Trend – Emotion – Timing

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A submission to the NAAIM Founders Award 2025

Abstract

There is an antagonism in the market behavior: On a short-term basis prices tend to mean revert while on a medium term a momentum manner can be observed. This has an essential backdrop for any trend-following strategy, since trend-following signals are often triggered in overbought or oversold conditions. This paper provides the statistical evidence of these market characteristics and develops tools to overcome this polarity.

To study the trend-behavior of the markets we need several definitions of "the trend" and use four different technical indicators each with ten varying time-frames. For this set of indicators we explore the nature of trend-following: There is no benefit in conjunction with a time-stop, but there is a value in trend-following in using a counter-signal for exiting. A further analysis proves that the relevance of the momentum-effect is even more evident in the context of benchmarking.

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So far we analyzed forty trend-following indicators, but such a big set of indicators is not feasible for an investment approach, since their signals will conflict each other. Therefore we interpret each indicator as one vote in a poll. The result is the Trend-Score and its interpretation is straight-forward: A positive value is linked to an up-trend and the higher its value is, the clearer or stronger is this up-trend. This idea of a Trend-Score is extended to respect several benchmarks.

In the next step we explore the emotions of the investors for a stock, which are usually effected on a short term basis. We use several technical oscillators on time-frames up to one month to define an *Emotion-Index* in a similar manner to the Trend-Score. The statistical analysis proves that the ingredients of the *Emotion-Index* are statistically relevant and documents the short-term mean-reverting behavior of the stock market.

So far the short-term mean-reverting and medium-term momentum characteristics of the stock market is described and consistently quantified. To overcome the different market behaviors in the short and medium term, the Anchored-Trend-Score is proposed, which is based on the idea to evaluate the Trend-Score of a stock during least emotional times, hence if the Emotion-Index is close to zero. And of course, the Anchored-Trend-Score considers benchmarks too.

Timing the markets is a challenging task and a general advice is to buy up-trending stocks when their prices correct and are not overbought any more. This recipe can be quantified using the indicators introduced so far: We define the Timing-Indicator as the difference of the Anchored-Trend-Score and the Emotion-Index. The statistical analysis of this so defined Timing-Indicator proves this to be a valuable approach.

There are two applications of these indicators and their statistical properties. The first is dedicated to discretionary investors who want to spot either interesting timing opportunities or the strongest trends in the market. For this purpose we link the preceding results into one graphical representation of the market, a Trend-Emotion-Timing-Chart of the stocks is presented and discussed. This novel chart allows to spot easily opportunities from a timing point of view: Entering into a stock, which has an up-trend but is currently oversold (or vice versa), hence where the absolute value of the Timing-Indicator exceeds the significant threshold of 1.0. On the other hand, the stocks with a clear up- or down-trend can easily be identified, adjusted such that the initial buy-signals do not occur in overbought conditions.

For the second and quantitative application of this research, we reconsider the classical portfolio theory of the Nobel laureates Markowitz and Sharpe. One permanent challenge in applying their theory is to estimate the return of a

stock. While usual trend-following approaches overestimate the returns when a stock is overbought (and vice versa), the Anchored-Trend-Score solves this issue – together with the historical volatility of the stock. The consideration of benchmarks, including the benchmark with respect to a risk-free-rate modifies the expression for the Sharpe-ratio, but the fundamentals of the classical approach are unchanged. An example based on the Dow-Jones-Index is shown; and for the sake of a simple example the risk was measured as standard derivation of the portfolio. The concept can easily be generalized to more advanced techniques to quantify the financial risk. Hence a quantitative approach to construct an optimal, trend-following portfolio is established, which does not suffer from the pro-cyclical occurrence of trend signals any more.

Final remarks on the presented results and ideas for further research complete this paper. In the appendix the statistical results are shown to document the stated market behavior as well as the benefit of the proposed indicators. The basis of this test were the stocks of the S&P 500 index as of 9/30/2024 and the period for all the analysis covers good ten years, more specifically the period from January 2015 to June 2024.

1 Trend

1.1 The technical indicators used

To review the characteristics of trend-following approaches, we define several ways to define a trend. There are plenty methods to do so and for this paper four indicators are selected, each used with ten different timeframes. That is our pool of indicators for the trend analysis (Figure 1). These indicators are well-known and we assign a value of 1.0, if there is a buy signal, a value of -1.0 if there is a sell signal and a value of 0.0 in any other cases or unclear cases, e.g. not enough data, the absolute value of the regression-slope is less than its statistical error.

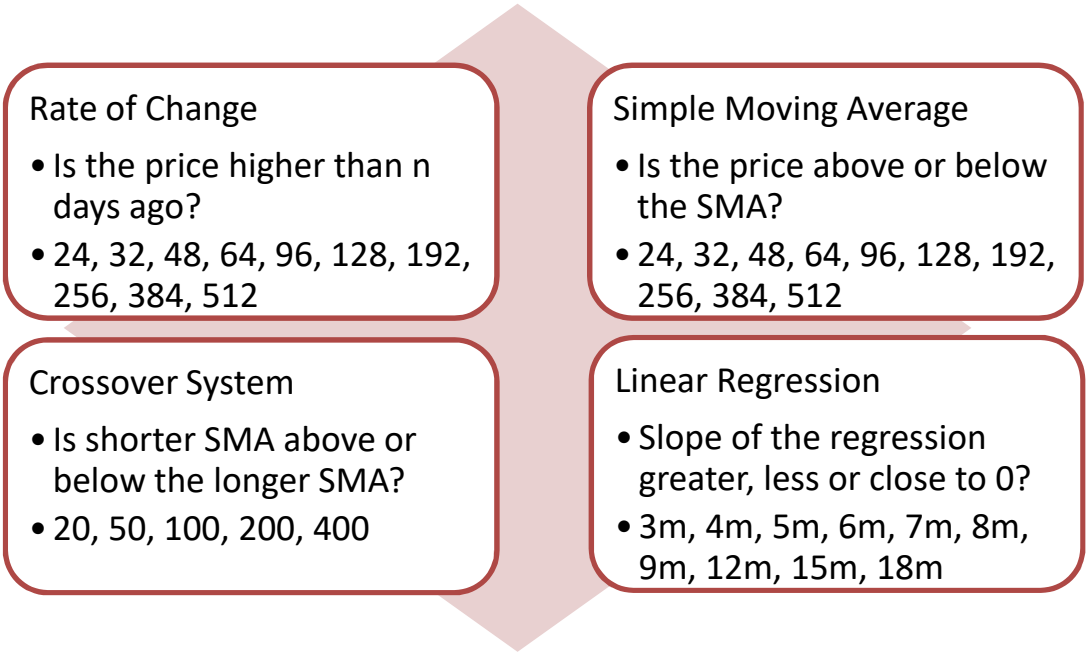

Figure 1: Overview of the basic trend-following indicators used

The time-frame for the Rate-of-change and the Simple-Moving-Averages are chosen as powers of two or the mean of two adjacent powers of two. The time

span (using daily data throughout this paper) ranges from roughly one month up to one and a half year.

1.2 Trend indicators and timing

To test the presented trend-following indicators with respect to their prediction strength, we perform a statistical analysis of each indicator. For each indicator signal at some date it is checked, if the stock was higher or lower after a certain period of time and the return of such a trade measured in terms of

$$ln\left(\frac{Close_{date+period}}{Close_{date}}\right) = ln\left(Close_{date+period}\right) - ln(Close_{date})$$

This logarithmic approach to measure the return is used to consider the fact, that a 25% gain is needed to compensate a 20% loss; please recall that $ln(1 + 0.25) = -ln(1 - 0.2)$.

