(B)eating the AEX

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In this report, we try to construct a portfolio that will beat the AEX index. In the first section we will discuss the proposed theory by Grinold (1994). Using his theory, the portfolio will be constructed based on alphas. In the second section we construct a portfolio based on a combination of the affect theory, the self-fulfilling prophecy, and our intuition.

I. Alphas portfolio

The paper of Grinold (1994) states that alpha is the key to investment success. The alphas of the stocks of a portfolio are used to determine the adjusted returns for the specific stocks. Grinold (1994) states that alpha consists of three components: volatility of the return, an information coefficient (IC; a measure of the manager's skill of forecasting), and a score (+1 for a buy advice, -1 for a sell advice). This leads to the following formula:

$$\text{Alpha} = \text{Volatility} \times \text{IC} \times \text{Score} \quad (1)$$

A. Volatility

The volatility represents the residual volatility of a stock (Grinold 1994). He found out that the residual volatility averages about 70% of total volatility. Therefore, we calculated the volatility of each stock by taking 70% of the standard deviation as the residual volatility. Oil companies form an exception, their residual volatility is approximately 80% of their total volatility. Therefore, in our portfolio the residual volatility of oil companies is 80% of the total volatility.

B. Information Coefficient

The information coefficient is a measure of forecasting skill. Grinold (1994) states that a reasonable IC for an outstanding (top 5%) manager forecasting the returns on 500 stocks is about 0.06, and a reasonable IC for a good (top quartile) manager is 0.04. For the determination of the IC, we have used several papers about analyst recommendations and our intuition.

The formula used by Grinold (1994) for calculating the IC is:

$$\text{IC} = \text{IR} / \sqrt{(\text{N})} \quad (2)$$

Where IR stands for information ratio, which is 1.33 for a truly outstanding manager (corresponding to a t-statistic of 3.0 over five years), 0.90 for a top quartile manager (a t-statistic of 2.0 over five years), and 0.44 for a passable manager (a t-statistic of 1.0 over five years). The N stands for the amount of stocks a manager has to predict.

In his examples, Grinold (1994) used an N of 500. In combination with the IRs of 1.33, 0.90, and 0.44, this leads to the ICs stated in the first paragraph of this subsection. We think it is unrealistic that an analyst tracks 500 stocks thoroughly. Based on our intuition we think that an analyst can track 100 stocks, and therefore adjust the N to 100. This results in an IC of 0.13 for top managers, 0.09 for top quartile managers, and 0.04 for passable managers.

Barber, Lehavy, McNichols, and Trueman (2001) show that purchasing stocks with the most favorable consensus recommendations, yield annual gross returns of 4.13% in the period of 1986 to 1996 after controlling for market risk, size, book-to-market, and price momentum effects. This abnormal gross return is the case with daily rebalancing of the portfolio. Consequently, a strategy of purchasing stocks that are most highly recommended by security analysts and selling short those that are least favorably recommended yields a return, in absence of transaction costs, of 75 basis points per month. However, daily trading leads to substantial transaction costs, which account for a net return not greater than zero. Although there are market inefficiencies, they are not easily exploitable by traders. When the portfolio rebalancing is done on a less frequent basis, the gross return diminishes. The gross return also diminishes when there is a delay in reaction to the recommendations of the analysts. The only case when advantage

can be taken of the analyst recommendations is when an investor wants to buy or sell stocks anyway. Then, the transaction costs are unavoidable and the investor is better off buying favorable recommended stocks and selling unfavorable recommended stocks.

Based on the findings of Barber et al. (2001) we trust in the forecasting abilities of the analysts in general. Therefore, we assume that the analysts in the dataset we use are among the top quartile analysts which results in an information coefficient between 0.13 and 0.09.

Desai, Liang, and Singh (2000) find that following a buy-and-hold strategy for stock recommendations by Wall Street Journal's All-Stars outperform similar companies in the same industry. They also found that analysts who focus on one specific industry do better than analysts who cover multiple industries. With the additional insights of Desai, Liang, and Singh (2000), we select an IC of 0.09. This is because we assume that the investors from our dataset do not focus on one specific industry.

