 (0.90)	0.047 (0.72)	-0.007 (-0.11)	0.070 (1.24)	0.118 (1.78)	-0.171 (-1.67)	-0.128 (-1.54)	-0.078 (-1.04)	-0.075 (-1.14)
	MOM	0.02e (0.35)	0.022 (0.38)	0.100* (2.20)	0.119* (2.57)	0.055 (1.31)	0.047 (0.78)	0.030 (0.53)	0.137* (2.02)	-0.032 (-0.42)	-0.025 (-0.31)	0.071 (1.10)	-0.017 (-0.26)
	Alpha	-0.024% (-0.62)	-0.035% (-1.06)	-0.052% (-1.59)	-0.034% (-1.01)	-0.033% (-1.09)	-0.036% (-0.86)	-0.049% (-1.29)	-0.043% (-0.93)	0.002% (0.05)	-0.007% (-0.13)	-0.010% (-0.22)	0.002% (0.04)
	N	984	984	984	984	984	984	984	984	984	984	984	984
	R ²	0.734	0.792	0.771	0.814	0.737	0.665	0.686	0.702	0.049	0.015	0.011	0.002
	Market Risk	1.867*** (32.49)	1.964*** (30.95)	1.630*** (33.62)	1.812*** (34.09)	1.033*** (30.61)	0.938*** (32.23)	0.792*** (29.44)	0.930*** (32.71)	0.835*** (13.82)	1.026*** (19.23)	0.838*** (19.38)	0.882*** (17.19)
	Beta												
2009-2013	SMB	0.015 (0.21)	-0.039 (-0.50)	-0.066 (-1.04)	-0.096 (-1.42)	-0.028 (-0.67)	0.006 (0.17)	-0.001 (-0.04)	-0.006 (-0.16)	0.042 (0.61)	-0.045 (-0.72)	-0.065 (-1.20)	-0.090 (-1.44)
	HML	-0.144* (-2.49)	-0.132* (-2.36)	-0.099* (-2.34)	-0.154** (-3.22)	0.024 (0.77)	-0.047 (-1.94)	-0.028 (-1.39)	0.0404 (1.17)	-0.168* (-2.19)	-0.085 (-1.63)	-0.071 (-1.55)	-0.194** (-2.88)
	MOM	-0.038 (-0.77)	-0.051 (-1.00)	-0.129** (-3.25)	-0.147*** (-3.36)	-0.026 (-0.92)	0.006 (0.25)	-0.015 (-0.67)	-0.005 (-0.17)	-0.012 (-0.20)	-0.057 (-1.13)	-0.115** (-2.73)	-0.143** (-2.82)
	Alpha	0.030% (0.75)	0.026% (0.63)	0.002% (0.05)	-0.037% (-1.10)	-0.069%*** (-3.37)	-0.031% (-1.56)	-0.014% (-0.71)	-0.011% (-0.52)	0.096%* (2.08)	0.054% (1.19)	0.013% (0.34)	-0.028% (-0.69)
	N	989	989	989	989	989	989	989	989	989	989	989	989
	R ²	0.809	0.825	0.854	0.864	0.835	0.815	0.772	0.784	0.370	0.521	0.542	0.514
	Market Risk	1.867*** (32.49)	1.964*** (30.95)	1.630*** (33.62)	1.812*** (34.09)	1.033*** (30.61)	0.938*** (32.23)	0.792*** (29.44)	0.930*** (32.71)	0.835*** (13.82)	1.026*** (19.23)	0.838*** (19.38)	0.882*** (17.19)
	Beta												
	SMB	0.015 (0.21)	-0.039 (-0.50)	-0.066 (-1.04)	-0.096 (-1.42)	-0.028 (-0.67)	0.006 (0.17)	-0.001 (-0.04)	-0.006 (-0.16)	0.042 (0.61)	-0.045 (-0.72)	-0.065 (-1.20)	-0.090 (-1.44)
	HML	-0.144* (-2.49)	-0.132* (-2.36)	-0.099* (-2.34)	-0.154** (-3.22)	0.024 (0.77)	-0.047 (-1.94)	-0.028 (-1.39)	0.0404 (1.17)	-0.168* (-2.19)	-0.085 (-1.63)	-0.071 (-1.55)	-0.194** (-2.88)
MOM	-0.038 (-0.77)	-0.051 (-1.00)	-0.129** (-3.25)	-0.147*** (-3.36)	-0.026 (-0.92)	0.006 (0.25)	-0.015 (-0.67)	-0.005 (-0.17)	-0.012 (-0.20)	-0.057 (-1.13)	-0.115** (-2.73)	-0.143** (-2.82)	
Alpha	0.030% (0.75)	0.026% (0.63)	0.002% (0.05)	-0.037% (-1.10)	-0.069%*** (-3.37)	-0.031% (-1.56)	-0.014% (-0.71)	-0.011% (-0.52)	0.096%* (2.08)	0.054% (1.19)	0.013% (0.34)	-0.028% (-0.69)	
N	989	989	989	989	989	989	989	989	989	989	989	989	
R ²	0.809	0.825	0.854	0.864	0.835	0.815	0.772	0.784	0.370	0.521	0.542	0.514	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 21b. Buy-signal Revision: Sub-periods under the Carhart four-factor model

