Executive Summary

Problem Statement

Herding behaviour is a widely-explored phenomenon in the empirical literature of behavioural finance. In contrast to rational asset pricing models, the theory of herding predicts that investors reject reliance on private signals in times of enhanced volatility. Hence, investors follow the market consensus rather than their private information set, a choice that triggers individual equity returns to converge with the overall market return. Consequently, the dispersion between individual equity returns and the equally-weighted market return, referred to as cross-sectional-absolute-deviation (CSAD), decreases. This empirical study investigates herding behaviour in four equity markets by applying the proposed approaches of Christie and Huang (1995) and Chang et al. (2000). This thesis lays primary focus on analysing the Swiss equity market with the objective of applying a variety of herding models to conduct a comprehensive investigation of whether or not stock prices are capable of deviating from their fundamental value, a condition that would contradict rational asset pricing models. Contemporary empirical research has begun to incorporate proxies for investor sentiment into herding models. To extend such work, this thesis integrates investor sentiment proxies, such as those proposed by Baker and Wurgler (2006), to consider the effects of market sentiment during times of market turmoil and tranquil trading.

As a complement, the second part of this thesis presents an alternative approach to proxies for investor sentiment, as proposed by empirical literature. According to Shiller et al. (1984), news media have a considerable influence on the formation of market sentiment and herding activities within a market. As such, this second chapter aims to develop a sentiment index for four companies listed on the Swiss Market Index (SMI) by using news articles published over the course of the last two years. These extracted sentiment signals are then applied to visualise how news media cover the particular companies and are further compared with the performance of the stock price. Thus, the primary objective is to illustrate the presumed influence of news media to the overall perception by the market participants, hence delivering a new variable, which could be integrated into existing herding models.

Empirical Methodology

The extension of this empirical study to the existing literature is a key consideration of the three statistical approaches with which herding behaviour is to be examined. The ordinary least squares (OLS) regression conducted by Chang et al. (2000) reveals many methodological vulnerabilities, which were addressed by alternative approaches in this empirical study. Hence, in addition to applying the OLS approach to herding analysis, this research investigates two further approaches, a quantile regression (QR) approach, which evaluates different quantiles of a distribution, and a univariate autoregressive Markov approach, which is capable of detecting time variations in herding behaviour. This empirical study primarily follows the herding models proposed by Chiang and Zheng (2010), thus going beyond the alleged non-linear correlation of the dispersion of equity returns and market return. The study is also focusing on the investigation of herding behaviour at times of up- and down-market days, cross-listing effects arising from the US market, and herding in the course of foreign asset price bubbles and financial crises. These herding models are then extended through the integration of volatility indices and share turnover by volume as a proxy for investor sentiment. These additions potentially enhance the explanatory power of the variation of the equity return dispersion and thereby contribute to the further explanation of herding behaviour and its potential transitions by switching from a low to a high dispersion state and vice versa.

The second part of this thesis addresses the development of an alternative measure for investor sentiment by employing methods of natural language processing (NLP), the majority of which are used in computational linguistics. Using dictionary-based sentiment analysis, newspaper articles from two data sources (IBM Watson News Discovery and GBI-Genios) are examined. In a subsequent stage, these sentiment signals may then be applied in aggregation in the creation of a proxy for the overall market sentiment. Ultimately, the extracted sentiment signals from these newspaper articles are implemented into a simple long-short equity trading strategy, which is based exclusively on these sentiment signals.

Evaluation of the Results

The results of the empirical study of herding behaviour reveal pronounced herding activities in the 1980s and 1990s in Switzerland. Furthermore, the Swiss equity market exhibits significant herding activities in asymmetric market conditions, especially during down-market days. The Swiss market is also subject to possible cross-listing effects emanating from the US market, as a significant positive correlation to the equity return dispersion of the American market has been found. In times of foreign asset price bubbles and financial crises, such as the Subprime mortgage crisis, there exists a general increase in herding, which is apparent for all

approaches investigated in the Swiss market, which in turn leads to stock prices failing to reflect their fundamental value in periods of such extreme market returns. However, it should be noted that the results gathered are not equally valid across all methodologies employed within this study. The OLS and QR approaches mostly coincided, observing pronounced herding activities for the Swiss equity market; however, the autoregressive Markov switching model (MSWM) could not always detect the same deviation from fundamentals. To some extent, these conflicting results underline the fragility of Christie and Huang's (1995) pioneering model. Generating a causality between the decrease in equity return dispersion and investors' herding activities is a sophisticated undertaking that requires further attention. The extension of the initial model, by including investor sentiment proxies, specifies a valid starting point. The sentiment proxies integrated exhibit a significant influence on the explanatory power of the variation of the equity return dispersion.

The second part, which takes a closer look at the subject of investor sentiment, reveals that the extracted sentiment signals exhibit a positive correlation with the stock price movements, although this may not equally apply to all companies as the news articles analysed by the dictionary-based sentiment analysis are of varying quality. As a next step, the sentiment analysis conducted would require an extended data source and the processing of additional companies to create a valid proxy for market sentiment, which in turn may be integrated into existing herding models. Finally, the alternative use of sentiment signals within a trading strategy appears to achieve reasonable results, which leads to a small excess return over a defined benchmark. However, the high portfolio concentration, the additional risk incurred due to increased leverage, and the imbalanced exposure in the long and short positions need to be considered in a future implementation of this trading strategy, which has hitherto been solely based on sentiment signals.