The results for the excess probabilities, hence the difference of the probability of a rising stock price depending on the indicator signal being 1.0 or -1.0 are shown in Figure 5. In the most cases, the probability of a profitable long trade is reduced, when a trend-following indicator provides an up-trend signal. That seems counter-intuitive, only for some long-term time-frames there is a positive impact of the trend-following signals.

Looking at the excess returns in the same figure, there is only one data point with a positive excess return at all. The clear conclusion of this analysis is, that trend-following signals are worse for timing – there is no advantage in assuming that a trend will persist at all. We come back later on this and provide a reasonable explanation in section 3.2.

1.3 Trend-following

Do the previous results contradict the thesis of profitable trend-following? Instead of evaluating each indicator signal on its prediction power over a fixed time horizon, we could study the power of each indicator using a simple trading strategy: Just go long, as soon as the indicator signals 1.0 and exit the position, if it is not 1.0 anymore.

The win probability and the average return per trade of this simple trading approach is presented in Figure 6. The probability to win is usually less than 50%, but the average return is positive for each studied indicator. This is the typical characteristics of trend-following trading approach.

A reasoning of the difference to the first analysis is, that in this case the exit is not determined by a fixed time stop, but by a counter-signal of the trend-following indicator. Since the probability of a winning trade is rather small, a fast exit is necessary for an active trend-following investment approach, or as the saying runs: “The trend is your friend until the end!”

1.4 Construction of the Trend-Score

An active investor may choose any of these trend-following strategies, but each will provide different results. The novel idea is to construct a Trend-Score based on our 40 trend-following indicators similar to a poll:

$$TrendScore = \frac{1}{40} \sum_{i=1}^{40} TrendIndicator_i$$

Remember, that the result of each indicator is either -1.0, 1.0 or 0.0. If all Indicators provide a 1.0, hence all votes are in favor of an up-trend, the Trend-Score is 1.0. If all indicators provide -1.0, the resulting Trend-Score is -1.0. And if the indicators provide as much votes in favor for an up-trend as for a down-trend, the Trend-Score computes to 0.0, the result if there is no clear trend at all. Hence the sign of the Trend-Score provides the direction of the trend, and the absolute value its quality.

The advantage of this approach is, that we do not have to decide for a certain kind of trend-following indicator or a fixed time-frame. And such a choice is difficult, since the optimal setup in the past may not be the best setup for the future. Additionally, the change of the Trend-Score is much smoother than just the three states of a single indicator saying long, short, or no position. We will utilize this smoother behavior in the context of Anchoring (section 4) and Portfolio construction (section 7) later in this paper.

2 Benchmarking

An important concept in the investment area is benchmarking, for example the comparison of a single stock with respect to its index. In our examples, we study the stock prices of the constituents of the S&P 500 index; hence we would certainly prefer stocks which outperform this index.

Such benchmarking can be performed by ratio charts. A ratio chart is computed by dividing the close price of the stock for each date by the close price of the index (or any other benchmark). The resulting ratio chart series has no candles any more, but only close data. But all trend-following indicators are chosen such, that they can also be computed on a ratio chart.

But is trend-following on a ratio chart a suitable approach? In section 1.2 we discussed the timing effect of the trend-following indicators, we present the results of an analogous analysis for the ratio charts in Figure 7. But there is an important difference to observe! The excess probability of an outperformance to persist is higher – especially for shorter time frames. And with regard to the average return of the outperformance, this is increasingly positive over the long run, hence for two or three months in our study. Hence for trend-following, benchmarking with the index provides a considerable benefit!

So the question rises, how can we join the Trend-Score T_1 of a stock itself with the Trend-Score T_2 of the corresponding ratio chart with respect to an index or another benchmark? The idea is quite simple: For a long trade we prefer stock which are in an up-trend and which also outperform the index. Based on this idea we join the two Trend-Scores to a joint Trend-Score T via

$$T := join(T_1, T_2) := sign(T_1, T_2) \cdot min(abs(T_1), abs(T_2))$$

In this formula, min denotes the minimum of two numbers, abs denotes the absolute value and sign the common sign of the two numbers, hence

$$sign(T_1, T_2) = \begin{cases} 1.0, \text{ if } T_1 > 0 \text{ and } T_2 > 0 \\ -1.0, \text{ if } T_1 < 0 \text{ and } T_2 < 0 \\ 0.0, \text{ else} \end{cases}$$

One can easily extend this approach to more than one benchmark. For example if one requires that the stock should not only outperform the S&P 500 index, but also its sector index.

3 Emotion

3.1 Emotion-Index

On a short term basis, usually less than a month, markets often show a mean-reversion pattern which is founded in the emotions of the investors. If the price of a stock has firmly risen over the previous days, the market participants become (too) optimistic about the company. But since all investors bought already, the price will likely consolidate in the near future.

To measure such emotions by technical analysis, oscillators are used to identify overbought or oversold conditions, which reflect the emotions of investors. In order to be independent of a certain time-horizon or measurement approach, again a set of indicators is used as shown in Figure 2. The indicators are rescaled in such a manner, that their codomain is [-1.0 , 1.0] and a value close to -1.0 represents the oversold state and a value close to 1.0 is linked to the overbought state.

The two chosen kinds of oscillators differ in some aspects, so that they complement each other:

- The RSI (Relative Strength Index by Welles Wilder) is calculated on Close data only, but the order of the quotes is essential.
- The Candle Range uses the High and Low of a certain timespan, but the order of the candles in the past is not relevant for the calculation.

rescaled RSI	• Using 2.0*RSI - 1.0, hence rescale the classical RSI to a codomain of -1.0 to 1.0 • Parameters used are: 5, 8, 11, 14, 17, 20
rescaled CandleRange	• Compute the current close C in relation to the high H_n and low L_n of the last n candles by $2.0\frac{C-L_n}{H_n-L_n} - 1.0$ • Values for n are: 3, 6, 9, 12, 15, 18

Figure 2: Overview of the twelve basic oscillators used

Following the lines of the construction of the Trend-Score, we average the twelve oscillators into the Emotion-Index and the resulting value is in the range from -1.0 to 1.0. Again we avoid to rely on a particular specification of one certain indicator or time-frame:

$$EmotionIndex = \frac{1}{12}\sum_{i=1}^{12} Oscillator_i$$

To study the predictive properties of the Emotion-Index, we evaluate the Emotion-Index for each stock and date and round the Emotion-Index to the nearest integer multiple of 0.1. The win-probability and the average log return for several time stops are presented in Figure 8. As one can see, the probability for a stock to rise increases for smaller values of the Emotion-Index. This holds for all time-frames, but is even stronger on the shorter ones.

This general anti-cyclical effect also holds for the average log-returns. The lower the value of the Emotion-Index is, the higher is the average return for a fixed-time frame. This data analysis showed clearly, that there is indeed a short-term anti-cyclical pattern in the stock market.

3.2 Understanding the worse timing of trend-following

This short term anti-cyclical pattern in the stock-market can also help to understand the worse timing of the trend-following indicators shown in section 1.2. Even if trend-following works on the long run, the trend-following buy- or sell-signals occur in situations, where the stock is usually overbought or oversold. Hence the short term anti-cyclical price movements overlay the longer-term trend-following pro-cyclical price pattern. This provides the reasoning of the bad timing of trend-following approaches

This also explains the small win probabilities for any trend-following strategy in general: The trend-following signal for a long-position occurs in an overbought situation and hence a pullback is quite likely. And if this pullback happens just after the trend-signal was triggered, the exit signal might promptly be triggered. Therefore, the entry on a trend-following signal provides no advantage in conjunction with a time-stop.