	Quantile 1					Quantile 5					Long-short			
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	
Market Risk	4.342***		3.821***	2.758***	2.873***	1.168***	1.602***	1.630***	1.851***	3.175***	2.219***	1.129***	1.022***	
Beta	(43.50)		(38.75)	(47.83)	(53.77)	(53.69)	(47.03)	(47.06)	(47.39)	(32.41)	(21.84)	(19.58)	(18.14)	
SMB	0.019		-0.035	-0.075	-0.064	-0.049**	-0.019	-0.032	-0.023	0.068	-0.016	-0.043	-0.041	
	(0.27)		(-0.53)	(-1.40)	(-1.44)	(-3.15)	(-0.76)	(-0.91)	(-0.50)	(0.96)	(-0.28)	(-1.02)	(-0.98)	
HML	0.193		0.221*	0.286***	0.372***	0.057	-0.068	-0.141**	-0.177***	0.136	0.289*	0.426***	0.549***	
	(1.73)		(1.97)	(3.90)	(4.51)	(1.47)	(-1.43)	(-2.92)	(-3.76)	(1.14)	(2.34)	(4.53)	(5.79)	
MOM	0.033		0.082	0.036	0.089	-0.019	-0.041	-0.061	-0.036	0.052	0.123	0.097	0.124	
	(0.34)		(0.81)	(0.51)	(1.19)	(-0.65)	(-1.14)	(-1.54)	(-0.84)	(0.51)	(1.13)	(1.08)	(1.39)	
Alpha	0.016%		-0.027%	-0.089%*	-0.060%	-0.032%	-0.030%	-0.013%	-0.033%	0.046%	0.002%	-0.076%	-0.028%	
	(0.23)		(-0.41)	(-2.04)	(-1.28)	(-1.67)	(-1.18)	(-0.54)	(-1.25)	(0.66)	(0.03)	(-1.44)	(-0.50)	
N	974		974	974	974	974	974	974	974	974	974	974	974	
R ²	0.823		0.787	0.821	0.811	0.814	0.815	0.829	0.846	0.689	0.515	0.353	0.296	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 22. Combination: Sub-periods under the CAPM

	Quantile 1				Quantile 5				Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	
2005-2009	Market Risk	1.293*** (39.10)	1.154*** (44.20)	1.195*** (40.77)	1.233*** (41.16)	1.316*** (26.27)	1.322*** (26.13)	1.325*** (26.88)	1.597*** (36.05)	-0.0228 (-0.45)	-0.168*** (-3.31)	-0.130** (-2.58)	-0.364*** (-8.41)
	Beta												
	Alpha	-0.007% (-0.19)	-0.023% (-0.79)	-0.027% (-0.99)	-0.035% (-1.19)	-0.037% (-0.94)	-0.037% (-0.85)	-0.036% (-0.78)	0.019% (0.44)	0.023% (0.43)	0.006% (0.11)	0.000% (0.00)	-0.062% (-1.19)
	N	984	984	984	984	984	984	984	984	984	984	984	984
	R ²	0.791	0.801	0.826	0.817	0.737	0.704	0.688	0.776	0.000	0.024	0.014	0.111
2009-2013	Market Risk	1.513*** (44.19)	1.316*** (49.81)	1.271*** (50.46)	1.250*** (51.53)	1.162*** (69.27)	1.418*** (51.29)	1.210*** (58.12)	2.086*** (58.25)	0.351*** (8.96)	-0.101** (-2.92)	0.0607 (1.82)	-0.836*** (-21.86)
	Beta												
	Alpha	-0.026% (-0.81)	-0.015% (-0.59)	-0.007% (-0.27)	0.006% (0.25)	-0.067%** (-3.26)	-0.014% (-0.51)	-0.032% (-1.45)	-0.050% (-1.32)	0.039% (0.99)	-0.004% (-0.11)	0.023% (0.65)	0.053% (1.22)
	Observations	989	989	989	989	989	989	989	989	989	989	989	989
	R ²	0.816	0.837	0.836	0.849	0.861	0.841	0.856	0.860	0.139	0.014	0.006	0.430
2013-2017	Market Risk	3.331*** (48.47)	3.086*** (53.85)	2.943*** (53.30)	3.289*** (52.66)	1.207*** (69.97)	2.364*** (63.36)	2.079*** (64.25)	3.589*** (67.59)	2.124*** (28.84)	0.723*** (11.32)	0.863*** (14.99)	-0.299*** (-4.14)
	Beta												
	Alpha	0.018% (0.36)	-0.010% (-0.22)	-0.004% (-0.10)	0.034% (0.77)	-0.069%*** (-3.94)	-0.059% (-1.65)	-0.030% (-1.03)	-0.057% (-1.15)	0.086% (1.53)	0.047% (0.78)	0.025% (0.46)	0.090% (1.33)
	N	974	974	974	974	974	974	974	974	974	974	974	974
	R ²	0.819	0.831	0.833	0.858	0.838	0.829	0.845	0.851	0.602	0.132	0.218	0.021

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 23a. Combination: Sub-periods under the Carhart four-factor model