C. Score

The score is a standardized measure that shows how strongly you feel about a specific stock at a particular time. To determine the score, a buy advice will be given a +1 score, a sell advice will be given a -1 score, and a neutral advice will be given a 0 score. We used information of Binck Bank to determine the scores. An example of the dataset of Binck Bank of the stock of Ahold is presented in figure 1.

Deutsche Bank	James Collins	Hold	9,90	12-11-2010
KBC Securities	Pascale Weber	Accumulate	11,30	12-11-2010
HSBC	Jerome Samuel	Equal-weight↓	10,50	08-11-2010
Rabo	Patrick Roquas	Hold↓	11,00	05-11-2010
Goldman Sachs	Franklin Walding	**Buy↑**	12,20	28-10-2010
KBC Securities	Pascale Weber	Accumulate	11,30	19-10-2010
JP Morgan	Matthew Truman	Overweight↓	12,60	12-10-2010
ING	John David Roeg	Hold↓	12,90	08-10-2010
Royal Bank of Scotland	Justin Scarborough	**Buy**	11,80	04-10-2010

Figure 1: **Analyst's recommendations**

In the data set of Binck Bank, several descriptions of buying, selling, and holding advices are used. We coded all these descriptions as a buy, sell, or neutral advice, as stated in table 1.

Table 1: Coding descriptions

Buy	**Neutral**	**Sell**
Accumulate	Hold	Overweight
Outperform	Market Perform	Underperform
Underweight	In-line	Reduce
Moderate Buy	Equal Weight	
Strong Buy	Under- review	
	Peer- perform	

For the determination of the score we used the advices of January 2011 and December 2010. We computed an average of the several advices to assign a score to each stock, where every analyst is weighted equally. We think that an average is a better estimate of the analyst's recommendation, instead of basing the recommendation on just the last analyst recommendation. Otherwise, we would lose valuable information from earlier analyst recommendations. The average score ranges from -1 to +1. This is different from the scores used by Grinold (1994), where analyst scores are -1 or +1. This results in lower absolute values of alphas for our model.

D. Portfolio creation

The first step in constructing the portfolio is the creation of an efficient frontier based on 25 risky assets (the stocks of the AEX index). Hereafter, we create the tangency portfolio which has the highest Sharpe ratio. As input we need the expected volatility and the return of the stocks and the correlations between the stocks. The volatilities are based on the returns of the last year. The expected returns are based on the standard CAPM model. The inputs of the CAPM are the historical betas of the stocks, the risk-free rate, and the equity premium. According to Dimson, Paul, and Staunton (2002) the equity risk premium for world stocks is between 4.4% and 5.7%. Therefore we use an average of this benchmark for the equity premium, which results in an equity premium of 5.05%. The third step is adding the alphas to the expected returns. This gives a "better" expectation of the returns, because we make use of the analyst recommendations.

Correlations are based on the average correlation model, using the average of the correlations of the last 20 years, which has the best predictive power in explaining future correlations between stocks (Elton, Gruber, Brown, and Goetzmann, 2010, p. 166). Due to the fact that only long stock positions are available, the model corrects the portfolio weights for short positions. Short positions are neglected and the portfolio is reweighted.

Based on all the inputs, we compose the portfolio using the most recent analyst recommendations. The corresponding portfolio is shown in figure 2. Of course, these weights will change due to the release of new analyst recommendations.