A closer look to the trend-following signals in Figure 5 showed, that the signals based on linear regression or long-term cross-over signals were not as bad as

the other ones. This can also be explained by this emotion-driven behavior of the markets too: These indicators are less influenced by the recent price data and their signals are more stable in the presence of a short-term counter-move of the stock.

Also the effect of benchmarking and trending can be understood by this emotional effect. Since a single stock is likely overbought or oversold if also the index is overbought/sold, the ratio chart is smoother and the anti-cyclical effect is therefore reduced on a ratio chart. This holds even more for the longer-term trend-following indicators as shown in Figure 7.

3.3 Emotion and Benchmarking

Should we consider benchmarking for the Emotion-Index too? The short answer is just: “No”.

Most market participants are emotionally driven by their nominal P&L, and this is the most dominant effect for the emotions of the market participants. Even if an investment manager is compared to the index, he or she would certainly not party on an outperformance with respect to the index, because this performance will undermine the assets under management. At least I haven’t heard someone saying: “I am very excited on my x% loss on some stock, because it outperformed the index”

4 Anchoring

We learned that the short-term emotional behavior in the market offsets any trend-following approach. To overcome this issue, an anchoring is proposed. The idea behind this anchoring is quite simple: It is a wise advise in general not to decide on something, while you are too emotionally involved in a matter. Applying this concept to the Trend-Score, we should not validate it in a highly emotional state. Hence we should decide on the trend only, when the Emotion-Index is close to zero. For practical purposes, the Trend-Score is evaluated whenever the Emotion-Index changes its sign – and the Anchored-Trend-Score remains constant otherwise. Hence this Anchored-Trend-Score is anchored to times with least emotional sentiment, or while the market-participants have the most rational view on the markets.

We use the same approach as before to test the anchored trend signals, where the Anchored-Trend-Score is also based on benchmarking with respect to the S&P500 index. The results are shown in Figure 9. Clearly, for each time stop maturity, as well the hit probability as the average log-return is increasing with the anchored trend. Hence a higher value of the anchored trend provides an essential statistical advantage for positive stock price returns.

5 Timing

A general advise for active investment is to look for a correction in an existing trend. This approach can be utilized with the indicators presented so far. For a long position, one would like to have an uptrend, hence a rather high Anchored-Trend-Score, and at the same time also an oversold condition, hence a rather negative Emotion-Index. Therefore we introduce the Timing-Indicator as the difference of the Anchored-Trend-Score and the Emotion:

$$TimingIndicator = AnchoredTrendScore - EmotionIndex$$

The codomain for the Timing-Indicator is clearly given by -2.0 to 2.0. A good timing value for a long position is above 1.0 and a good timing value for a short position is below -1.0. This is statistically validated in Figure 10, again as well for the win probability as for the average log-return and is valid for all considered timeframes.

For an active investor, sorting the stocks by the value of the Timing-Indicator helps to find interesting swing trading candidates – as well on the long as on the short side. On one side of the list you find oversold stocks in an up-trend, and on the other side there are the overbought stocks in a down-trend.

6 Charting

So far we introduced the Trend-Score (Plain and Anchored, possibly with benchmarking), the Emotion-Index and the Timing-Indicator. How to present all this information in one chart? Following the idea, that there is not a stock market, but a market of stocks, we can plot each stock in the two-dimensional plane: The x-coordinate is the Anchored-Trend-Score and the y-coordinate is the Emotion-Index.

To illustrate the idea, a chart based on the Dow-Jones-Industrial-Average constituents is shown in Figure 3. Each stock is represented by an anchor (to remind to the anchored trend) with the ring representing the actual position. Attached to the ring there is a horizontal line (rope), pointing to the current position of the Trend-Score, hence showing the position of the current Trend-Score. The size of the stock of the anchor represents the minimum movement of the Trend-Score to the left or right, hence representing the size of 2 * 1/40. Below the stock of each anchor, the ticker symbol of the stock is printed.

The red shared area represents the area of down-trends (Anchored-Trend-Score $<-\frac{1}{3}$) and the green area the area of up-trends (Anchored-Trend-Score $> \frac{1}{3}$). The two golden lines represents the line where the timing indicator is either -1.0 (in the top left section) or 1.0 (in the bottom right section).

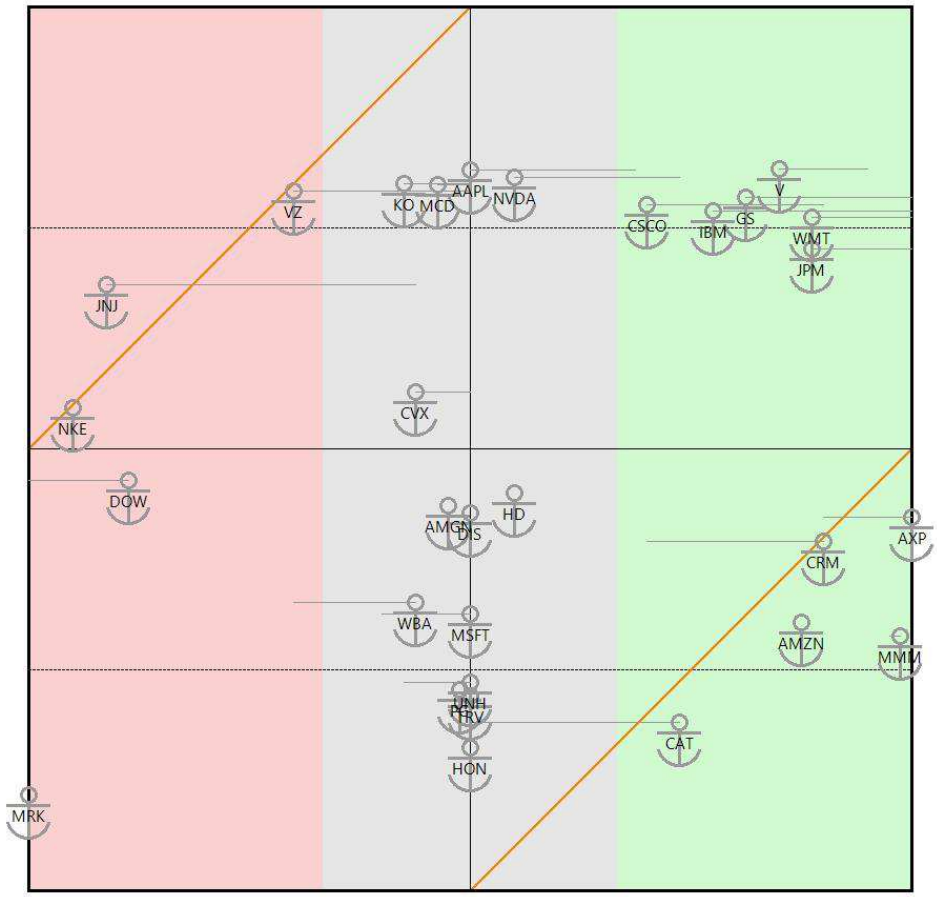

Figure 3: Trend-Emotion-Timing-Chart of the Dow constituents (Feb 14, 2025)

We explain the proposed representation by the example in Figure 3: In this chart, the stocks of JNJ, NKE, VZ might be good candidates to short (overbought in a down-trend). There are in total eleven stocks in a clear uptrend (green area), of which six are overbought and hence an active investor would trim these positions (CSCO, IBM, GS, V, WMT, JPM). And there are five stocks in the lower right triangle which indicates good buying opportunities (CRM, CAT, AMZN, MMM, AXP). Of these five positions, there is a warning on CRM and CAT: These anchors have a long line to the left, indicating that the current trend score is much weaker than the anchored trend. An active

investor aiming for only a few buying opportunities would therefore favor AXP, AMZN and MMM in the provided example.

