Executive Summary

Problem

Traditional finance assumes that the stock market is efficient and all investors act rationally when it comes to investment decisions (Lo, Repin, and Steenbarger, 2005). Different market anomalies have shown that psychological and social aspects have an impact on the decision-making process of humans. Those decisions cannot be explained based on traditional finance and might lead to bubbles and financial crises. In financial literature, it has controversially been discussed, whether it is possible to outperform the stock market in the long-term by using market-timing tools (Riccardi and Simon, 2000). A well-known sentiment index is the Fear and Greed Index (F&G-Index) calculated by CNN Money (2021), where the purpose is to use investor emotions to find the right time to enter or leave the market. It is used as a barometer for market-timing, facing the criticism of not being a suitable research tool (CFI, 2020). In addition, many researchers attempt to construct sentiment indices based on different indicators in order to outperform the market. Nevertheless, there are researchers who argue, that after transaction costs, the buy-and-hold strategy cannot be beaten and those sentiment indices lead people to trade too frequently (see for instance Fama and Blume (1966) or Jensen and Benington (1970)).

After the introduction, Section 2 provides an overview of the investors' trading emotions where the emphasis is placed on fear and greed in financial markets. Furthermore, the technical analysis and the existing indices for market-timing purposes are described. In Section 3, the understanding of the index is developed by explaining the composite process construction and the importance of the index indicators. After providing an in-depth description of the relevance of the seven index indicators, they are applied to the Swiss stock market. Building up on this, Section 4 highlights the historical development, which provides the basis to apply the F&G-Index for the Swiss stock market and analyses the empirical results. In the last section, a conclusion is drawn and further research is proposed.

Method

The data sample contains the time span of January 2001 to June 2020, whereby the data was downloaded from the Swiss Exchange (SIX), Bloomberg and the Swiss National Bank (SNB). Various different indices such as the Swiss Performance Index (SPI), the Swiss Market Index (SMI) and the Volatility Index on the SMI (VSMI) are employed to calculate the seven indicators used for the F&G-Index for the Swiss stock market. Based on the method of CNN Money (2020), the sentiment index is constructed. The indicators used are the stock price momentum, stock price strength, stock price breadth, put and call options, junk bond demand, market volatility and save-haven demand. All indicators are normalized using the z-score and combined equally weighted to the F&G-Index. As a next step, the buy and sell signals of the SMI are selected. The portfolio consists of two parts, bonds and investments in the SMI. The bond used is the 10-year spot interest rate of the Swiss Franc (CHF) Swiss Confederation bond, which can also be seen as the risk-free rate. The investment is at all times fully allocated and no cash is held. The portfolio is rebalanced as soon as a predefined signal is triggered. The contrarian, the

momentum, and the mix of both strategies are used to build the portfolios.

To analyze whether abnormal portfolio return alphas with investment strategies based on the F&G-Index can be achieved, different benchmark models are used. The first one is the market premium factor, called the Capital Asset Pricing Model (CAPM) developed by Sharpe (1964) and Lintner (1965). The second model is based on the CAPM, where Fama and French (1993) added the factors size and value to construct the three-factor model. The last benchmark model is the four-factor model of Carhart (1997), which in addition includes the momentum factor to analyze the portfolio return alphas. In a further step, different robustness checks are performed for the portfolio returns to provide additional results. The variations consist of transaction costs, different smoothing and winsorizing methods of the F&G-Index as well as the usage of time-dependent sub-samples.

