

**University of Zurich**

Department of Banking & Finance

Chair of Financial Economics

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Bachelor Thesis

# **„A comparison of size and power between the OLS-market and Fama-French three factor model in event studies”**

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## Executive Summary

It is commonly known that security prices react to news arriving at the market place. The event study methodology provides a framework to measure this effect. The success of the event study methodology can be attributed to its strength to separate abnormal return which is conditional to an economic event, from the normal return which would be expected, if no event had taken place. One of the key elements for this task is to get accurate predictions for normal returns, which are needed to compute the abnormal returns induced by the event. The approach has gained popularity as data quality and availability is constantly rising (Anhern, 2006, p. 2).

The purpose of this thesis is to investigate the performance of the OLS market model and the Fama-French three factor model within this methodology. The question is if the Fama-French three factor model is able to reduce variance of the abnormal returns better than the OLS-market model, which should translate in better performance in the event study context. The models are employed by using the genre defining simulation based approach from Brown and Warner (1985), where the power and size of the models can be compared with real return data (NYSE, AMEX, NASDAQ). The Brown and Warner (1980) simulation methodology randomly samples security and event days. Those combinations should result in an average event day abnormal return of zero and constitutes a benchmark of comparison for the empirical results (Anhern, 2006, p. 2). The null hypothesis is that no abnormal return is present. The performance of the two models is consequently judged according to their values for power and size. The t-test statistics are built using the portfolio based approach from Boehmer et al. (1991) along with scaled abnormal returns as defined from Patell (1976). One tailed tests are conducted to compute rejection frequencies for different sample sizes for a single event day.

The results reveal that within the chosen experimental design, the test statistics are well specified for both models. Additionally, both models yield good properties to detect abnormal performance when it is present. Further, the Fama-French three factor model shows slightly better values for power than its opponent in this study. Generally, this paper recommends the use of the Fama-French three factor model for US stock markets, as the model's factors are available in a standardized form and the results were slightly better than for the OLS. Additionally, power was found to be related to the portfolio size. As expected, power for a given level of abnormal performance rises with the portfolio size. Further, the equally weighted market index for the market model was investigated, but no superior performance was found over the value weighted index, whereas there is some indication for slightly better values of power for the Fama-French four factor model.