There are lots of anchors at or close to the vertical no-trend-line in the mid. This is the effect of the benchmarking with the Dow Jones Industrial Average index. Hence these are the stocks, which have an up-trend ($\text{Trend-Score} \geq 0.0$), but the ratio chart of the stock compared to the index has a negative (or zero) Trend-Score. Hence these are the boring stocks from a trend-follower's point of view.

7 Portfolio construction

The previous approach provides by one chart an overview of rewarding investment ideas. Now we aim to construct a portfolio composition quantitatively. In the classical portfolio theory based on the famous work of the Nobel laureates Harry Markowitz and William Sharpe, there is a big challenge to estimate the expected return of a stock. Any classical trend-following return estimation fails in this respect due to the negative effect of the pro-cyclical signal generation. We can now overcome this issue based on the Anchored-Trend-Score.

7.1 Estimation of the equity return

We have already shown the positive correlation between Anchored-Trend-Score and future returns of a stock and that this indicator overcomes the pro-cyclical market behavior due to the mean-reversion behavior of prices on a short time frame by construction. So this is one factor to consider for the return estimation.

Given two stock with the same Anchored-Trend-Score, but one of these stocks is more volatile, one would expect a higher return on the more volatile stock. To estimate the volatility, we advise to use the historical volatility since it is less erratic than the implied volatility; and the historical volatility is also available for equities without (a liquid) option market. So as a rule of thumb, the return of a stock for portfolio optimization could be estimated by

$$Return \approx Volatility \cdot AnchoredTrendScore$$

Hence the size of the return is proportional to the volatility of the stock, but also the Anchored-Trend-Score is involved: By this construction the return estimation is not pro-cyclical anymore and the estimated return is negative in down-trends. Furthermore, also the consideration of benchmarks (e.g. the S&P 500 index) can be utilized in this definition as explained earlier. And by using the historical volatility and the Anchored-Trend-Score, only price information is used to estimate the return – a very unbiased approach for an active investor.

7.2 Realigning the Portfolio Optimization

To construct an optimized portfolio similar to the classical portfolio theory, we are searching for the portfolio weights w_i with the boundary condition $\sum_{i=1}^{N} w_i = 1.0$ and we avoid short-selling by imposing $w_i \geq 0$. The return R_i of each stock is given by the product of the volatility and its Anchored-Trend-Score. Note that the Anchored-Trend-Score can consider any benchmarks, including a benchmark based on a risk-free interest rate. Therefore the return should be interpreted as excess return and the objective function to optimize is similar to the Sharpe ratio, note that there is no subtraction of the risk-free rate in the nominator any more:

$$T(\omega) = \frac{\sum_{i=1}^{N} \omega_i R_i}{Risk(\omega)}$$

This approach facilitates the usage of any risk measure (e.g. the expected shortfall), for the purpose of a simple demonstration we will use the standard derivation in this paper, where C denotes the covariance matrix of the stocks and the portfolio risk is hence given by:

$$Risk(\omega) = \sqrt{\sum_{i=i}^{N} \sum_{j=1}^{N} C_{i\,j}\, \omega_i\, \omega_j}$$

The optimization of $T(\omega)$ under the constraints on ω is a well-formed problem: A linear optimization over a convex set. There are several approaches to solve this problem, for example this can be achieved by a Simulated Annealing.

7.3 Example

To illustrate the optimal portfolio composition we perform this optimization for a portfolio of stocks in the Dow-Jones based on the example presented in section 6. Since we only like stocks with a positive Anchored-Trend-Score, the selection of instruments is reduced and the optimal weights are shown in the last column in Figure 4. To perform the risk measurement by the estimated volatility of the portfolio, the correlations of the stocks on a weekly basis over the last year have been utilized to build the covariance matrix.

Ticker	Anchored Trend	Volatility	Est. Return	Weight
AXP	100%	26,6%	26,6%	10,7%
MMM	98%	34,3%	33,4%	17,0%
CRM	80%	42,1%	33,7%	9,5%
JPM	78%	26,7%	20,7%	8,3%
WMT	78%	20,4%	15,8%	22,9%
AMZN	75%	31,0%	23,2%	18,4%
V	70%	18,8%	13,2%	13,2%
GS	63%	29,6%	18,5%	0,0%
IBM	55%	28,4%	15,6%	0,0%
CAT	48%	30,0%	14,2%	0,0%
CSCO	40%	20,1%	8,0%	0,0%
HD	10%	22,7%	2,3%	0,0%
NVDA	10%	61,8%	6,2%	0,0%
Optimized Portfolio		**15,4%**	**21,3%**	**100,0%**

Figure 4: Example of an optimal portfolio of Dow Jones stocks

The result of the optimization shows that the optimal portfolio has a reduced volatility compared to each stock and an estimated return higher than the average. That is the usual result of any mathematical portfolio optimization. This example also shows, that stocks with a quite low Anchored Trend, hence a low estimated Return by this approach, will not be included in the optimized portfolio – only the stocks in the green area of Figure 3 has been selected into the portfolio in this example!

This is the optimized portfolio for an trend-following investor who avoids the short-term disadvantages of the pro-cyclical signals of trend-following indicators, since the Anchoring is an essential part of this enhancement of the classical portfolio theory.

8 Conclusion

The first novel idea of this paper is to overcome choosing a precise time-horizon in the calculation of the Trend-Score or the Emotion-Index by averaging over a set of established trend-following indicators or oscillators using several time-frames. It's not about getting the right indicator for the correct time-frame any more, but the general behavior of the market: Short term movements up to a month are more likely mean-reverting, while medium term movements from a month up to two years are leaning more to keep their

momentum. This general pattern of the stock market is confirmed by statistics based on a ten year history of the constituents of the S&P 500. Furthermore is shown in the paper that benchmarking contributes essentially to trend-following strategies, hence the benchmarking is also covered in the computation of the Trend-Score.

The antagonism of emotion and trend yields to the second finding: For trend-following we could affirm that anchoring the trend to a less emotional time in the market gives an additional edge – hence the Anchored-Trend-Score is established. The discussed opposition of trend and emotion is mathematical expressed in the Timing-Indicator, which is *trend minus emotion*.

To complement the paper, two applications of the discussed indicators are presented. A novel charting is proposed to overview the stocks of a market, by plotting each stock on a [-1 to 1] x [-1 to 1] square. Only one glance is needed to identify the trending stocks, or the stocks being overbought or oversold. Additionally, two diagonal lines mark the area of stocks having an interesting setup from a timing perspective, which could be utilized for swing-trading. The presentation of the Timing-Indicator establishes also the opportunity for further research, e.g. the development and backtest of a precise trading strategy which is based on it.