	Quantile 1				Quantile 5				Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually
2005-2009	Market Risk	1.306***	1.150***	1.192***	1.244***	1.305***	1.314***	1.340***	1.565***	0.001	-0.165**	-0.148**	-0.321***
	Beta	(39.77)	(41.26)	(39.45)	(38.20)	(27.06)	(25.81)	(27.63)	(30.59)	(0.02)	(-3.13)	(-2.85)	(-6.79)
	SMB	0.026	-0.011	-0.004	0.030	-0.026	-0.021	0.030	-0.078	0.052	0.010	-0.034	0.108*
		(0.95)	(-0.44)	(-0.17)	(1.33)	(-0.70)	(-0.47)	(0.80)	(-1.41)	(1.21)	(0.20)	(-0.75)	(2.07)
	HML	0.010	-0.002	0.066	0.138**	-0.084	-0.099	-0.077	-0.299***	0.095	0.097	0.143	0.438***
		(0.18)	(-0.05)	(1.40)	(2.82)	(-1.21)	(-1.41)	(-1.08)	(-4.64)	(1.03)	(1.03)	(1.53)	(5.26)
	MOM	0.061	0.075	0.065	0.079	-0.083	-0.078	-0.175**	-0.323***	0.143	0.153	0.240**	0.402***
		(1.28)	(1.76)	(1.60)	(1.90)	(-1.49)	(-1.16)	(-2.61)	(-4.41)	(1.88)	(1.83)	(2.95)	(4.58)
	Alpha	-0.007%	-0.028%	-0.029%	-0.032%	-0.038%	-0.038%	-0.026%	0.020%	0.023%	0.002%	-0.011%	-0.060%
		(-0.21)	(-0.97)	(-1.07)	(-1.09)	(-0.98)	(-0.90)	(-0.59)	(0.46)	(0.44)	(0.04)	(-0.21)	(-1.18)
N	984	984	984	984	984	984	984	984	984	984	984	984	
R ²	0.792	0.802	0.827	0.819	0.739	0.705	0.692	0.788	0.008	0.031	0.030	0.167	
2009-2013	Market Risk	1.569***	1.381***	1.343***	1.319***	1.105***	1.379***	1.187***	2.087***	0.464***	0.00138	0.156***	-0.767***
	Beta	(32.82)	(33.79)	(35.39)	(37.27)	(32.68)	(32.36)	(32.37)	(34.48)	(9.40)	(0.03)	(3.49)	(-14.77)
	SMB	0.077	0.090	0.106*	0.101*	-0.083	-0.065	-0.036	-0.010	0.160**	0.156***	0.142**	0.110*
		(1.39)	(1.90)	(2.20)	(2.19)	(-1.87)	(-1.20)	(-0.84)	(-0.13)	(3.21)	(3.33)	(3.15)	(2.10)
	HML	-0.002	0.017	0.075*	0.056	-0.028	-0.134***	-0.040	-0.097*	0.026	0.151**	0.115**	0.154**
		(-0.06)	(0.53)	(2.28)	(1.85)	(-1.14)	(-3.59)	(-1.52)	(-2.14)	(0.54)	(3.17)	(2.62)	(2.96)
	MOM	0.097**	0.099**	0.095**	0.083**	-0.036	0.012	-0.001	0.078	0.133**	0.087*	0.095**	0.0052
		(2.72)	(3.18)	(3.09)	(2.79)	(-1.24)	(0.33)	(-0.02)	(1.70)	(3.26)	(2.30)	(2.66)	(0.12)
	Alpha	-0.020%	-0.010%	-0.002%	0.010%	-0.070%***	-0.012%	-0.032%	-0.044%	0.047%	-0.001%	0.027%	0.051%
		(-0.64)	(-0.38)	(-0.10)	(0.42)	(-3.37)	(-0.43)	(-1.42)	(-1.17)	(1.22)	(-0.03)	(0.77)	(1.19)
N	989	989	989	989	989	989	989	989	989	989	989	989	
R ²	0.819	0.841	0.840	0.853	0.863	0.845	0.857	0.862	0.159	0.035	0.025	0.437	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 23b. Combination: Sub-periods under the Carhart four-factor model

	Quantile 1					Quantile 5					Long-short			
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	
Market Risk		3.361***	3.082***	2.936***	3.273***	1.181***	2.323***	2.049***	3.537***	2.180***	0.759***	0.887***	-0.263**	
Beta		(45.45)	(51.71)	(52.85)	(48.95)	(51.31)	(48.53)	(46.75)	(43.75)	(27.81)	(10.52)	(14.18)	(-2.95)	
SMB		0.065	-0.003	-0.005	-0.022	-0.048	-0.083	-0.061	-0.105	0.113**	0.080	0.056	0.083	
		(1.48)	(-0.10)	(-0.15)	(-0.58)	(-1.77)	(-1.57)	(-1.16)	(-0.99)	(2.59)	(1.43)	(1.03)	(0.93)	
HML		0.139	0.325***	0.323***	0.280***	0.050	-0.067	-0.182**	-0.425***	0.089	0.392***	0.505***	0.705***	
		(1.54)	(3.88)	(4.03)	(3.54)	(1.45)	(-1.00)	(-3.30)	(-5.05)	(0.90)	(3.72)	(5.08)	(5.84)	
MOM		0.169*	0.103	0.126	0.138*	-0.031	-0.155**	-0.129*	-0.205*	0.199*	0.258**	0.255**	0.343**	
		(2.45)	(1.46)	(1.86)	(2.02)	(-0.97)	(-2.65)	(-2.44)	(-2.28)	(2.55)	(2.74)	(2.93)	(3.04)	
Alpha		0.022%	-0.002%	0.005%	0.045%	-0.066%***	-0.060%	-0.033%	-0.063%	0.087%	0.057%	0.037%	0.107%	
		(0.43)	(-0.04)	(0.11)	(1.01)	(-3.77)	(-1.67)	(-1.12)	(-1.28)	(1.53)	(0.94)	(0.69)	(1.59)	
N		974	974	974	974	974	974	974	974	974	974	974	974	
R ²		0.821	0.834	0.837	0.861	0.840	0.831	0.849	0.856	0.606	0.153	0.251	0.072	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 24. Target Price Dispersion: equal-weighted

