Executive Summary

Problem

Monetary policy, is the policy set by the central bank. The question how the policy affects the market of equities is of great interest to financial market participants and policy makers regarding the induced effects on the value of stocks. The decisions of the Federal Open Market Committee (FOMC) on the Federal Funds Target Rate (FFTR), which are transmitted into short- and long-term interest rates, have extensive economic consequences. Consequently, changes in the FFTR have an impact on the capital cost of firms as well as on the discounting rate of future cash flows. Early studies such as Thorbecke (1997) and Jensen et al. (1996) documented a link between monetary policy and the stock market through an identified vector autoregression (VAR). However, this study reviews the effect of monetary policy by applying an event study method. This approach makes it possible to examine the positive or negative abnormal returns of stocks prior and after the event day, the day on which FOMC decides the target level of the FFTR. The empirical analysis within this study covers the period between 1989 and 2008. Following the study of Fama and French (1992), this study creates 25 subsamples according to market capitalization and book-to-market ratio to analyse the effect of FFTR shocks on the stock market. Further, the stock market will also be analysed based on industry sectors.

Method

The empirical analysis of this study follows the event study approach proposed by Fama et al. (1969). This approach enables the analysis of the impact of a certain event on the value of firms and other financial products and is therefore popular in areas of economic and financial research. The first step in conducting an event study is to decide on the event of interest. The Federal Open Market Committee (FOMC) is an essential government institution in the United States of America, regularly meeting eight times a year and is responsible for the implementation of the monetary policy. After the deciding on the target level of the FFTR the monetary policy is then implemented by the Open Market Desk at the Federal Reserve Bank of New York. Kuttner (2001) reasoned, that the market reaction is nearly nonexistent to anticipate the shocks. In consideration of this finding, the changes in

the FFTR are broken down into expected (anticipated) and unexpected (unanticipated) parts of the rate changes. Kuttner (2001) introduced a method using the price of Federal fund future contracts traded on the Chicago Board of Trade. These future contracts represent the market expectations of the effective Federal fund rate, averaged over the settlement month. They can be used to distinguish between the expected and the unexpected component of the FFTR.

This thesis follows the methodology of Kuttner (2001) in using the FOMC meeting dates and separating these into expected and unexpected events, focusing mainly on the unexpected FFTR changes. Starting with the launch of the Federal future contract in 1989 until mid 2008 after that the financial crises FOMC changed from a target rate announcement to a target range. Therefore, the timeframe analysed in this thesis ranges from 1989 until June 2008.

Secondly, the estimation window is set up prior to the event, the normal returns are estimated during a period of 350 days. The estimation is done with a constant mean return model, which does not relay on any market factors. The advantage of this model is essential for this event study, as the market is expected to react upwards on changes announcement of the FFTR, leading to a potential bias of the market factor.

Thirdly, the abnormal returns are calculated for the event window, the days prior and after the announcement day. Abnormal returns are defined as the differences between the estimated normal returns and the actual returns observed at the time of the event. For the purpose of the statistical hypothesis tests, the abnormal returns are aggregated and averaged across the securities and across the FOMC meetings that are included. A consensus can be found in the academic literature that macroeconomic shocks such as FFTR changes can affect a large number of firms at the same time. In other words causing event clustering. Two problems must be considered for the hypothesis tests when event clustering has occurred. Firstly, event clustering leads to cross-sectional correlation between returns. Secondly, normally event clustering is usually accompanied by an event induced volatility change. Subsequently, a standard t-test cannot be used because of the violation of their assumptions. Kolari and Pynnönen (2010) introduced a test statistic, which is robust against cross-correlation of returns as well as unaffected by the volatility changes in the event window. Further, the non-parametric test statistic by Corrado (1989) is used in this thesis. The Corrado test features a transformation of returns into ranks and therefore is not relying on the

assumptions regarding the distribution of returns. The daily stock return data for the empirical analysis is obtained from the CRSP database. It includes all the securities traded on the major stock exchanges in the United States. The entire stock data sample is divided into several subsamples, such as double-sorted portfolios, according to market capitalization and book to market ratio, and industry-based subsamples in order to investigate whether differences in abnormal returns can be attributed to specific characteristics of the security. The accounting data used in the calculation of the book market has been obtained from Compustat.