Another application of the Anchored-Trend-Score persists in the estimation of the return of a stock, together with its volatility. Since classical approaches of trend-following portfolio constructions suffer from the pro-cyclical signaling of trend-following indicators, the Anchored-Trend-Score can overcome this issue. The well-known portfolio optimization can easily be extended to this approach. We constructed a trend-following portfolio optimization without being negatively exposed to the short-term, emotionally driven price action of the market. This approach to optimize a portfolio can easily be adapted to more advanced measures of risk e.g. the Value-at-Risk used for regulatory purposes, or the (coherent risk measure) Expected Shortfall.

This paper demonstrates two essential drivers of the stock market: The short-term Emotion and the medium-term Trend and the paper establishes tools to overcome their antagonism. It proposes a novel graphical overview for an active discretionary investor and provides a coherent portfolio construction for the quantitative investment manager.

9 Appendix Statistical data

9.1 Trend with time stop

Indicator	Exxcess Probability						Exxcess (log) Return					
Time stop horizon	1 w	2 w	3 w	1 m	2 m	3 m	1 w	2 w	3 w	1 m	2 m	3 m
RoC(24)	-0,6%	-1,4%	-1,6%	-2,3%	-3,1%	-3,1%	-0,1%	-0,2%	-0,3%	-0,7%	-1,3%	-1,4%
RoC(32)	-1,3%	-1,9%	-2,1%	-2,6%	-3,0%	-3,4%	-0,1%	-0,3%	-0,4%	-0,8%	-1,4%	-1,5%
RoC(48)	-1,3%	-2,3%	-2,5%	-2,9%	-3,2%	-3,2%	-0,2%	-0,3%	-0,6%	-1,0%	-1,4%	-1,7%
RoC(64)	-0,9%	-2,1%	-1,9%	-2,3%	-3,0%	-2,3%	-0,2%	-0,4%	-0,5%	-0,8%	-1,4%	-1,4%
RoC(96)	-1,4%	-2,3%	-2,0%	-2,1%	-2,1%	-2,0%	-0,2%	-0,3%	-0,5%	-0,8%	-1,1%	-1,1%
RoC(128)	0,0%	-1,1%	-1,0%	-1,5%	-2,0%	-1,4%	-0,1%	-0,2%	-0,4%	-0,6%	-0,9%	-0,8%
RoC(192)	0,2%	-0,5%	-0,1%	-0,5%	-0,8%	-1,1%	-0,1%	-0,2%	-0,3%	-0,5%	-0,7%	-0,8%
RoC(256)	0,1%	-0,6%	-0,7%	-1,5%	-2,2%	-3,3%	-0,1%	-0,2%	-0,4%	-0,6%	-1,1%	-1,6%
RoC(384)	0,1%	-0,7%	-0,8%	-1,8%	-3,0%	-3,7%	-0,1%	-0,3%	-0,4%	-0,7%	-1,2%	-1,6%
RoC(512)	-0,1%	-0,7%	-1,0%	-2,2%	-3,7%	-4,3%	-0,2%	-0,3%	-0,5%	-0,8%	-1,4%	-1,8%
SMA(24)	-0,8%	-1,2%	-1,0%	-2,0%	-3,3%	-3,1%	-0,1%	-0,1%	-0,3%	-0,6%	-1,4%	-1,6%
SMA(32)	-1,0%	-1,6%	-1,5%	-2,5%	-3,5%	-3,5%	-0,1%	-0,2%	-0,4%	-0,7%	-1,6%	-1,7%
SMA(48)	-1,0%	-1,7%	-1,8%	-2,8%	-3,5%	-3,7%	-0,1%	-0,2%	-0,5%	-0,9%	-1,6%	-1,8%
SMA(64)	-1,1%	-2,0%	-2,1%	-3,0%	-3,6%	-3,6%	-0,2%	-0,3%	-0,6%	-1,0%	-1,7%	-1,9%
SMA(96)	-1,2%	-2,3%	-2,4%	-3,0%	-3,4%	-3,0%	-0,2%	-0,4%	-0,6%	-1,0%	-1,6%	-1,7%
SMA(128)	-0,9%	-2,0%	-1,9%	-2,3%	-2,9%	-2,5%	-0,1%	-0,3%	-0,5%	-0,9%	-1,4%	-1,4%
SMA(192)	-0,4%	-1,4%	-1,2%	-1,6%	-2,0%	-1,9%	-0,1%	-0,3%	-0,4%	-0,7%	-1,1%	-1,2%
SMA(256)	-0,1%	-1,1%	-0,9%	-1,4%	-1,7%	-1,9%	-0,1%	-0,2%	-0,4%	-0,6%	-1,0%	-1,2%
SMA(384)	-0,3%	-1,3%	-1,3%	-2,1%	-2,6%	-3,0%	-0,1%	-0,3%	-0,5%	-0,8%	-1,2%	-1,5%
SMA(512)	-0,3%	-1,4%	-1,5%	-2,6%	-3,4%	-3,8%	-0,2%	-0,4%	-0,6%	-0,9%	-1,4%	-1,7%
Crossover(20, 400)	-0,3%	-1,2%	-1,2%	-1,8%	-2,2%	-2,5%	-0,2%	-0,3%	-0,5%	-0,7%	-1,0%	-1,2%
Crossover(50, 400)	0,1%	-0,4%	-0,3%	-0,9%	-1,4%	-1,8%	-0,1%	-0,2%	-0,4%	-0,5%	-0,7%	-1,0%
Crossover(100, 400)	0,6%	0,5%	0,5%	-0,1%	-1,0%	-1,6%	-0,1%	-0,1%	-0,2%	-0,3%	-0,6%	-0,8%
Crossover(200, 400)	0,7%	0,5%	0,2%	-0,6%	-1,8%	-3,1%	-0,1%	-0,2%	-0,3%	-0,4%	-0,8%	-1,2%
Crossover(20, 200)	-0,6%	-1,7%	-1,6%	-1,8%	-1,6%	-1,5%	-0,2%	-0,3%	-0,5%	-0,7%	-0,9%	-0,9%
Crossover(50, 200)	-0,3%	-0,9%	-0,6%	-0,8%	-1,1%	-0,4%	-0,1%	-0,3%	-0,4%	-0,5%	-0,6%	-0,4%
Crossover(100, 200)	0,3%	0,1%	0,5%	0,5%	0,3%	0,7%	-0,1%	-0,1%	-0,1%	-0,1%	-0,1%	0,1%
Crossover(20, 100)	-1,3%	-2,8%	-2,9%	-3,2%	-2,5%	-2,2%	-0,2%	-0,4%	-0,7%	-1,0%	-1,3%	-1,2%
Crossover(50, 100)	-1,0%	-1,9%	-1,7%	-1,7%	-1,7%	-0,7%	-0,2%	-0,4%	-0,5%	-0,7%	-0,9%	-0,7%
Crossover(20, 50)	-1,1%	-2,5%	-2,9%	-3,5%	-3,0%	-3,2%	-0,1%	-0,4%	-0,6%	-1,0%	-1,4%	-1,5%
LinearReg(3)	-1,7%	-3,1%	-3,2%	-3,4%	-3,2%	-2,7%	-0,3%	-0,5%	-0,8%	-1,1%	-1,5%	-1,5%
LinearReg(4)	-1,3%	-2,5%	-2,5%	-2,8%	-2,5%	-1,5%	-0,2%	-0,4%	-0,6%	-0,9%	-1,3%	-1,1%
LinearReg(5)	-1,2%	-2,2%	-1,9%	-1,9%	-1,7%	-0,9%	-0,2%	-0,4%	-0,6%	-0,7%	-0,9%	-0,7%
LinearReg(6)	-0,4%	-1,3%	-1,0%	-1,1%	-1,4%	-0,5%	-0,2%	-0,3%	-0,4%	-0,6%	-0,7%	-0,4%
LinearReg(7)	-0,5%	-1,3%	-1,1%	-1,1%	-1,0%	-0,1%	-0,2%	-0,3%	-0,4%	-0,5%	-0,4%	-0,2%
LinearReg(8)	-0,1%	-0,7%	-0,3%	-0,3%	-0,3%	0,3%	-0,1%	-0,2%	-0,2%	-0,3%	-0,3%	-0,1%
LinearReg(9)	0,2%	-0,2%	0,2%	0,0%	-0,1%	0,3%	-0,1%	-0,2%	-0,2%	-0,3%	-0,3%	-0,2%
LinearReg(12)	0,6%	0,5%	0,7%	0,2%	-0,4%	-1,1%	-0,1%	-0,1%	-0,2%	-0,2%	-0,4%	-0,7%
LinearReg(15)	0,4%	0,1%	-0,1%	-0,8%	-1,8%	-2,8%	-0,1%	-0,2%	-0,3%	-0,5%	-0,9%	-1,3%
LinearReg(18)	0,6%	0,2%	0,0%	-0,9%	-2,0%	-3,1%	-0,1%	-0,2%	-0,3%	-0,5%	-0,9%	-1,3%

