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Analysts and sentiment: A causality study

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ABSTRACT

We analyze the role that financial analysts play in the sentiment effect on stock prices. Causality analysis reveals that sentiment affects various aspects of analysts' forecasts and recommendations. We show that experienced analysts are aware of sentiment, consciously incorporate it and have some control over its effect. As a result, the sentiment effect on analysts replicates the sentiment effect expected in stock prices and actual forecast errors are limited to certain cases. Analysts expedite the propagation of sentiment to stock prices and probably enhance the effect by influencing sophisticated investors, but they do not initiate or shape it. The new regulations, "Research Analysts and Research Reports" and "Communications with the Public", imposed in 2002, have reduced over-optimism due to sentiment.

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1. Introduction

Ample empirical evidence shows that investor sentiment affects stock prices. The effect of sentiment is mainly attributed to individual noise traders (De Long, Shleifer, Summers, & Waldmann, 1990; Lee, Shleifer, & Thaler, 1991; Shleifer & Summers, 1990) and dumb money (Frazzini & Lamont, 2008). However, sentiment is a complex phenomenon and the exact mechanism by which it propagates and affects the market is vague and often associated with other price patterns (e.g., Aissia, 2016; Liston, 2016) commonly classified as anomalies. This study shows that sentiment profoundly affects forecasts of financial analysts. As financial analysts influence other investors, we actually analyze the role that analysts play in the mechanism by which sentiment affects stock prices.

Regardless of analysts' ability to predict stock prices,¹ many studies show that analysts do not rely solely on fundamental

valuation models but also consider non-economic factors. Prominent examples are valuation heuristics (Bradshaw, 2004) and herding (Trueman, 1994), which are also affected by career concerns, reputation, ability, affiliation, private information and frequent revisions (e.g. Graham, 1999; Hong, Kubik, & Solomon, 2000; Jegadeesh & Kim, 2010). Investor sentiment also affects analysts. Ke and Yu (2009) find that sentiment reduces the effectiveness of the translation process from objective models to final recommendations. Bagnoli, Clement, Crawley, and Watts (2009) find that analysts issue more favorable recommendations when the level of sentiment is high.

Covering about 34 years and 3 million records of U.S. stocks, this study adds several dimensions to the existing literature linking sentiment to analysts' work of making earnings forecasts and stock recommendations. First, we answer the crucial question of whether sentiment affects analysts or alternatively analysts are

in consensus recommendations is a robust predictor of future returns. Boni and Womack (2006) show that trading according to analyst recommendations within the industry yields abnormal returns, while Sorescu and Subrahmanyam (2006) show that experienced analysts and analysts with superior reputations forecast returns better than other analysts.

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¹ Several studies find that analysts' work contains economic value. Womack (1996) finds that trading according to recommendations yields abnormal gross returns. Jegadeesh, Kim, Krische, and Lee (2004) find that the quarterly change

one of the sources of investor sentiment. We show that sentiment precedes changes in analysts' forecasts. Granger's (1969) causality analysis reveals that sentiment affects analysts, whereas the time frame and the evidence on causality do not support the possibility that analysts initiate sentiment. The causality timeline evidence is consistent with Verma and Soydemir (2009), among others, who show that irrational traders' sentiment is not driven by rational sentiment. Namely, analysts do not initiate sentiment and correspondingly do not shape its characteristics, as is further elaborated below. Instead, analysts expedite the propagation of sentiment to stock prices and probably enhance its impact as they also influence investors who are more sophisticated than noise traders and allegedly less prone to being directly affected by sentiment (Danbolt, Siganos, & Vagenas-Nanos, 2015). This enhancement is further intensified as the U.S. investor sentiment also significantly affects other markets, mainly through the trading activity of institutional investors (Sayim & Rahman, 2015; Verma & Soydemir, 2006).

Next, we explore whether analysts are misled by sentiment or, alternatively, they are aware of sentiment and consciously incorporate its expected effect on stock prices into their forecasts. If analysts are misled by sentiment, they actually take part in creating and shaping this phenomenon. Otherwise, analysts simply adhere to the expected sentiment effect in stock prices created by noise traders and their role is confined to enhancing its propagation. To shed light on the awareness question, we first explore the implications of the effect on various aspects of analysts' forecasts. Time series analysis reveals that sentiment encourages analysts to update their earnings forecasts, which produces significant changes in the magnitude of earnings forecasts and final recommendations. However, *ex post* earnings surprises reveal only weak actual forecast errors due to sentiment. Panel data analysis of individual earnings forecasts reveals significant forecast errors due to sentiment conditional on analyst and firm types.