Quantile 1						Quantile 5					Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually		Monthly	Quarterly	Semi-Annually	Annually		Monthly	Quarterly	Semi-Annually	Annually
CAPM	Market Risk Beta	2.050*** (30.09)	1.727*** (30.98)	1.629*** (29.36)	1.963*** (28.66)		1.812*** (49.35)	1.810*** (47.40)	1.486*** (54.29)	1.852*** (49.62)		0.238*** (4.45)	-0.0829* (-2.15)	0.143** (3.17)	0.112* (2.12)
	Alpha	0.076% (1.73)	0.056% (1.53)	0.060% (1.65)	0.082% (1.83)		-0.029% (-1.11)	-0.018% (-0.68)	-0.042%* (-2.07)	-0.030% (-1.16)		0.102%* (2.23)	0.071% (1.85)	0.098%*** (2.61)	0.108%* (2.38)
	N	2948	2948	2948	2948		2948	2948	2948	2948		2948	2948	2948	2948
	R ²	0.576	0.584	0.555	0.548		0.745	0.739	0.773	0.760		0.017	0.003	0.009	0.004
	Market Risk Beta	2.028*** (29.22)	1.714*** (30.13)	1.612*** (28.42)	1.942*** (27.82)		1.802*** (48.17)	1.801*** (46.25)	1.477*** (52.74)	1.845*** (48.54)		0.226*** (4.12)	-0.0869* (-2.20)	0.135** (2.90)	0.0974 (1.80)
Fama-French's three-factor model	SMB	-0.065* (-2.26)	-0.033 (-1.52)	-0.045 (-1.91)	-0.057 (-1.81)		-0.037* (-2.03)	-0.033* (-2.10)	-0.029* (-2.23)	-0.021 (-1.50)		-0.028 (-1.07)	0.001 (0.03)	-0.017 (-0.62)	-0.036 (-1.15)
	HML	-0.056 (-1.52)	-0.066* (-2.21)	-0.081** (-2.78)	-0.079* (-2.15)		0.011 (0.55)	0.014 (0.66)	-0.022 (-1.47)	-0.008 (-0.35)		-0.067 (-1.73)	-0.079* (-2.51)	-0.058* (-2.08)	-0.071 (-1.88)
	Alpha	0.081% (1.81)	0.057% (1.56)	0.063% (1.71)	0.085% (1.89)		-0.026% (-1.00)	-0.016% (-0.59)	-0.040%* (-1.98)	-0.029% (-1.11)		0.103%* (2.25)	0.070% (1.82)	0.100%*** (2.61)	0.110%* (2.41)
	N	2947	2947	2947	2947		2947	2947	2947	2947		2947	2947	2947	2947
	R ²	0.577	0.584	0.556	0.549		0.746	0.740	0.774	0.760		0.018	0.005	0.010	0.005
Carhart four-factor model	Market Risk Beta	2.033*** (29.20)	1.718*** (30.06)	1.615*** (28.40)	1.946*** (27.78)		1.800*** (47.80)	1.799*** (46.08)	1.476*** (52.48)	1.843*** (48.41)		0.233*** (4.21)	-0.0810* (-2.04)	0.139** (2.99)	0.104 (1.92)
	SMB	-0.048 (-1.74)	-0.018 (-0.77)	-0.032 (-1.48)	-0.043 (-1.47)		-0.045* (-1.96)	-0.041* (-2.41)	-0.033* (-2.49)	-0.032* (-1.99)		-0.003 (-0.09)	0.024 (1.02)	0.001 (0.04)	-0.011 (-0.38)
	HML	-0.029 (-0.80)	-0.042 (-1.44)	-0.060* (-2.11)	-0.056 (-1.56)		-0.002 (-0.07)	0.001 (0.04)	-0.028 (-1.78)	-0.024 (-1.07)		-0.028 (-0.69)	-0.042 (-1.36)	-0.031 (-1.12)	-0.032 (-0.86)
	MOM	0.100** (3.00)	0.089** (3.20)	0.078** (2.85)	0.086** (2.61)		-0.047* (-1.97)	-0.047* (-1.98)	-0.022 (-1.24)	-0.060* (-2.50)		0.147*** (3.91)	0.135*** (4.31)	0.100*** (3.36)	0.146*** (4.04)
	Alpha	0.085% (1.91)	0.062% (1.67)	0.067% (1.81)	0.089%* (1.98)		-0.029% (-1.08)	-0.018% (-0.67)	-0.041%* (-2.02)	-0.032% (-1.21)		0.110%* (2.40)	0.076%* (1.98)	0.103%*** (2.74)	0.117%* (2.57)
CAPM	N	2947	2947	2947	2947		2947	2947	2947	2947		2947	2947	2947	2947
	R ²	0.578	0.585	0.557	0.550		0.746	0.740	0.774	0.761		0.022	0.010	0.013	0.009

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 25. Recommendations Dispersion: equal-weighted