Figure 5: Excess profit probability and log-return of trend-following indicators

9.2 Pure Trend-following

Indicator	Win probability	Avg. log return
RoC(24)	36,3%	0,3%
RoC(32)	35,6%	0,3%
RoC(48)	36,7%	0,4%
RoC(64)	35,3%	0,4%
RoC(96)	33,6%	0,5%
RoC(128)	35,4%	0,9%
RoC(192)	34,9%	1,1%
RoC(256)	34,4%	1,2%
RoC(384)	33,9%	1,4%
RoC(512)	33,7%	1,6%
SMA(24)	35,1%	0,2%
SMA(32)	33,7%	0,3%
SMA(48)	31,6%	0,3%
SMA(64)	29,9%	0,4%
SMA(96)	28,1%	0,4%
SMA(128)	26,8%	0,6%
SMA(192)	25,5%	0,9%
SMA(256)	25,0%	1,1%
SMA(384)	23,4%	1,2%
SMA(512)	22,3%	1,3%
Crossover(20, 400)	33,3%	4,1%
Crossover(50, 400)	42,4%	6,7%
Crossover(100, 400)	50,3%	10,0%
Crossover(200, 400)	53,8%	11,4%
Crossover(20, 200)	35,9%	2,9%
Crossover(50, 200)	43,3%	4,3%
Crossover(100, 200)	51,3%	6,2%
Crossover(20, 100)	38,6%	1,6%
Crossover(50, 100)	44,1%	1,9%
Crossover(20, 50)	43,0%	1,2%
LinearReg(3)	39,9%	0,9%
LinearReg(4)	42,1%	1,6%
LinearReg(5)	42,3%	2,1%
LinearReg(6)	43,6%	3,2%
LinearReg(7)	44,4%	3,7%
LinearReg(8)	46,7%	4,9%
LinearReg(9)	47,3%	6,1%
LinearReg(12)	50,2%	8,6%
LinearReg(15)	49,0%	8,8%
LinearReg(18)	50,7%	11,0%

Figure 6: A simple long-only trend-following strategy for several indicators

9.3 Ratio-Trend – Benchmarking with Index

Indicator	Exxcess Probability							Exxcess (log) Return					
Time stop horizon	1 w	2 w	3 w	1 m	2 m	3 m		1 w	2 w	3 w	1 m	2 m	3 m
RoC(24)	-0,3%	-0,6%	-0,7%	-1,1%	-1,1%	-0,9%		0,0%	-0,1%	-0,1%	-0,2%	-0,3%	-0,2%
RoC(32)	-0,3%	-0,4%	-0,3%	-0,7%	-1,1%	-0,7%		0,0%	0,0%	-0,1%	-0,2%	-0,3%	-0,1%
RoC(48)	0,0%	-0,1%	-0,2%	-0,7%	-0,3%	-0,1%		0,0%	0,0%	-0,1%	-0,2%	-0,1%	0,0%
RoC(64)	0,0%	-0,2%	-0,1%	-0,2%	-0,3%	0,2%		0,0%	0,0%	0,0%	-0,1%	0,0%	0,2%
RoC(96)	0,3%	0,1%	0,2%	0,1%	0,5%	0,5%		0,0%	0,0%	0,0%	0,0%	0,2%	0,3%
RoC(128)	1,3%	1,2%	1,3%	1,0%	0,9%	0,7%		0,1%	0,1%	0,1%	0,1%	0,3%	0,4%
RoC(192)	1,2%	1,0%	1,1%	1,0%	1,2%	1,0%		0,0%	0,1%	0,1%	0,2%	0,4%	0,6%
RoC(256)	1,4%	1,2%	1,1%	1,0%	0,4%	0,0%		0,0%	0,1%	0,1%	0,2%	0,3%	0,4%
RoC(384)	1,6%	1,5%	1,5%	1,2%	0,6%	0,3%		0,0%	0,1%	0,1%	0,1%	0,3%	0,4%
RoC(512)	1,6%	1,6%	1,6%	1,3%	0,5%	0,0%		0,0%	0,1%	0,1%	0,1%	0,1%	0,2%
SMA(24)	-0,5%	-0,6%	-0,5%	-1,0%	-1,0%	-0,9%		0,0%	-0,1%	-0,1%	-0,2%	-0,3%	-0,3%
SMA(32)	-0,4%	-0,5%	-0,5%	-1,0%	-1,1%	-0,9%		0,0%	-0,1%	-0,1%	-0,2%	-0,3%	-0,2%
SMA(48)	-0,2%	-0,3%	-0,3%	-0,9%	-1,1%	-0,7%		0,0%	-0,1%	-0,1%	-0,2%	-0,3%	-0,1%
SMA(64)	-0,1%	-0,3%	-0,3%	-0,8%	-0,8%	-0,4%		0,0%	-0,1%	-0,1%	-0,2%	-0,2%	-0,1%
SMA(96)	0,1%	-0,1%	0,0%	-0,4%	-0,1%	0,3%		0,0%	0,0%	0,0%	-0,1%	0,0%	0,2%
SMA(128)	0,3%	0,2%	0,3%	0,1%	0,4%	0,5%		0,0%	0,0%	0,0%	0,0%	0,1%	0,3%
SMA(192)	0,8%	0,7%	0,7%	0,6%	0,7%	0,6%		0,0%	0,1%	0,1%	0,1%	0,3%	0,4%
SMA(256)	1,2%	1,1%	1,1%	1,0%	0,9%	0,6%		0,0%	0,1%	0,1%	0,2%	0,3%	0,5%
SMA(384)	1,4%	1,2%	1,3%	1,2%	1,1%	0,8%		0,0%	0,1%	0,1%	0,2%	0,4%	0,5%
SMA(512)	1,5%	1,4%	1,4%	1,1%	0,9%	0,6%		0,0%	0,1%	0,1%	0,2%	0,3%	0,5%
Crossover(20, 400)	1,7%	1,5%	1,5%	1,3%	1,1%	0,9%		0,1%	0,1%	0,2%	0,2%	0,4%	0,6%
Crossover(50, 400)	1,8%	1,5%	1,5%	1,3%	0,9%	0,9%		0,1%	0,1%	0,2%	0,2%	0,4%	0,6%
Crossover(100, 400)	1,7%	1,4%	1,3%	1,2%	0,7%	0,5%		0,1%	0,1%	0,1%	0,2%	0,4%	0,5%
Crossover(200, 400)	1,6%	1,3%	1,3%	1,1%	0,3%	0,1%		0,0%	0,1%	0,1%	0,2%	0,3%	0,4%
Crossover(20, 200)	1,0%	0,9%	0,9%	0,8%	0,9%	0,7%		0,0%	0,1%	0,1%	0,1%	0,3%	0,5%
Crossover(50, 200)	1,3%	1,2%	1,2%	1,1%	1,0%	0,8%		0,1%	0,1%	0,1%	0,2%	0,4%	0,5%
Crossover(100, 200)	1,3%	1,2%	1,2%	1,1%	1,1%	0,5%		0,0%	0,1%	0,1%	0,2%	0,4%	0,4%
Crossover(20, 100)	0,1%	-0,1%	-0,2%	-0,4%	0,3%	0,7%		0,0%	0,0%	0,0%	0,0%	0,1%	0,3%
Crossover(50, 100)	0,5%	0,4%	0,4%	0,4%	0,7%	0,9%		0,0%	0,0%	0,1%	0,1%	0,3%	0,4%
Crossover(20, 50)	-0,2%	-0,5%	-0,6%	-1,1%	-0,5%	-0,2%		0,0%	-0,1%	-0,1%	-0,2%	-0,2%	0,0%
LinearReg(3)	-0,2%	-0,5%	-0,5%	-0,6%	0,0%	0,4%		0,0%	-0,1%	-0,1%	-0,1%	0,0%	0,2%
LinearReg(4)	0,4%	0,3%	0,2%	0,1%	0,3%	0,8%		0,0%	0,0%	0,0%	0,0%	0,2%	0,4%
LinearReg(5)	0,6%	0,5%	0,5%	0,5%	0,8%	0,8%		0,0%	0,1%	0,1%	0,1%	0,3%	0,4%
LinearReg(6)	1,2%	1,1%	1,2%	1,1%	1,0%	0,8%		0,0%	0,1%	0,1%	0,2%	0,3%	0,5%
LinearReg(7)	1,4%	1,3%	1,3%	1,1%	1,0%	0,8%		0,1%	0,1%	0,1%	0,2%	0,3%	0,5%
LinearReg(8)	1,4%	1,3%	1,3%	1,1%	1,0%	0,7%		0,1%	0,1%	0,1%	0,2%	0,4%	0,5%
LinearReg(9)	1,4%	1,3%	1,2%	1,1%	1,1%	0,7%		0,0%	0,1%	0,1%	0,2%	0,4%	0,5%
LinearReg(12)	1,6%	1,3%	1,2%	1,1%	0,6%	0,0%		0,1%	0,1%	0,2%	0,2%	0,4%	0,5%
LinearReg(15)	1,6%	1,2%	1,2%	0,9%	0,1%	-0,2%		0,0%	0,1%	0,1%	0,1%	0,3%	0,4%
LinearReg(18)	1,7%	1,5%	1,5%	1,3%	0,5%	0,4%		0,0%	0,1%	0,1%	0,2%	0,3%	0,4%