Second, we compare the effect of sentiment on analysts with that on stock prices, showing that in many respects the two effects are similar. In line with the results of Baker and Wurgler (2006), Stambaugh, Yu, and Yuan (2012), Antoniou, Doukas, and Subrahmanyam (2013) and others, the two effects are more profound for firms that are more difficult to arbitrage and more exposed to sentiment-based demand. The divergence across positive and negative sentiments is also very similar, and so is the association with the momentum phenomenon of Jegadeesh and Titman (1993). The dependence of the results on the sign of sentiment also suggests that the unconditional sentiment effect on analysts explored in other studies is offset and therefore a more refined analysis is needed, which this study provides.

Third, we use the new regulations as a natural experiment to explore directly whether analysts are aware of sentiment. Several studies find that conflicts of interest affect analysts (e.g., Mehran & Stulz, 2007; Miller & Sedor, 2014; Mola & Guidolin, 2009), a problem that has led to new regulations and the "Global Research Analyst Settlement"² enforcement actions against major banks (hereafter "the sanctioned banks"), which have changed analysts' practices (Barber, Lehavy, McNichols, & Trueman, 2006; Kadan, Madureira, Wang, & Zach, 2009; Muslu & Xue, 2013). The distinction between the pre- and the post-regulation period reveals different, and in many respects opposite, sentiment effects, implying that the results obtained in other studies on analysts and sentiment present an incomplete view of the sentiment effect. In particular, we find that the over-optimistic tendency in the pre-regulation period of

experienced analysts and analysts from the sanctioned banks has been replaced by an exaggerated sense of pessimism. As experienced analysts are more capable of identifying sentiment than inexperienced analysts, and analysts from the sanctioned banks are probably more concerned about allegations of over-optimism than other analysts, we attribute the change in the effect of sentiment on the forecasts of those analysts to their ability to identify and control it.

The empirical evidence shows that experienced analysts are aware of sentiment, at least to some extent, and consciously incorporate it into their forecasts and recommendations, a phenomenon that was more profound before the new regulations were imposed in 2002. As a result, the effect on their work is mainly a reflection of their expectations regarding the sentiment effect on stock prices. This is why the two sentiment effects are very similar, despite being very complex and supposedly influenced by different factors. The ability of analysts to control the effect of sentiment is also supported by the fact that the impact on their work is limited to updates of earnings forecasts with no actual errors at the aggregate level. The result that analysts consciously incorporate sentiment into their forecasts and recommendations provides an extreme example in which even professional financial analysts, let alone private investors, may find that it is not always beneficial to bet against the noise traders, as advocated by De Long et al. (1990). It also illustrates the major role that regulations can play in controlling and mitigating such phenomena.

The remainder of the paper is organized as follows: Section 2 presents the data and methodology; Section 3 presents the empirical results of the time series analysis and the causality evidence; Section 4 presents the empirical results of two panel data analyses; and Section 5 concludes.

2. Data and methodology

The main data source is the I/B/E/S database of analysts' recommendations for U.S. companies. Covering up to 34 years, depending on the specific tests, from January 1980 to March 2013, time series analysis with monthly (or quarterly) aggregated summary records is undertaken to explore the time characteristics and possible causality of the sentiment effect. The 1,479,201 summary records include the monthly means of outstanding earnings per share (EPS) forecasts and recommendations for that firm, as well as the number of revisions made since the previous month. Panel data analyses of 2,926,474 individual records of single forecasts and recommendations are conducted to explore the interaction between sentiment and firm and analyst types.³

Table 1 describes the main variables employed. To explore the effect of sentiment, in Panel A, we define three variables that represent the different phases involved in making earnings forecasts (hereafter EF): *EF-update*, *EF-change* and *EF-surprise*. *EF-update* measures whether the analyst updates his/her earnings forecast, and it is equal to 1, 0 or -1 if the analyst upgrades, does not change or downgrades his/her forecast. *EF-update* is not affected by the magnitude of the forecast and therefore is less sensitive to outlier earnings observations. *EF-change* is defined as the difference in

³ We omit records with missing data, duplicate records, non-U.S. dollar records and the 0.5 and 99.5 percentiles of "actual earnings" and "forecast earnings." As in most cases the extreme actual earnings and forecast earnings observations overlap, the total number of excluded observations is 1.2% (rather than 2%). No other change is made to the data. The purpose of excluding these records is to eliminate clear errors as well as extreme observations that do not belong to the explored population but are rather technically created due to extreme reverse splitting, when the company reduces the total number of outstanding shares by a constant unification factor. As such events usually precede the delisting of those stocks, any remaining survival bias due to this omission is very small.

² In December 2002, the SEC announced the Global Research Analyst Settlement, which settled allegations that analysts from ten leading banks (the sanctioned banks) had provided investors with misleading information. Two other banks joined the settlement eight months later.

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