Results

Over the sample period of January 1, 2002 to June 30, 2020, the constructed F&G-Index has its mean at 0.00, the median at 0.12 and a standard deviation of 0.76. The SMI has an annualized return of 4.23% with a standard deviation of 18.42%. Despite the positive average return, the maximum annual drawdown resulted in a loss of -45.09%. Mostly the mixed portfolio types performed best. Those portfolios invest in the SMI when investors are extremely fearful or extremely greedy. Furthermore, by using more trading signals, which were selected based on the historical data, the risk-adjusted annualized return is higher. But transaction costs of either 0.20% or 0.10% diminish those results. Therefore, fewer trading signals are advantageous when considering transaction costs. With the contrarian strategies, where the SMI is sold when the market sentiment is greedy and where it is bought when the sentiment is fearful, higher returns could be achieved than when using the momentum approach, where the investors invest with the crowd. In general, no statistically significant alphas could be achieved neither for the contrarian nor for the momentum strategy. An exception, therefore, is the usage of a sub-sample where only the time period of crisis is used. This means that only the end of the dot-com bubble, the financial crisis, and the beginning of the worldwide pandemic of coronavirus disease 2019 are included. In those periods risk-adjusted annualized returns between 24.10% and 29.04% can be realized using the contrarian portfolio. Statistically speaking, significant results could be attained using the mixed portfolios for the entire time span, as well as for time-dependent sub-samples, resulting in risk-adjusted annualized returns of 7.71% to 8.40% for the entire period. Nevertheless, the F&G-Index is not always leading compared to the movement of the SMI and can therefore not optimally predict the stock price change. This is consistent with other studies, which explored the impact of sentiments on the stock market and could only confirm partially that the sentiment index is leading over stock market prices (see for instance Guo, Sun, and Qian (2017)). Different robustness tests are shown with varying F&G-Index construction methods. The results are only partially robust to the changes of the index. However, the triggers might have to be changed for those adapted portfolios to receive better results. Additionally, transaction costs and other changes can impact the results significantly. To summarize the results, this thesis illustrates under its limitations that the F&G-Index can be partially used as a market-timing tool.

Evaluation

A market, where excessive returns can be generated by using technical analysis and calculations, is inefficient in the weak form. The empirical results show that using the F&G-Index as a market-timing tool can only partially outperform and profitably exploit the Swiss stock market. Various strategies are built and result in statistically significant outcomes. Although the information on the historical prices of the used indicators is publicly available, there seems to be potential to further examine it. Based on Fama (1998) market anomalies that contradict the efficient market hypothesis in the long-term are either achieved by chance, by overreaction or underreaction of the stock prices to information. Furthermore, data snooping is another possible explanation. However, those effects will vanish either over time or by changing the methodology as the optimal triggers vary over time. Therefore, it is difficult to find triggers that can be used to outperform the market in changing time periods. This implies that the triggers which work for a certain data sample are not necessarily able to outperform the Swiss stock market in a random time period. Particularly noteworthy for portfolio management is that it is essential to treat the triggers carefully and individually for the various indices as changes in the methodology might have an impact on the outcome.

The results of this thesis have to be used with care and different possible shortfalls are to be kept in mind. First, the regression coefficients are calculated using European risk factors. Researchers have shown that country-specific risk factors generally are better in explaining time-series variations than global factors (Fama, 1998; Griffin, 2002; Hou, Karolyi, and Kho, 2011). Second, the empirical part of this thesis is based on data from SIX, Bloomberg, and SNB. Those sources are generally reliable and widely used by researchers and professionals. However, there might be mistakes among the data, which can influence the calculated index. Obvious mistakes in the data were corrected manually. Third, the outcome of the thesis relies on the data selected and the methodology used. A change in methodology can have an impact on the outcome. Fourth, the volatility of the stock market might impact the sentiment with a delay. Lastly, active trading can be costly. Besides the transaction costs, there are further costs such as management fees or taxes that have to be paid depending on the trading platform and the country of investment.

Several further research ideas are conceivable. Firstly, the F&G-Index can be tested on other stock markets similar as it is conducted for the Swiss Stock market. Furthermore, different indicators beside the chosen ones from CNN Money (2020) can be used to construct an index. Also, using machine learning to select triggers or construct the index would be another approach. Additionally, it can be tested whether there are different behavioral patterns in various markets and whether the same triggers work for different periods.

To summarize, the contrarian sentiment index might lead investors to trade excessively, which in combination with transaction costs can diminish the returns (Fisher, 2014). At the same time, this index is a good proxy, given its limitations it should be applied with other detailed analyses. The research has proven that the F&G-Index can determine the timing to enter or leave the market. The index can also be used as a barometer to avoid following the crowd when they are greedy as the returns of the momentum strategies were lower than the one of the contrarian or mixed strategies in this thesis.