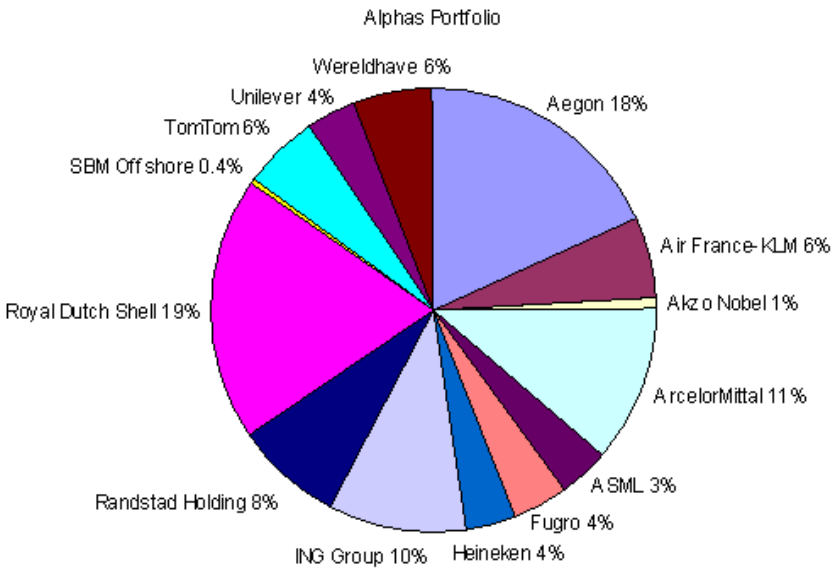

Figure 2: Alphas portfolio weight

In this portfolio, some stocks are not selected. According to the model, we had to take short positions in Ahold, BAM, Boskalis, Corio, DSM, KPN, Philips, Reed Elsevier, TNT, Unibail Rodamco, and Wolters Kluwer. Because short sales are not available in the AEX universe, we decided to exclude these stocks from the portfolio.

E. Fees

Based on the findings of Barber et al. (2001) we can adjust the formula used by Grinold (1994) in such a way that the transaction costs are included. With this new variable we can write out the formula:

$$\text{Alpha} = \text{Volatility} \times \text{IC} \times \text{Score} - \text{Fees}^{1} \quad (3)$$

Fees are the transaction costs from rebalancing the portfolio. A new analyst recommendation changes the alpha and thus the expected return, which on its turn changes the optimal composition of the portfolio.

We make an estimation of the transaction costs, based on historical data, for this active strategy to change the composition after every analyst recommendation. In 2010 there were a total of 745 changes from sell to buy or buy to sell for the 25 stocks of the AEX. We used the corresponding transaction costs of at least 0.08%[2] per transaction from Binck Bank. This results in transaction costs of 119.6% of the portfolio value for one year if the whole portfolio is rebalanced after each new recommendation. Of course, not the whole portfolio will be rebalanced every time. We find that on average about 2.24% of the portfolio is rebalanced after a single change in analyst recommendations. This all results in transaction costs of 2.67% in one year. This is a significant loss of return due to the many transactions needed in this investment strategy[3].

Barber and Odean (2000) show that the 20% most active trading investors earned annual returns of 5.5% lower than the return on the index. They show that this is mainly due to the high transaction costs. These costs are not only composed from our 2.67% brokerage cost, but also from the bid-ask spreads. Therefore, we are going to create a much less active portfolio in the second part of our report.

II. Affect Portfolio

In this section we construct a portfolio based on a combination of the affect theory, the self-fulfilling prophecy, and our intuition. We create this portfolio, among other reasons, for the fact that the alphas portfolio results in high transaction costs.

A. Theoretical background

Statman (2010) finds in his working paper that company names are more related to future stock returns than company characteristics, e.g. a positive company name has a greater impact on expected future stock returns than, for example, book-to-market ratios and market capitalization. He finds that when people have to predict the future return on a scale of 1 to 10 from a list with company names and industries or the same list with additional company characteristics, the selected companies (stocks) are not different. Therefore, he adopts the affect hypothesis in stead of the characteristics hypothesis.

If we combine Statmans (2010) findings with the self-fulfilling prophecy of Merton (1948) we come to our portfolio selection method. This will be discussed in the next subsection, but first we will discuss this prophecy.

Merton (1948) describes in his article that a false definition in the beginning can evoke a new behavior, which makes the originally false definition becomes true. So, if everybody believes that something will happen, they behave like it actually will happen, which eventually makes it happen. For example, if a lot of people think that a bank will go bankrupt, while there is no fundamental evidence for this, they will withdraw their money, which creates a bank run. This results in a bank that will get into problems and eventually face bankruptcy.

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[1] This formula is adopted from North Point Advisors.http://www.enewsbuilder.net/mchenrygroup/e_article000326383.cfm?x=b11,0,w

[2] The transaction costs are composed from a fixed amount plus 0.08% of the transaction value. Because the size of the portfolio is not known, the fixed amount is neglected, and therefore the transaction costs are at least 0.08%.