Quantile 1					Quantile 5					Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually		
CAPM	Market Risk	1.408*** (40.60)	1.383*** (40.69)	1.579*** (36.14)	1.685*** (32.05)	1.471*** (46.46)	1.365*** (48.22)	1.550*** (51.81)	1.718*** (45.46)	-0.063* (-2.51)	0.018 (0.73)	0.029 (0.93)	-0.033 (-1.01)	
	Alpha	-0.009% (-0.36)	-0.009% (-0.38)	0.019% (0.64)	0.046% (1.40)	-0.012% (-0.54)	-0.011% (-0.54)	-0.017% (-0.72)	0.002% (0.08)	-0.001% (-0.03)	-0.002% (-0.06)	0.031% (1.06)	0.039% (1.24)	
	N	2948	2948	2948	2948	2948	2948	2948	2948	2948	2948	2948	2948	
	R ²	0.673	0.688	0.652	0.628	0.733	0.732	0.742	0.707	0.003	0.000	0.001	0.001	
	Market Risk	1.403*** (40.16)	1.379*** (40.05)	1.572*** (35.44)	1.679*** (31.43)	1.462*** (44.82)	1.360*** (47.04)	1.544*** (50.72)	1.707*** (44.53)	-0.0592* (-2.30)	0.0191 (0.73)	0.0280 (0.89)	-0.0284 (-0.85)	
Fama-French's three-factor model	SMB	-0.012 (-0.79)	-0.004 (-0.27)	-0.013 (-0.70)	-0.010 (-0.49)	-0.029 (-1.59)	-0.013 (-0.88)	-0.019 (-1.05)	-0.036 (-1.82)	0.018 (0.89)	0.009 (0.55)	0.006 (0.34)	0.025 (1.59)	
	HML	-0.040* (-2.10)	-0.050* (-2.41)	-0.051* (-2.04)	-0.046 (-1.70)	-0.008 (-0.45)	-0.010 (-0.57)	-0.005 (-0.27)	0.005 (0.22)	-0.032 (-1.57)	-0.040 (-1.93)	-0.046 (-1.91)	-0.050* (-2.01)	
	Alpha	-0.009% (-0.35)	-0.009% (-0.40)	0.019% (0.64)	0.045% (1.37)	-0.011% (-0.47)	-0.011% (-0.54)	-0.016% (-0.70)	0.005% (0.16)	-0.002% (-0.07)	-0.002% (-0.08)	0.031% (1.05)	0.037% (1.15)	
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	
	R ²	0.674	0.689	0.653	0.628	0.734	0.732	0.742	0.707	0.005	0.002	0.002	0.002	
Carhart four-factor model	Market Risk	1.404*** (39.94)	1.380*** (39.91)	1.573*** (35.35)	1.680*** (31.37)	1.461*** (44.57)	1.359*** (46.78)	1.543*** (50.39)	1.707*** (44.27)	-0.0575* (-2.21)	0.0217 (0.83)	0.0300 (0.95)	-0.0275 (-0.82)	
	SMB	-0.008 (-0.50)	0.001 (0.08)	-0.009 (-0.48)	-0.007 (-0.35)	-0.032 (-1.57)	-0.018 (-1.02)	-0.023 (-1.11)	-0.036 (-1.77)	0.024 (1.02)	0.019 (0.93)	0.014 (0.68)	0.029 (1.73)	
	HML	-0.034 (-1.76)	-0.041* (-2.00)	-0.044 (-1.78)	-0.041 (-1.48)	-0.013 (-0.72)	-0.017 (-1.02)	-0.011 (-0.60)	0.004 (0.20)	-0.022 (-1.07)	-0.024 (-1.16)	-0.033 (-1.41)	-0.045 (-1.74)	
	MOM	0.023 (1.17)	0.033 (1.65)	0.025 (1.07)	0.018 (0.70)	-0.017 (-0.92)	-0.027 (-1.63)	-0.022 (-1.12)	-0.002 (-0.07)	0.040 (1.83)	0.060** (2.64)	0.047 (1.94)	0.020 (0.78)	
	Alpha	-0.008% (-0.30)	-0.008% (-0.34)	0.020% (0.68)	0.046% (1.40)	-0.011% (-0.51)	-0.013% (-0.60)	-0.017% (-0.75)	0.004% (0.16)	0.000% (0.00)	0.001% (0.03)	0.033% (1.12)	0.038% (1.18)	
N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947		
R ²	0.674	0.689	0.653	0.628	0.734	0.732	0.742	0.707	0.005	0.004	0.003	0.003		

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 26. Buy-signal Revision: equal-weighted

	Quantile 1				Quantile 5				Long-short				
	Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually
CAPM	Market Risk Beta	2.277*** (30.35)	1.872*** (33.92)	2.221*** (38.24)	1.864*** (44.17)	1.207*** (65.81)	1.565*** (49.36)	1.298*** (45.83)	1.351*** (38.62)	1.070*** (15.43)	0.307*** (7.41)	0.923*** (20.31)	0.514*** (18.02)
	Alpha	0.041% (0.97)	0.039% (1.09)	0.009% (0.23)	-0.014% (-0.48)	-0.038%* (-2.36)	0.002% (0.08)	0.001% (0.07)	0.008% (0.33)	0.076% (1.74)	0.033% (0.93)	0.003% (0.09)	-0.025% (-0.88)
	N	2948	2948	2948	2948	2948	2948	2948	2948	2948	2948	2948	2948
	R ²	0.645	0.640	0.690	0.732	0.775	0.725	0.694	0.678	0.277	0.046	0.284	0.168
Fama-French's three-factor model	Market Risk Beta	2.267*** (29.51)	1.863*** (33.02)	2.204*** (37.30)	1.857*** (43.63)	1.203*** (63.18)	1.555*** (48.18)	1.292*** (44.61)	1.344*** (37.75)	1.064*** (15.00)	0.308*** (7.25)	0.912*** (19.76)	0.513*** (17.95)
	SMB	-0.031 (-1.19)	-0.030 (-1.47)	-0.055 (-1.71)	-0.029 (-1.47)	-0.012 (-0.80)	-0.032* (-2.30)	-0.018 (-1.32)	-0.019 (-1.51)	-0.019 (-0.70)	0.002 (0.08)	-0.037 (-1.36)	-0.009 (-0.54)
	HML	-0.007 (-0.22)	-0.003 (-0.09)	-0.002 (-0.05)	0.020 (0.83)	-0.009 (-0.69)	-0.013 (-0.71)	-0.007 (-0.45)	-0.009 (-0.56)	0.001 (0.04)	0.011 (0.41)	0.005 (0.18)	0.029 (1.27)
	Alpha	0.043% (0.99)	0.040% (1.12)	0.013% (0.33)	-0.012% (-0.41)	-0.037%* (-2.28)	0.004% (0.18)	0.003% (0.12)	0.009% (0.37)	0.076% (1.73)	0.032% (0.89)	0.006% (0.16)	-0.024% (-0.84)
	N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
Carhart four-factor model	Market Risk Beta	2.265*** (29.47)	1.863*** (32.97)	2.203*** (37.10)	1.858*** (43.50)	1.203*** (62.75)	1.554*** (47.90)	1.291*** (44.35)	1.343*** (37.55)	1.063*** (14.99)	0.309*** (7.28)	0.912*** (19.68)	0.515*** (18.02)
	SMB	-0.037 (-1.33)	-0.028 (-1.38)	-0.060 (-1.68)	-0.025 (-1.33)	-0.013 (-0.78)	-0.036* (-2.23)	-0.021 (-1.40)	-0.024 (-1.56)	-0.024 (-0.92)	0.008 (0.35)	-0.039 (-1.34)	-0.002 (-0.09)
	HML	-0.017 (-0.52)	0.001 (0.02)	-0.010 (-0.33)	0.026 (1.04)	-0.010 (-0.74)	-0.020 (-1.07)	-0.012 (-0.77)	-0.016 (-0.98)	-0.007 (-0.20)	0.020 (0.71)	0.002 (0.07)	0.042 (1.80)
	MOM	-0.035 (-1.03)	0.011 (0.40)	-0.031 (-0.94)	0.020 (0.83)	-0.004 (-0.25)	-0.024 (-1.19)	-0.018 (-1.07)	-0.026 (-1.30)	-0.031 (-0.88)	0.035 (1.28)	-0.012 (-0.39)	0.045 (1.89)
	Alpha	0.041% (0.95)	0.040% (1.13)	0.011% (0.29)	-0.011% (-0.38)	-0.038%* (-2.29)	0.003% (0.13)	0.002% (0.08)	0.007% (0.32)	0.075% (1.69)	0.033% (0.94)	0.005% (0.15)	-0.022% (-0.77)
N	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947	2947
R ²	0.645	0.641	0.691	0.733	0.775	0.726	0.694	0.679	0.679	0.278	0.046	0.284	0.169