Figure 7: Excess profit probability and excess log-return of several trend-following indicators applied to the ratio chart (benchmarking)

9.4 Emotions and time stop

Emotion	Profit Probability							Average (log) Return					
Time stop horizon	1 w	2 w	3 w	1 m	2 m	3 m		1 w	2 w	3 w	1 m	2 m	3 m
-1,0	89%	78%	81%	84%	84%	81%		3,0%	3,6%	5,8%	8,7%	11%	8,9%
-0,9	61%	61%	62%	62%	63%	66%		0,4%	0,1%	0,4%	1,5%	3,2%	5,7%
-0,8	56%	57%	57%	58%	61%	63%		0,3%	0,1%	0,1%	0,9%	2,4%	3,9%
-0,7	55%	57%	57%	57%	61%	62%		0,2%	0,4%	0,5%	1,0%	2,4%	3,6%
-0,6	55%	56%	56%	57%	60%	62%		0,3%	0,5%	0,7%	1,1%	2,3%	3,3%
-0,5	55%	56%	56%	57%	60%	61%		0,3%	0,4%	0,7%	1,0%	2,2%	3,1%
-0,4	55%	56%	57%	57%	60%	61%		0,3%	0,5%	0,7%	1,1%	2,1%	3,0%
-0,3	55%	56%	56%	57%	59%	61%		0,3%	0,4%	0,7%	1,0%	1,9%	2,8%
-0,2	54%	55%	56%	56%	59%	60%		0,2%	0,4%	0,6%	0,9%	1,8%	2,5%
-0,1	54%	55%	56%	57%	59%	60%		0,2%	0,4%	0,6%	0,9%	1,7%	2,4%
0,0	54%	55%	56%	56%	58%	60%		0,2%	0,4%	0,6%	0,8%	1,6%	2,2%
0,1	54%	55%	56%	56%	58%	60%		0,2%	0,4%	0,5%	0,8%	1,5%	2,0%
0,2	54%	55%	56%	57%	58%	60%		0,2%	0,4%	0,6%	0,8%	1,4%	2,0%
0,3	54%	55%	56%	56%	58%	59%		0,1%	0,3%	0,5%	0,6%	1,2%	1,8%
0,4	54%	55%	56%	56%	58%	59%		0,1%	0,3%	0,4%	0,6%	1,1%	1,8%
0,5	54%	55%	56%	56%	57%	59%		0,1%	0,2%	0,4%	0,5%	0,9%	1,6%
0,6	53%	54%	55%	56%	57%	58%		0,1%	0,2%	0,3%	0,5%	0,7%	1,4%
0,7	53%	55%	55%	55%	56%	58%		0,0%	0,2%	0,2%	0,3%	0,5%	1,2%
0,8	52%	54%	55%	54%	55%	57%		0,0%	0,2%	0,2%	0,1%	0,1%	1,0%
0,9	50%	53%	54%	53%	54%	58%		-0,2%	0,0%	0,1%	-0,2%	-0,3%	0,9%
1,0	41%	44%	47%	53%	57%	56%		-0,6%	-0,7%	-0,1%	-0,1%	-0,8%	-0,2%

