Momentum profits, market cycles, and rebounds: Evidence from Germany

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ABSTRACT

Recent evidence shows that U.S. price momentum strategies suffer tremendous losses in times of highly volatile market recoveries. We extend the existing literature by analyzing the performance of both price and earnings momentum portfolios across different market states. For our German sample, we find that the long–short price momentum strategy loses almost 9% per month during market rebounds. This so-called momentum crash is solely due to recovering loser stocks. After a prolonged bear market hits bottom, the loser portfolio is mostly composed of highly volatile and leveraged small-cap stocks, which have lost nearly 83% of their market value over the preceding year and are thus susceptible to heavy rebounds. Interestingly, the momentum crash phenomenon seems to disappear once we control for exposures to the Fama–French factors, with the market factor being the most relevant. By contrast, earnings momentum strategies are less affected by market rebounds and also consistently outperform price momentum strategies on a risk-adjusted basis.

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1. Introduction

The unexpected and sizeable losses U.S. long-short price momentum strategies incurred following the 2008-2009 global financial crisis have attracted attention from both practitioners and academics. Prior to that, it was often believed that momentum in developed countries works consistently well across all market states. Recently, however, Daniel and Moskowitz (2015) show that momentum strategies exhibit infrequent but strong strings of negative returns, causing their distribution to be negatively skewed. They coined the term "momentum crashes" for the short-lived periods of poor momentum performance, which follow severe bear markets when volatility is still high and the market begins to recover. Indeed, for the two most recent 2003 and 2009 market reversals we find that the maximum drawdowns of our German

long–short price momentum strategy amount to staggering −43.3% and −47.7%, respectively.

Inspired by these intriguing losses, Daniel, Jagannathan, and Kim (2012) and Barroso and Santa-Clara (2015) developed trading strategies that attempt to manage the time-varying nature of the price momentum anomaly. Evidence provided in Grundy and Martin (2001), Cooper, Gutierrez, and Hameed (2004) as well as Asem and Tian (2010) also suggests that momentum profits depend crucially on the state of the market, either because of time variation in the factor-related return component or due to a changing impact of behavioral biases. We contribute to this strand of literature in several ways. First, we assess the performance of both price and earnings momentum strategies across different market states. The two anomalies are the main types of momentum and generally regarded as closely intertwined (e.g., Chordia & Shivakumar, 2006; Leippold & Lohre, 2012). Second, we compute time-varying factor exposures that mirror the strategies' changing portfolio composition during bull and bear markets as well as volatile market rebounds. Third, we analyze the portfolio constituents' characteristics to identify differences between the composition of price and earnings momentum strategies and to uncover potential reasons for their partly diverging return patterns. Fourth, by drawing on

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the German stock market, we provide an out-of-sample robustness check for the predominantly used U.S. data. Antoniou, Doukas, and Subrahmanyam (2013) report that U.S. retail investors are slow to sell loser stocks during optimistic periods, which subsequently leads to strong negative momentum in the short leg. While the number of individual shareholders represents 25.4% of the U.S. population (Deutsches Aktieninstitut, 2010), the proportion reaches merely 6% in Germany. The different institutional setting is also mirrored in the ownership of shares held in custody at financial institutions domiciled in Germany. At the end of 2012, private households owned merely 9.4% of all circulating shares that were held in domestic security deposits (Deutsche Bundesbank, 2013). These figures indicate that the German stock market is mainly dominated by institutional investors. Nevertheless, the market exhibits a remarkable momentum effect. A reason for this could be that in rather individualistic Western societies, even professional investors tend to suffer from behavioral biases, such as overconfidence and self-attribution. According to Chui, Titman, and Wei (2010), the degree of individualism is positively correlated with the magnitude of momentum profits.

Our main empirical findings can be summarized as follows. While price momentum crashes are exclusively caused by a reversal in the prices of past loser stocks, the earnings momentum strategy does not incur severe losses as its long and short leg deliver equally large raw returns during market rebounds. The different behaviors around market rebounds cast some doubts on a potentially stable one-to-one correspondence between the two variants of momentum, although both might be related to the same underlying cause. We therefore also examine the time-varying relationship between both anomalies and find that long-only and long–short earnings momentum portfolios outperform their price momentum counterparts on a risk-adjusted basis. Moreover, price momentum portfolios exhibit a much stronger sensitivity to their earnings momentum counterparts than vice versa. We thus corroborate the U.S. market findings of Chordia and Shivakumar (2006) and conclude that earnings momentum subsumes price momentum to a large extent, while the converse is not the case. Put differently, the price momentum anomaly not only seems to be partly driven by underreaction to earnings-related information but also decouples from earnings momentum during market rebounds due to a deviating factor-related return component.