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 27. Combination: equal-weighted

Quantile 1					Quantile 5				Long-short				
Rebalancing	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	Monthly	Quarterly	Semi-Annually	Annually	
CAPM	Market Risk	2.161*** (31.81)	1.687*** (34.85)	1.670*** (34.63)	1.750*** (33.38)	1.326*** (60.13)	1.676*** (55.29)	1.414*** (56.30)	1.564*** (49.65)	0.835*** (12.02)	0.0112 (0.30)	0.255*** (6.44)	0.186*** (4.74)
	Alpha	0.064% (1.49)	0.023% (0.73)	0.035% (1.12)	0.051% (1.49)	-0.055%*** (-3.23)	-0.017% (-0.76)	-0.021% (-1.08)	-0.006% (-0.25)	0.114%* (2.44)	0.036% (1.09)	0.052% (1.62)	0.053% (1.57)
	N	2947	2948	2948	2948	2947	2948	2948	2948	2947	2948	2948	2948
	R ²	0.617	0.644	0.648	0.619	0.793	0.777	0.766	0.760	0.168	0.000	0.039	0.019
	Market Risk	2.149*** (30.99)	1.680*** (34.11)	1.659*** (33.77)	1.738*** (32.64)	1.321*** (58.82)	1.668*** (54.46)	1.411*** (55.25)	1.558*** (48.60)	0.828*** (11.66)	0.0126 (0.33)	0.248*** (6.09)	0.180*** (4.50)
Fama-French's three-factor model	SMB	-0.036 (-1.22)	-0.018 (-0.91)	-0.028 (-1.32)	-0.029 (-1.23)	-0.017 (-1.91)	-0.033* (-2.52)	-0.013 (-1.17)	-0.016 (-1.26)	-0.019 (-0.60)	0.015 (0.69)	-0.015 (-0.64)	-0.013 (-0.58)
	HML	-0.022 (-0.67)	-0.035 (-1.36)	-0.047* (-1.96)	-0.068* (-2.29)	0.009 (0.64)	0.018 (0.96)	0.004 (0.27)	-0.022 (-1.37)	-0.031 (-0.83)	-0.052 (-1.85)	-0.051* (-1.97)	-0.046 (-1.59)
	Alpha	0.066% (1.51)	0.024% (0.74)	0.036% (1.15)	0.052% (1.49)	-0.053%*** (-3.13)	-0.014% (-0.64)	-0.020% (-1.04)	-0.005% (-0.23)	0.115%* (2.43)	0.034% (1.02)	0.052% (1.62)	0.053% (1.56)
	N	2946	2947	2947	2947	2946	2947	2947	2947	2946	2947	2947	2947
	R ²	0.617	0.645	0.648	0.620	0.793	0.778	0.766	0.760	0.168	0.002	0.040	0.020
Carhart four-factor model	Market Risk	2.152*** (30.95)	1.683*** (33.97)	1.661*** (33.70)	1.742*** (32.59)	1.321*** (58.46)	1.666*** (54.23)	1.410*** (54.92)	1.558*** (48.34)	0.828*** (11.65)	0.0178 (0.47)	0.253*** (6.22)	0.187*** (4.66)
	SMB	-0.022 (-0.78)	-0.006 (-0.30)	-0.019 (-0.92)	-0.015 (-0.65)	-0.018 (-1.95)	-0.038** (-2.81)	-0.016 (-1.44)	-0.017 (-1.25)	-0.039 (-1.22)	0.023 (1.02)	-0.006 (-0.26)	0.014 (0.53)
	HML	-0.001 (-0.02)	-0.016 (-0.63)	-0.032 (-1.35)	-0.046 (-1.60)	0.007 (0.48)	0.012 (0.57)	-0.001 (-0.08)	-0.024 (-1.49)	-0.181** (-2.71)	-0.063 (-1.40)	-0.042 (-1.01)	0.042 (0.96)
	MOM	0.080* (2.44)	0.068*** (2.78)	0.054* (2.34)	0.080** (3.17)	-0.007 (-0.49)	-0.027 (-1.43)	-0.019 (-1.17)	-0.007 (-0.41)	0.059 (1.57)	0.093*** (3.38)	0.075** (2.95)	0.101*** (3.78)
	Alpha	0.069% (1.60)	0.027% (0.84)	0.038% (1.23)	0.056% (1.60)	-0.054%*** (-3.14)	-0.016% (-0.70)	-0.021% (-1.08)	-0.006% (-0.25)	0.119%* (2.52)	0.039% (1.17)	0.056% (1.74)	0.058% (1.69)
N	2946	2947	2947	2947	2946	2947	2947	2947	2946	2947	2947	2947	
R ²	0.618	0.645	0.649	0.621	0.793	0.778	0.767	0.760	0.172	0.005	0.042	0.023	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 28.

Summary Statistics of Benchmark Returns Over Three sub-periods

Panel A and Panel B present descriptive statistics of the daily and annual mean return as well as the daily return standard deviation for the two benchmarks divided into three time periods; March 2005 to February 2009, March 2009 to January 2013, and February 2013 to January 2017.