[3] If the portfolio of figure 2 is hold for one year the return is 2.29% higher than that of the AEX based on the CAPM returns. Although this is not the active strategy explained in this paper, it gives an idea for the performance of the strategy.

B. Stock selection

We believe, for the composition of our portfolio, that if a lot of people want to invest in specific stocks, because they think they will earn a high return, the stock eventually will earn a high return. This is independent of the true fundamental value. We base the selection of the stocks on the feeling that people have with a company, or in the words of Statman, the affect with a company name. Therefore, we call our portfolio the affect portfolio.

C. Data

The information for the construction of the portfolio was collected by asking 52 students of the University of Groningen about their preferences. We showed the students a list of the 25 alphabetically ordered stocks of the AEX index with their names, logos, and the industries the companies are active in. The students were asked to indicate in which five stocks they would equally invest when they were given €100.000. In the end, we had 260 choices, on which we based the portfolio weights. The constructed portfolio is shown in figure 3. Boskalis and Wereldhave are not included in this figure because they were not selected by the students.

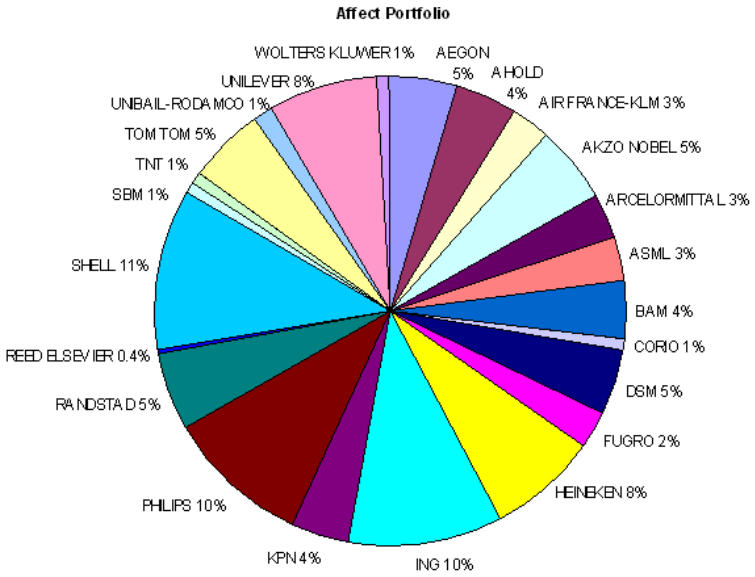

Figure 3: Affect portfolio weights

D. Remarks

We would like to make some remarks on the affect portfolio presented above. We advice to conduct the survey quarterly. We think three months is the appropriate time interval because people's view of companies changes over time. Conducting the survey monthly is not appropriate because the possible gain from changes in weights will not offset extra transaction costs. Companies disclose financial reports four times a year, so people's view can change at least four times a year. Therefore, conducting the survey less than four times a year is not sufficient.

We buy the stock when the expectations of these stocks are high, which probably will be represented in the price. Our portfolio strategy can thus be described as a convex buy-and-hold strategy, because we buy high and sell low. We adjust the stock weights every quarter and therefore we expect our portfolio to perform well in rising markets and falling markets, but performs less good in reversing markets.

III. Conclusion

In this report we constructed two portfolios with the purpose to beat the AEX index. We based the construction of the portfolios on two different approaches. The first approach was the alpha method explained in Grinold's (1994) article. By adjusting the assumptions of Grinold (1994) we were able to construct a portfolio of which we expect that it will beat the AEX index, in the absence of transaction costs. We advice to add a variable to the formula. This variable represents the transaction costs. When the fees variable is included, the formula is a better representation of the real world, because transaction costs can have a significant influence.

The second approach was partly based on literature and partly based on our intuition. This portfolio is based on customer perspectives and the self-fulfilling prophecy theory. We think the stocks in this portfolio were more randomly picked, but will beat the AEX mainly based on Statman's (2010) research where he finds that company names are more related to future stock returns than company characteristics. Combining this with the self-fulfilling prophecy and the low transaction cost there is a strong basis for this portfolio to outperform the AEX.

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