



Executive Summary

High volatility and unpredictable mood swings are some of the main characteristics of the stock markets in recent years, causing capricious price fluctuations without generating lasting returns for the market participants. And not only since the financial crisis can extreme changes in the market's valuation of a stock price entail a large loss of financial resources within a single trading day. However, such large price declines may be irrational in some cases. The phenomenon of excessive market reaction describes how new information drives share prices beyond fair values. An event of a large one-day price decline may be cited as market overreaction, if the stock price tends to revert back to a higher level in the days immediately following this unusually large share price drop. If this is not the case, then the price shock apparently is in line with fundamentals. As a consequence, the stronger the exaggeration, the larger will be the price reversals that a stock experiences. This paper fills a gap in the literature by investigating how the short-term price reactions differ for firms with diverging performance and value characteristics and, secondly, in varying market phases after large negative price shocks. Prior studies mainly focus on the stock market of a certain country and analyze if they find general support for the overreaction effect for all shares listed on that specific stock exchange. However, neither it was at the center of the analysis to evaluate if the exposure to overreaction varies dependent on firm performance characteristics, nor to consider overall market sentiment as another factor influencing post-event price reversals.

The phenomenon of excessive market reaction contradicts the tenet of the traditional investment paradigm, which states that today's large and fast global equity markets are 'efficient'. Formalized by Fama (1970), the Efficient Markets Hypothesis (EMH) generally refers to as the informational efficiency of financial markets. It postulates that an efficient market is able to quickly and correctly reflect new information in the valuation of assets, so that the prices at any point in time are determined by a company's fundamentals. However, extensive academic research since the beginning of the 1980s has challenged this hypothesis and shows that several market anomalies, which seem to contrast the EMH, exist. One of those anomalies is the well-known overreaction effect, which describes the tendency of investors to overreact to bad (good) news, pushing the stock price temporarily below (above) its intrinsic value (Diacogiannis et al. (2005)). This non-rational behavior of investors leaves room for predictable price reversals, both in the short and long term.

De Bondt and Thaler (1985) were the first to document that the market in the long-run (i.e. they analyzed stocks over a time horizon of three years) systematically overreacts to new information and stock prices thus are pushed beyond their true fundamental values. On the other hand, the question whether the arrival of new and unexpected information causes investors to overreact even in a very short time horizon (i.e. within a single trading day) was addressed early by Atkins and Dyl (1990), who find evidence in support of the overreaction hypothesis. Inspired by the authors' findings, the empirical science has been eager to verify the overreaction effect in different equity markets around the globe and to find possible explanations for the excessive reaction (note that a comprehensive literature overview is provided in the paper). Using an interdisciplinary approach that includes insights from finance, psychology as well as biology, academics suggest that triggers for such irrational economic behavior can be related to individual behavioral biases, social



dynamics and evolutionary dynamics. Individual behavioral biases are a consequence of people relying on a limited number of heuristics in the decision-making process and, alongside with social dynamics, can lead to excess optimism or pessimism and herd behavior (Tversky and Kahneman (1974)). Evolutionary dynamics, on the other side, describe that whenever humans face a decision, our system of intuition and emotions encounters our system of logical reasoning, resulting in conflicting signals (Hens and Preuschhoff (2012)). The triggers for price overreactions are thoroughly examined in the paper in order to provide the reader with a theoretical framework.

Whereas research has proved that excessive price movements are not uncommon to encounter in global equity markets, only little is known whether the overreaction effect is evident at varying degree depending on firm performance characteristics or depending on the economic condition of a market. Hence, the aim of this paper is to address the following research questions:

- Is there a difference in the reaction of stock prices – measured by short-term post-event price reversals – dependent on firm performance characteristics?
 - *Are firms with strong fundamental performance figures more strongly exposed to market exaggerations than firms with poor fundamental performance figures?*
 - *Are firms that appear undervalued relative to fundamental performance figures more strongly exposed to market exaggerations than firms that rather appear overpriced?*
- Is there a difference in the reaction of stock prices – measured by short-term post-event price reversals – dependent on the prevailing market phase?
 - *Are stocks generally more strongly exposed to market exaggerations in a bull market or in a bear market? The terms bull market and bear market hereby describe upward and downward market trends, respectively.*