Panel A: Mean Returns of the OMX Stockholm Benchmark Index

Sub-period	Mean Daily Return	Mean Yearly Return	Daily SD
2005-2009	-0.006%	-1.412%	1.662%
2009-2013	0.070%	17.574%	1.439%
2013-2017	0.039%	9.761%	1.067%

Panel B: Mean Returns of the Benchmark Consisting of All Swedish Stocks

Sub-period	Mean Daily Return	Mean Yearly Return	Daily SD
2005-2009	0.008%	1.921%	1.586%
2009-2013	0.086%	21.576%	1.396%
2013-2017	0.058%	14.661%	1.022%

Figure 1a. Target Price Dispersion, monthly rebalancing

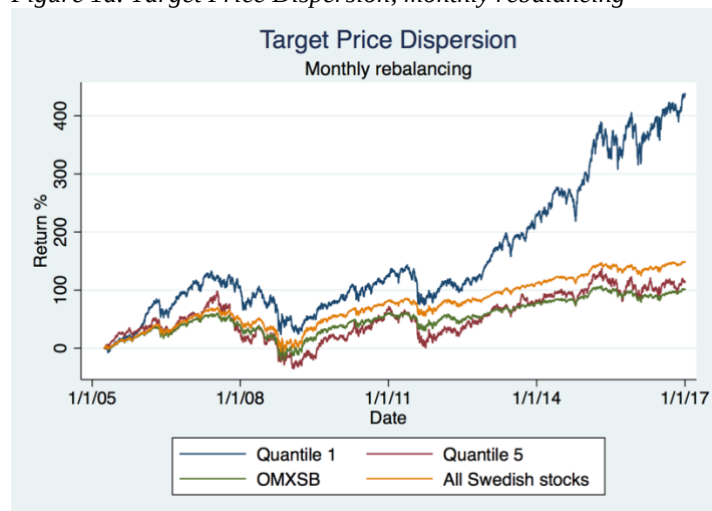


Figure 1b. Target Price Dispersion, quarterly rebalancing

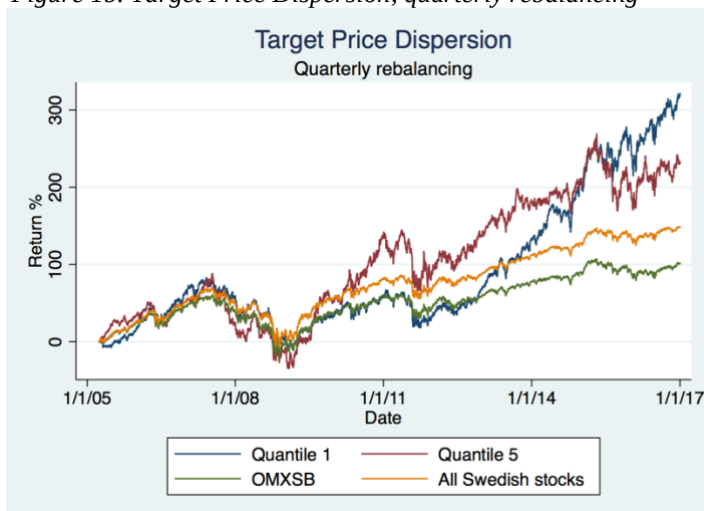


Figure 1c. Target Price Dispersion, semi-annual rebalancing

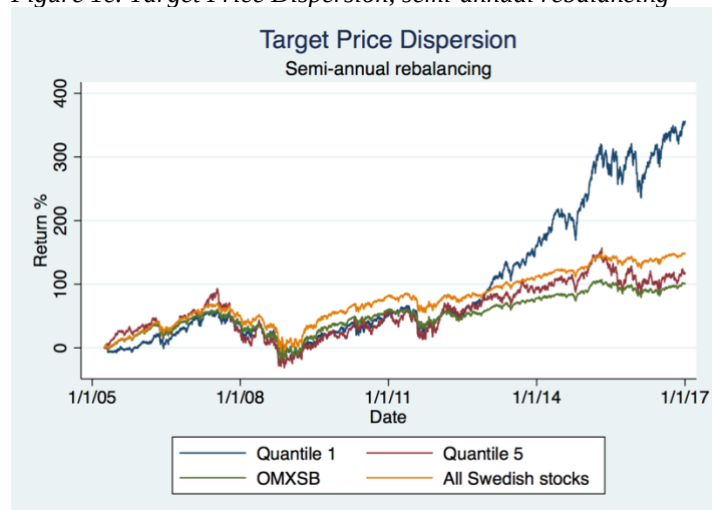


Figure 1d. Target Price Dispersion, annual rebalancing

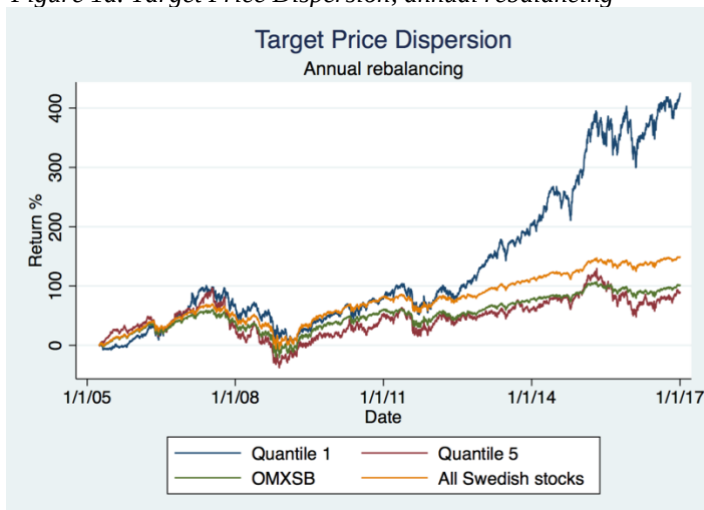


Figure 1e. Target Price Dispersion, long-short portfolios



Figure 2a. Recommendation Dispersion, monthly rebalancing