Conclusion

The result obtained by the event study are analysed focusing on the two main scenarios the unexpected FFTR decrease and increase, further an analysation is conducted on the results of the expected FFTR shocks. The key findings regarding the case of unexpected FFTR decrease can be summarized as follows: At the day after the event, the magnitude of the abnormal returns is bigger for higher book-to-market ratio samples as for samples with lower ratio. Some of the samples are boosting a 1% level of significant for both applied test statistics. Negative abnormal returns are observable one to two days prior to the FOMC announcement with a significant level up to 5%. This downward drift prior to unanticipated shocks was previously documented by Hu et al. (2019). They argue, that this drift is caused by uncertainty in the market in anticipation of the announcement. The Efficient Market Hypothesis can be rejected for several subsamples given an unexpected FFTR decrease, in its strong form, especially for samples with high book-to-market ratio and high market capitalization. The strong form of EMH is claiming that all information is factored into the current price and therefore, earning abnormal returns based on private or public information is not possible (Fama (1970)). However, significant positive abnormal returns are observed after the event day (t=1) and for t=5, even the semi-strong form can be rejected. The observed effects are also in similar manner observable in the industry sorted samples. With only the Retail Trade and Finance, Insurance and Real Estate sectors are showing positive and significant CAARs on a 5% level for 2 and 3 days and only weak significance for 3 days. The two expectation are Mining and Agriculture, Forestry and Fishing that are showing negative CAARs but not significant.

The findings for the unexpected FFTR increase consist of five key findings: To begin with, samples with lower book-to-market ratio show a higher magnitude of negative AARs with significance of 1% for Kolari and Corrado test statistics. To the authors knowledge, these findings have not yet been documented in other financial literature. Further, all 25 subsamples show negative and significance of 1% or 5% level for 2 to 4 days CAARs. This observation is consistent with the findings previously mentioned in point one. The days prior to the FOMC announcement ($t = -1$ to $t = -3$) negative abnormal returns are observed. This negative drift before unanticipated shocks is documented by Hu et al. (2019) and is caused by uncertainty in the market in anticipation of the monetary policy. The Efficient Market Hypothesis can be rejected for most subsamples in the unexpected FFTR increase set up in its strong form. Since the significant abnormal returns are observed on the event day or the day after ($t = 0$ respective $t = 1$) the semi-strong form of EMH can be rejected. Not only can the effects of the monetary policy be seen on the 25 double-sorted samples but also on the industry sorted samples. Further, some industry sectors react exceptionally strong as documented by Jansen et al. (2013). The identical industry sectors have been found in this thesis, with abnormal return for Retail Trade of a magnitude of -2.076% followed by Service with -1.993%.

In contrast to the straightforward results of the unexpected FFTR shocks, the results of the expected shocks draw a different picture. Positive shocks show positive abnormal returns for higher market capitalisation buckets as well as for higher book-to-market ratio buckets. On the other hand, negative FFTR changes show negative AARs and CAARs. A possible explanation for this effect could be, that expected monetary policy changes are linked to the economic state. Therefore the market interprets the increase in interest rate as a sign for better economic outlook. The opposite might be true for expected expansionary monetary policy. However, the majority of the abnormal returns, may it be for increasing or decreasing FFTR, are not significant with only a few showing weak significance. Interestingly, highly significant and positive abnormal returns are observed for the expected FFTR decrease for the day $t = -3$. A possible explanation could be that the FOMC leaks news regarding the upcoming meeting as suggested by CIESLAK et al. (2019), however it is up to further research to investigate these abnormal returns prior to anticipated shock announcements.

In conclusion, it remains an open question if investors can exploit unexpected FFTR changes in order to earn significant abnormal returns. The CAARs in this study are significant across 2 to 4 days unexpected FFTR increase and weakly significant for higher book-to-market ratio in case of a FFTR decrease. Other announcements such as mergers and acquisitions, dividends, earnings and unemployment tend to provide CAARs for longer periods.