



Investor sentiment and return predictability of disagreement



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ABSTRACT

This study examines the influence of investor sentiment on the relationship between disagreement among investors and future stock market returns. We find that the relationship between disagreement and future stock market returns time-varies with the degree of investor sentiment. Higher disagreement among investors' opinions predicts significantly lower future stock market returns during high-sentiment periods, but it has no significant effect on future stock market returns during low-sentiment periods. Our findings imply that investor sentiment is related to several causes of short-sale impediments suggested in the previous literature on investor sentiment, and that the stock return predictability of disagreement is driven by investor sentiment. We demonstrate that investor sentiment has a significant impact on the stock market return predictability of disagreement through in-sample and out-of-sample analyses. In addition, the profitability of our suggested trading strategy exploiting disagreement and investor sentiment level confirms the economic significance of incorporating investor sentiment into the relationship between disagreement among investors and future stock market returns.

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1. Introduction

Investor sentiment is one of the attractive issues in the field of finance. A growing body of recent research insists that investor sentiment and stock market returns are closely related.¹ This view is a great challenge to classical asset-pricing models, which assume that investors are rational and that asset prices are determined by a risk–return relationship. The literature on investor sentiment argues that the market sentiment and behavioral biases of investors affect both overall market returns and individual asset returns, which is not explained by any current rational asset-pricing framework. Among various sentiment-related issues, this study focuses on the relationship between disagreement among investors and future stock market returns. The concept that disagreement among investors' opinions has implications for asset-pricing originates from a seminal paper by Miller (1977), which claims that, in contrast with optimistic opinions, pessimistic opinions are not easily reflected in market prices because of short-sale constraints. Subsequent empirical studies, including Chen et al. (2002), Diether et al. (2002), Park

(2005), Yu (2011), and Hong and Sraer (2012), support the arguments of Miller (1977) and report that disagreement among investors' opinions results in overpricing under the existence of short-sale constraints. This study reexamines the role and effect of disagreement on stock market returns by considering time-varying levels of investor sentiment.

Previous sentiment literature suggests several reasons why short-sale impediments exist in the stock market (Yu and Yuan, 2011; Stambaugh et al., 2012). The effects of short-sale impediments are more strongly applied in the stock market during high-sentiment periods than during low-sentiment periods, primarily because more individual investors participate in the stock market during high-sentiment periods, making their influence on market prices stronger (Karlssohn et al., 2009; Yuan, 2012). Also, individual investors are generally reluctant to short stocks because of limited knowledge and/or behavioral biases. Barber and Odean (2008) report that only 0.29% of individual investors take short positions. Accordingly, on average, short-sale impediments are stronger during high-sentiment periods due to an increased tendency to avoid short selling of stocks caused by the increased participation of individual investors. Secondly, D'Avolio (2002) finds evidence that, to take short positions, investors need supplies of stock loans which are mostly provided by institutional investors. Stocks are more likely to be overvalued during high-sentiment periods, and taking a short position is more costly due to lower

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¹ See, e.g., Kamstra et al. (2000), Hirshleifer and Shumway (2003), Dowling and Lucey (2005), Edmans et al. (2007), Bradley et al. (2009), Palomino et al. (2009), Kaplanski and Levy (2010), Białkowski et al. (2012), and Chen et al. (2013).

supplies of stock loans during high-sentiment periods since institutional investors who know about the over-valuation would not supply stock loans. Lastly, Shleifer and Vishny (1997) also point out that risks in arbitrage play an important role in explaining short sale impediments. Even though stocks are overvalued, the stock prices may continue increasing for a short period before eventually falling and recovering the fair values. In other words, risks in arbitrage are mainly caused by the difficulty in forecasting short-term movement in stock markets. Behavior of irrational and inexperienced investors is usually unsystematic and hard to predict. During high-sentiment periods, sentiment investors, who are generally irrational and inexperienced, are dominant in the stock markets (Yu and Yuan, 2011). Thus, it is more difficult to forecast short-term stock price movement for rational investors who perceive the over-valuation of the stock markets. Since additional capital is required to maintain short positions against unexpected short-term increments in the stock markets, rational investors experience higher risks in arbitrage during high-sentiment periods. However, investors do not face these risks in arbitrage to take long positions in the stock markets. In particular, these risks in arbitrage are critical for institutional investors whose career paths largely depend on the short-term performance. Overall, our research sheds some light on the relationship between disagreement and future stock market returns utilizing the relationship between the measurable degree of investor sentiment and the unobservable degree of short-sale impediments.