Figure 8: Profit probabilities and average log-returns by Emotion

9.5 Anchored-Trend-Score

Anchored Trend Score	Profit Probability							Average (log) Return					
Time stop horizon	1 w	2 w	3 w	1 m	2 m	3 m		1 w	2 w	3 w	1 m	2 m	3 m
-1,0	48%	47%	47%	48%	49%	48%		-0,2%	-0,4%	-0,6%	-0,6%	-0,9%	-1,2%
-0,9	49%	50%	50%	50%	51%	52%		-0,2%	-0,4%	-0,5%	-0,5%	-0,5%	-0,6%
-0,8	52%	52%	52%	52%	54%	54%		0,1%	0,1%	0,1%	0,0%	0,1%	0,0%
-0,7	49%	50%	51%	49%	51%	52%		-0,2%	-0,2%	-0,1%	-0,3%	-0,6%	-0,3%
-0,6	52%	51%	52%	52%	52%	53%		-0,1%	-0,1%	0,0%	-0,2%	-0,2%	0,0%
-0,5	52%	53%	52%	51%	53%	53%		0,0%	0,0%	-0,1%	-0,1%	-0,1%	0,3%
-0,4	53%	52%	52%	52%	53%	54%		0,0%	0,0%	0,0%	-0,1%	0,0%	0,4%
-0,3	53%	53%	53%	52%	54%	55%		0,0%	0,0%	0,1%	0,1%	0,3%	0,5%
-0,2	52%	52%	52%	52%	54%	56%		0,0%	0,0%	0,0%	0,0%	0,5%	0,7%
-0,1	52%	52%	51%	52%	54%	56%		0,0%	0,0%	0,0%	0,1%	0,4%	0,8%
0,0	54%	55%	55%	55%	57%	59%		0,1%	0,2%	0,4%	0,4%	1,0%	1,5%
0,1	55%	56%	56%	56%	57%	57%		0,2%	0,4%	0,6%	0,7%	1,1%	1,5%
0,2	55%	55%	55%	55%	56%	57%		0,2%	0,3%	0,5%	0,8%	1,1%	1,5%
0,3	54%	56%	56%	57%	57%	58%		0,2%	0,4%	0,5%	0,7%	0,9%	1,4%
0,4	53%	54%	54%	54%	55%	57%		0,1%	0,2%	0,3%	0,5%	0,9%	1,4%
0,5	53%	54%	54%	55%	56%	56%		0,2%	0,2%	0,4%	0,6%	0,9%	1,1%
0,6	54%	55%	54%	54%	56%	57%		0,1%	0,3%	0,4%	0,4%	0,9%	1,3%
0,7	54%	54%	55%	55%	57%	59%		0,1%	0,3%	0,5%	0,7%	1,2%	1,8%
0,8	55%	56%	56%	56%	57%	57%		0,3%	0,5%	0,6%	0,7%	1,0%	1,4%
0,9	55%	56%	57%	56%	56%	56%		0,2%	0,4%	0,5%	0,6%	0,8%	1,1%
1,0	57%	58%	59%	58%	58%	60%		0,4%	0,8%	1,0%	1,1%	1,7%	2,2%

Figure 9: Profit probabilities and average log-returns by the anchored trend

9.6 Statistics of the Timing-Indicator

Timing-Indicator	Profit Probability							Average (log) Return					
Time stop horizon	1 w	2 w	3 w	1 m	2 m	3 m		1 w	2 w	3 w	1 m	2 m	3 m
-1,8	50%	54%	54%	55%	55%	57%		-0,3%	0,6%	0,4%	0,3%	-0,6%	-0,5%
-1,7	50%	56%	55%	54%	56%	57%		-0,1%	0,6%	0,5%	0,4%	0,5%	1,2%
-1,6	53%	57%	57%	55%	56%	57%		0,0%	0,6%	0,7%	0,8%	0,9%	1,1%
-1,5	53%	55%	56%	55%	56%	58%		0,1%	0,4%	0,6%	0,6%	0,8%	1,3%
-1,4	53%	55%	56%	56%	57%	59%		0,2%	0,4%	0,7%	0,9%	1,4%	1,9%
-1,3	54%	55%	56%	56%	57%	59%		0,2%	0,4%	0,6%	0,8%	1,3%	1,8%
-1,2	54%	56%	57%	57%	58%	60%		0,2%	0,6%	0,7%	0,9%	1,4%	2,0%
-1,1	54%	56%	56%	56%	57%	60%		0,2%	0,5%	0,6%	0,8%	1,3%	1,9%
-1,0	54%	56%	56%	56%	58%	60%		0,2%	0,5%	0,7%	0,9%	1,4%	2,0%
-0,9	53%	55%	56%	57%	57%	59%		0,2%	0,4%	0,6%	0,8%	1,2%	1,9%
-0,8	54%	55%	56%	56%	57%	59%		0,2%	0,4%	0,6%	0,8%	1,0%	1,7%
-0,7	54%	55%	56%	57%	58%	59%		0,2%	0,4%	0,5%	0,7%	1,1%	1,9%
-0,6	54%	56%	57%	57%	58%	59%		0,2%	0,4%	0,6%	0,9%	1,3%	2,0%
-0,5	54%	56%	57%	57%	58%	60%		0,2%	0,4%	0,6%	0,9%	1,4%	2,1%
-0,4	54%	55%	56%	57%	58%	60%		0,2%	0,3%	0,5%	0,8%	1,3%	2,0%
-0,3	54%	55%	56%	57%	59%	60%		0,1%	0,4%	0,6%	0,8%	1,5%	2,1%
-0,2	54%	55%	56%	57%	59%	60%		0,1%	0,3%	0,5%	0,7%	1,5%	2,1%
-0,1	54%	55%	56%	56%	58%	60%		0,1%	0,3%	0,4%	0,6%	1,4%	1,9%
0,0	54%	55%	55%	56%	58%	59%		0,1%	0,3%	0,5%	0,6%	1,3%	2,0%
0,1	53%	54%	55%	56%	58%	59%		0,1%	0,2%	0,4%	0,6%	1,3%	2,0%
0,2	53%	54%	55%	56%	58%	60%		0,1%	0,1%	0,3%	0,6%	1,3%	2,1%
0,3	54%	54%	55%	56%	58%	60%		0,1%	0,2%	0,3%	0,6%	1,4%	2,2%
0,4	53%	54%	55%	56%	58%	60%		0,1%	0,2%	0,4%	0,6%	1,4%	2,3%
0,5	54%	54%	55%	56%	58%	60%		0,1%	0,2%	0,4%	0,6%	1,4%	2,2%
0,6	54%	56%	56%	57%	58%	60%		0,2%	0,3%	0,5%	0,7%	1,5%	2,3%
0,7	55%	55%	56%	56%	59%	60%		0,1%	0,2%	0,4%	0,7%	1,6%	2,5%
0,8	55%	56%	56%	56%	58%	60%		0,1%	0,2%	0,3%	0,7%	1,5%	2,4%
0,9	56%	56%	57%	57%	59%	61%		0,2%	0,4%	0,6%	0,8%	1,8%	2,8%
1,0	57%	57%	57%	56%	59%	61%		0,3%	0,5%	0,7%	0,9%	1,9%	2,9%
1,1	56%	57%	57%	57%	60%	61%		0,3%	0,5%	0,7%	1,0%	2,1%	3,0%
1,2	57%	58%	58%	58%	60%	61%		0,3%	0,6%	0,8%	1,1%	2,2%	3,2%
1,3	57%	58%	58%	58%	60%	62%		0,3%	0,6%	0,8%	1,2%	2,3%	3,5%
1,4	58%	59%	59%	59%	61%	62%		0,4%	0,7%	0,9%	1,3%	2,3%	3,6%
1,5	57%	59%	59%	59%	61%	63%		0,3%	0,7%	0,9%	1,3%	2,6%	3,7%
1,6	57%	59%	59%	59%	60%	63%		0,4%	0,8%	0,8%	1,2%	2,6%	3,5%
1,7	59%	60%	61%	61%	62%	65%		0,8%	0,8%	0,6%	1,3%	2,9%	4,6%
1,8	63%	59%	61%	57%	62%	67%		0,9%	0,7%	0,6%	1,2%	3,5%	5,6%

Figure 10: Profit Probabilities and average (log) return of a rising stock depending on the Timing-Indicator