Figure 2b. Recommendation Dispersion, quarterly rebalancing



Figure 2a. Recommendation Dispersion, semi-annual rebalancing

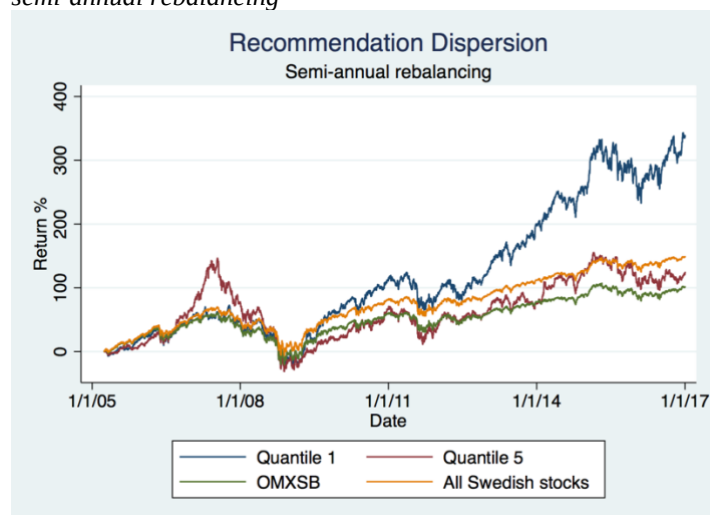


Figure 2b. Recommendation Dispersion, annual rebalancing

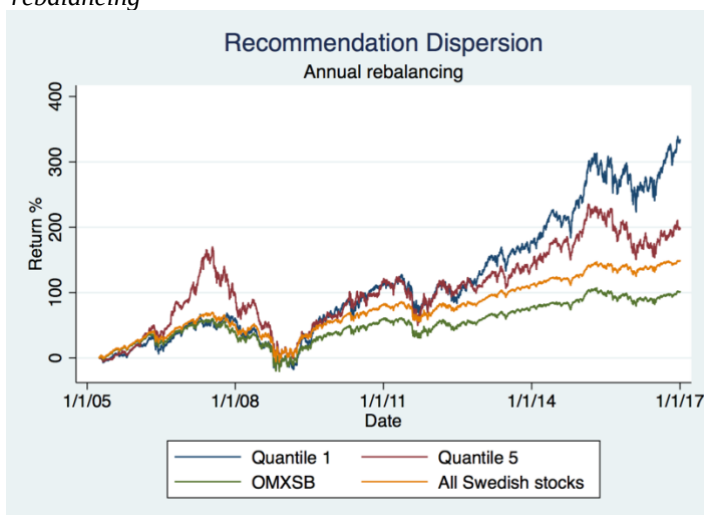


Figure 2e. Recommendation Dispersion, long-short portfolios



Figure 3a. Buy-signal Revision, monthly rebalancing

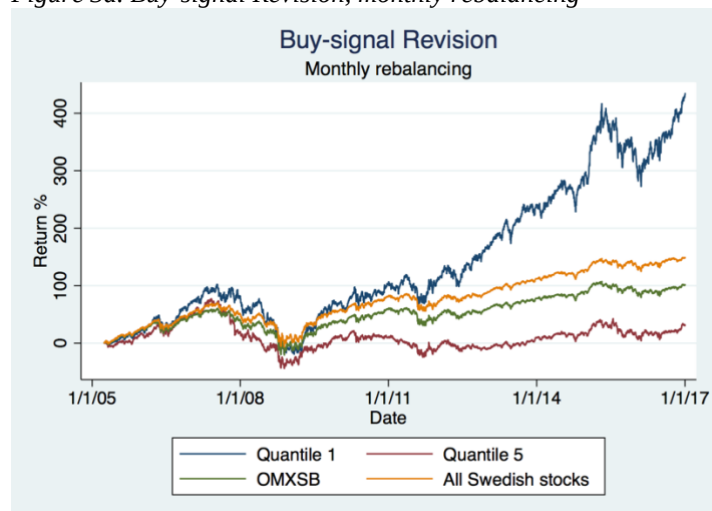


Figure 3b. Buy-signal Revision, quarterly rebalancing

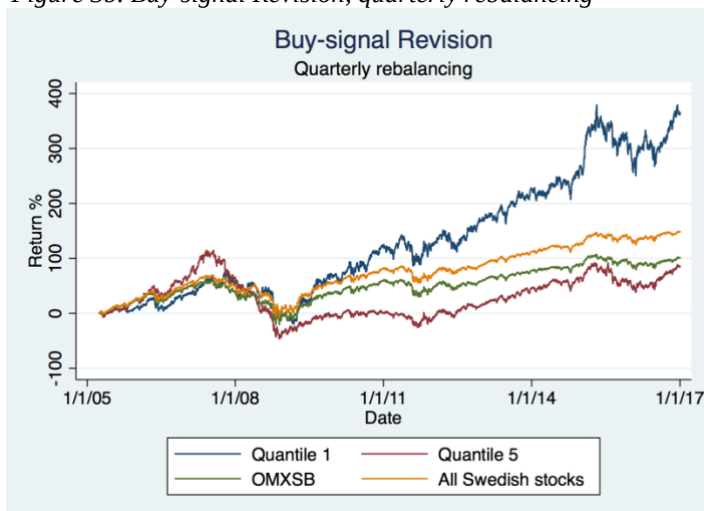


Figure 3c. Buy-signal Revision, semi-annual rebalancing



Figure 3d. Buy-signal Revision, annual rebalancing



Figure 3e. Buy-signal Revision, long-short portfolio



Figure 4a. Combination, monthly rebalancing



Figure 4b. Combination, quarterly rebalancing



Figure 4c. Combination, semi-annual rebalancing



Figure 4d. Combination, annual rebalancing



Figure 4e. Combination Strategy, long-short portfolio