In the same line of Stambaugh et al. (2012), Yu and Yuan (2011), and Shen and Yu (2012), our study combines investor sentiment with the effects of short-sale constraints on stock market returns to explain market phenomena. To the best of our knowledge, our study is the first to examine the effects of sentiment on the relationship between disagreement and future stock market returns. Our empirical evidence confirms our hypothesis that the dispersion of investors' opinions about the stock market leads to over-valuation in the stock market only during high-sentiment periods. Cen et al. (2013) deal with a similar issue by suggesting that the relationship between changes in breadth and future stock returns is driven by investor sentiment or dispersion among investors' opinions. In their model, changes in breadth are decomposed into changes in the sentiment of buyers regarding stocks and changes in the disagreement among buyers regarding stocks. Based on their model, they show that the relationship between the changes in breadth and future stock returns is negative (positive) if the effect of sentiment (disagreement) on breadth dominates. Their research focuses on a considerably different issue from ours, since our paper investigates the time-varying relationship between disagreement and future stock market returns depending on the level of market sentiment. In addition, while Cen et al. (2013) use breadth as a measure affected by both disagreement and sentiment independently, we use dispersion among analyst earnings forecasts as a direct measure of disagreement among investors' opinions.

While the previous literature investigates the direct relationship between sentiment and future stock market returns,² some recent studies about investor sentiment have expanded to include explanations about the relationship between sentiment and important stock market phenomena.³ For example, Stambaugh et al. (2012) find that investor sentiment is one of the key factors that generate anomalies in cross-sectional stock returns. Their study finds that the anomalies are more significant during periods of high sentiment than during periods of low sentiment. Yu and Yuan (2011)

examine how investor sentiment affects the risk–return relationship in the stock market based on the assumption that conditional stock market variances are proxies of the stock market risk. They observe that the positive risk–return relationship is highly significant in low-sentiment periods, whereas it is not significant in high-sentiment periods. Shen and Yu (2012) also find that macroeconomic variables play significant roles in asset pricing in periods of low sentiment, but not in high-sentiment periods.

We extend the recent literature on investor sentiment issues by presenting the time-varying return predictability of disagreement considering the effects of investor sentiment. We utilize the disagreement measure suggested by Yu (2011) and the investor sentiment index suggested by Baker and Wurgler (2006). Consistent with Yu and Yuan (2011), we regard conditional stock market variances as proxies of market risk. Our study investigates whether the return predictability of disagreement depends on investor sentiment after controlling for the market risk. During low-sentiment periods, the return predictability of disagreement is not significant, whereas it is highly significant during high-sentiment periods. For instance, the coefficient estimates on a 24-month average of disagreement among analyst forecasts are highly significant in the in-sample analysis. An increment of a one-standard-deviation of the 24-month average of disagreement among analyst forecasts can lead to a decrease in monthly log stock market excess returns ranging from 1.49% to 1.53%. This negative relationship between future stock market returns and disagreement among analyst forecasts in our empirical results is consistent with the empirical results in Park (2005) and Yu (2011). In addition to the significant results of the in-sample analysis, the out-of-sample analysis also confirms the predictability and economic significance of the disagreement with investor sentiment, respectively. Furthermore, we develop a profitable trading strategy considering the effect of investor sentiment on the relationship between disagreement and future stock market returns, suggesting that our findings also provide meaningful implications for market practitioners.

The rest of this paper is organized as follows. Section 2 describes the dataset and the empirical methodology we utilized to explore our hypothesis. Section 3 presents our main empirical findings. Section 4 evaluates the profitability of the trading strategy exploiting the predictability of disagreement with investor sentiment. Section 5 describes the robustness tests used to verify our results. Section 6 concludes our study.

2. Data and methodology

This section describes the data and methodology used in this study. In Section 2.1, we explain the methodology for measuring disagreement among analyst forecasts. In Section 2.2, the properties of investor sentiment are described. In Section 2.3, we present data about stock market returns.

2.1. Disagreement among analyst forecasts

In this paper, we employ the analyst forecasts of the long-term growth rate of earnings-per-share (EPS) as a proxy for investors' beliefs about the future prospects of individual stocks. This measure is used in many research papers, such as Moeller et al. (2007) and Yu (2011). According to Yu (2011), there are several important reasons why this forecast is a suitable measure of dispersion among investors' opinions: one is that the measure plays an important role in valuation models, and another is that it is less affected by a firm's earnings guidance relative to forecasts of short-term EPS growth rate. Additionally, an expected growth rate is easily comparable among firms. The data are obtained from the I/B/E/S database. Park (2005) shows that dispersions among analyst

² See, e.g., De Long et al. (1990), Lee et al. (1991), Shleifer and Vishny (1997), Barberis et al. (1998), Brown and Cliff (2004, 2005), Baker and Wurgler (2006, 2007), and Lemmon and Portniaguina (2006).

³ See, e.g., Baele et al. (2010), Yu and Yuan (2011), Baker and Wurgler (2012), Baker et al. (2012), Stambaugh et al. (2012), and Shen and Yu (2012).

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