In a first step, the empirical analysis evaluates the existence of short-term contrarian profits between January 1999 and December 2011 for stocks listed on the STOXX Europe 600 Index. In order to spot possible overreaction events, a new methodology based on the described triggers for overreaction is proposed. While it was common in earlier studies to analyze stocks that experience a daily price change of 10% or more, the new definition constitutes two requirements to count as an event. First, a stock must experience a negative daily return of at least -8% and, second, the absolute value of the price decline needs to exceed the standard deviation of the stock's daily returns over the last 30 days prior to the price shock. This definition ensures that the change in price indeed is unusually high compared to normal price fluctuations, and thus avoids event signals caused by very volatile stocks. For all selected events, this study analyzes absolute price reversals, referred to as rebound returns, and relative price reversals, labeled as abnormal returns, for which the return of the index over the exact same time period is subtracted from the rebound return. Evaluating various stock holding periods of between 1 and 30 trading days after the initial price shock, significant evidence of overreaction is found. It is established that the finding of short-term reversals is not a small-firm phenomenon. Further, a comparison of the results of both overreaction definitions reveals that the newly proposed methodology is advantageous because it more accurately reflects the market overreaction effect (i.e. returns are higher and standard errors lower).



Second, the study applies the principles and ideas from the well-known investment philosophy ‘Value Investing’ to differentiate between high and low quality stocks. The analysis comprises two different multiple regression analyses as well as the formation and evaluation of various different sample groups to examine the explanatory power of firms’ fundamental quality figures (net income, free cash flows, leverage ratio and EBIT margin) and value ratios (price-earnings ratio, price-book ratio and price-free-cash-flow ratio). The results reveal that the average price reversals for high quality stocks, characterized by strong fundamental performance figures, are significantly larger than for low quality stocks. In addition, stock prices of companies with low price-earnings ratios – representative for undervalued stocks – tend to revert stronger than those of, if compared to their earnings power, rather overpriced stocks. Quality and value therefore reassures investors’ confidence in the by the shock affected stock, so that a large price decrease on a single trading day is interpreted as a temporary opportunity to buy shares at a discount.

Furthermore, this paper segregates the short-term price reversals into six various market phases, each of which describes a distinct economic and investment environment in the period between January 1999 and December 2011, and into groups dependent on the prevailing overall market sentiment. The results show that, on average, both rebound and abnormal returns are larger at a time when investors are more bullish and the market currently is in an upward trend. If the market, on the other hand, is in a downward trend, bearish investors who likely are worried about an ongoing stock market correction prevent the prices to significantly revert. Further results imply that it is possible to infer from the price trend of the STOXX Europe 600 Index and the implied volatility in the European market – variables approximating overall market sentiment – if the price reversals in stock prices are more or less likely to encounter.

In the last part of the paper and in contrast to the results of other authors who similarly conduct studies about overreaction and argue arbitrageurs could not profit from price reversals (e.g. Atkins and Dyl (1990)), it is shown that clever behavioral investors can indeed take advantage of these market anomalies by implementing active trading strategies. It is acknowledged, in line with earlier findings, that an investor who trades all events eventually goes bankrupt because the combination of excessive trading and transaction costs prohibits the implementation of a profitable trading strategy. However, the possibility of only trading a selection of all noticed event stocks, by applying filter rules, has been disregarded so far. In particular, the performance analysis verifies the existence of economic profits from exploiting short-term reversals in the European equity markets: If from all event stocks only those firms are considered as investments that meet pre-determined quality and value characteristics, at a point in time when the prevailing overall market sentiment complies with some beforehand specified requirements, positive short-term contrarian profits are possible. The positive returns are achieved with a stock holding period of either 5 or 30 trading days. They persist even after accounting for round trip transaction costs of 1% (which deem reasonable for private investors but maybe too high for professional investors) so that the presented contrarian strategies clearly perform better than the index over the same period.

The findings of overreaction in the European markets are consistent with irrational behavior by investors, which allows predicting future returns with past prices, and thus violate the EMH.



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