In summary, momentum crashes appear to be unique to price momentum and are exclusively driven by recovering loser stocks. Daniel and Moskowitz (2015) report that losers' exhibit pronounced call option-like behavior after a sustained bear market. We extend this evidence by showing that proxies for firm-specific risk are disproportionately high for loser stocks, while their financial performance variables reflect poor fundamental quality. These firm characteristics substantiate the losers' option-like features (see also Daniel et al., 2012).

Although our findings are mainly ex post in nature, they are useful to investors to better understand the pitfalls of momentum investing and thus encourage further research on how to implement trading strategies capable of avoiding momentum crashes. The remainder of the paper is organized as follows. Section 2 explains our research design, while Section 3 describes the data used in this study. Section 4 presents our empirical results and Section 5 concludes.

2. Methodology

2.1. Construction of momentum portfolios

Our price momentum strategies capture the well-known medium-term return continuation in the cross-section of the stock market (Jegadeesh & Titman, 1993). On average, stocks that recently outperformed their peers continue to outperform their peers over short horizons, while past relative losers continue to underperform. By contrast, our earnings momentum portfolios capitalize on the post-revision price drift triggered by changes in analysts' earnings forecasts (e.g., Chan, Jegadeesh, & Lakonishok, 1996; Dische, 2002; Doukas & McKnight, 2005; Leippold & Lohre, 2012).

We construct price momentum portfolios according to Fama and French (1996), Carhart (1997) and Daniel and Moskowitz (2015). At the beginning of each month t, we rank all sample firms on their 11-month lagged return from $t-12$ to $t-2$. We skip the most recent month $t-1$ to avoid the effect of short-term price reversals (see Grundy & Martin, 2001, for a brief literature review on the negative serial correlation in monthly stock returns). Based on their ranking period return, all sample stocks are sorted into quintiles. The winner portfolio consists of the stocks in the top quintile, while the loser portfolio comprises the stocks in the bottom quintile. We also build a zero-investment portfolio WML ("winner-minus-loser") that goes long the winner quintile and short the loser quintile. We compute equal-weighted returns for a one-month holding period before we rebalance the portfolios again.

For the earnings momentum strategies, we use the direction of analysts' forecast revisions as our sorting criterion. At the beginning of each month t, portfolios are formed by ranking all stocks according to their earnings forecast revision ratio (ERR) from the previous month $t-1$. This ratio has been employed by Czaja, Kaufmann, and Scholz (2013), among others, and is defined as follows:

$$\text{ERR}_{i,t-1} = \frac{\left(\text{FY1}_{\text{UP},i,t-1} + \text{FY2}_{\text{UP},i,t-1}\right) - \left(\text{FY1}_{\text{DOWN},i,t-1} + \text{FY2}_{\text{DOWN},i,t-1}\right)}{\text{FY1}_{\text{TOTAL},i,t-1} + \text{FY2}_{\text{TOTAL},i,t-1}}. \quad (1)$$

For each firm i, $\text{FY1}_{\text{UP},i,t-1}$ and $\text{FY2}_{\text{UP},i,t-1}$ represent the number of current fiscal year (FY1) and next fiscal year (FY2) analysts' earnings forecasts revised upward during month $t-1$ relative to the previous month $t-2$. Correspondingly, $\text{FY1}_{\text{DOWN},i,t-1}$ and $\text{FY2}_{\text{DOWN},i,t-1}$ denote the number of current fiscal year and next fiscal year analysts' earnings forecasts lowered during month $t-1$. $\text{FY1}_{\text{TOTAL},i,t-1}$ and $\text{FY2}_{\text{TOTAL},i,t-1}$ indicate the total number of earnings estimates for the current and the next fiscal year that make up the I/B/E/S consensus during month $t-1$.[1] Based on their ERR ranking, we assign stocks to quintiles and compute equal-weighted portfolio returns over the one-month holding period.[2] The bottom quintile portfolio is labeled ERR Low and comprises the stocks with the lowest ERRs. Portfolio ERR High represents the top quintile made up of the stocks with the highest ERRs. The corresponding long–short strategy is denoted by ERR High–Low.

2.2. Definition of market conditions

We categorize primary trends in the German stock market into bull and bear market cycles. This ex post classification has to ensure that the identified market phases are long enough to produce persistent and statistically significant differences in mean returns (Gonzalez, Powell, Shi, & Wilson, 2005). More important, we are interested in the behavior of momentum strategies during market phases that are clearly distinguishable from one another in terms

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[1] As a robustness check, we also experimented with alternative measures of analysts' forecast revisions such as the monthly change in mean FY1 earnings forecasts scaled either by the absolute value of the prior consensus forecast or by the prior month's stock price (e.g., Doukas & McKnight, 2005; Leippold & Lohre, 2012). However, the earnings momentum effect turns out to be strongest for the ERR.

[2] We also computed value-weighted portfolio returns. However, both the price and earnings momentum effect are much stronger for equal-weighted portfolios, which is why we only concentrate on the latter in our analyses. Especially for the loser and ERR Low portfolios, the negative momentum effect is less pronounced when returns are value-weighted.