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News sentiment and the investor fear gauge

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ABSTRACT

This note examines the relationship between aggregate news sentiment and changes in the implied volatility index (VIX). A significant negative contemporaneous relationship between changes in VIX and news sentiment is discovered. The relationship is asymmetric whereby changes in VIX are larger following the release of negative news items.

1. Introduction

Often referred to as the "investor fear gauge", the market volatility index [VIX] expresses a consensus view about expected future stock market volatility; the higher the VIX, the greater the fear in the market. Prior work has considered the relationship between the implied volatility index and stock market returns. Fleming et al. (1995), Whaley (2000, 2009) and Giot (2005) find a significant negative and asymmetric contemporaneous relationship between stock returns and changes in implied volatility; VIX increases more as the S&P500 index falls than it decreases when the S&P500 index rises. Engle and Ng (1993) also report an asymmetric effect when studying the impact of news shocks on the Japanese stock market. Such results are explained by the leverage effect of Black [1976] who argues that, given a fixed level of outstanding debt, a company will become more highly leveraged as its stock price declines inducing higher volatility in equity returns. However, recent work by Hasanhodzic and Lo (2011)

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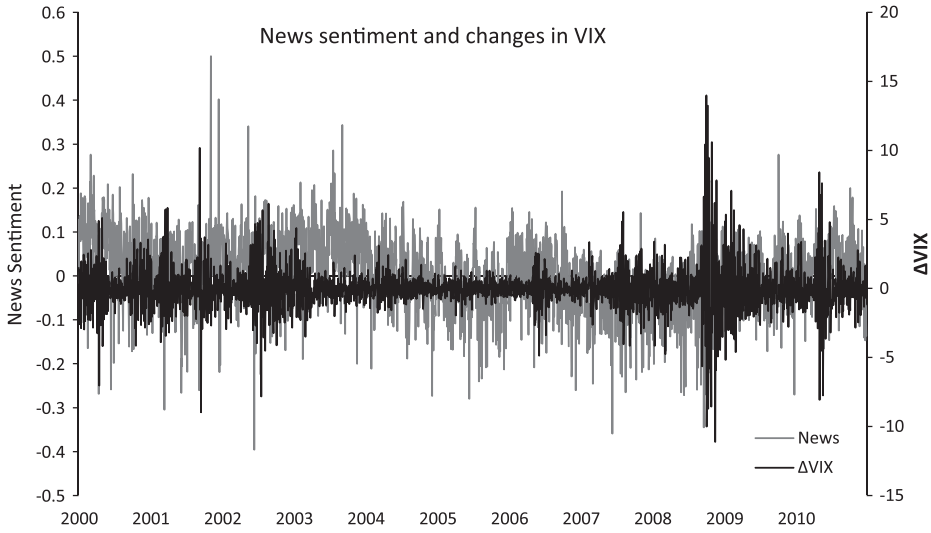

Fig. 1. Daily aggregate news sentiment (left-axis) and changes in VIX (right-axis).

suggests that the effect is stronger than may be explained by financial leverage alone and time-varying expected returns, volatility-feedback, and investor risk perceptions should be considered as alternatives.

A related field of work in financial economics has considered the impact of news arrival on stock returns and volatility of those returns, identifying that the arrival of firm-specific news can drive movements in both stock prices and volatility. Earlier research focused on scheduled news, such as dividend announcements and earnings results. For example, Patell and Wolfson (1984) and Woodruff and Senchack (1988) find that much of the market adjustment occurs in the first 30 min following corporate announcements. More recently, the contextualisation and quantification of news content has enabled the identification of a wider range of news events. The relevance and sentiment of news has been tested in a variety of market settings with reference to stock returns. Tetlock et al. (2008) find that a quantitative measure of language can predict firms' earnings and stock returns, Dzielinski et al. (2011) finds that positive (negative) news results in above (below) average returns. Groß-Klußmann and Hautsch (2011) and Smales (2012) find that high-relevance news induces an increase in market activity, with negative news sentiment having a greater impact than positive news. Prior work has yet to investigate whether aggregated firm-specific news has an empirical relationship with the implied volatility of an overall market index.

This note intersects these two developing avenues of economic research and investigates the empirical link between the release of firm-specific news and implied volatility indices. More precisely, I seek to examine the contemporaneous relationship between unscheduled aggregate news releases and changes in implied volatility. Aggregating news sentiment for the constituents of the S&P 500 Index, over the period 2000–2010, I examine the relationship between news sentiment and changes in the index of implied volatility (VIX) (see Fig. 1). I find a significant negative relationship between news sentiment and changes in VIX, with positive (negative) news related to a decrease (increase) in VIX; the relationship is much stronger during the financial crisis period of 2007–2009. I find evidence of an asymmetric effect whereby the magnitude of the change in VIX is larger during periods of negative news.

2. Data

2.1. News sentiment

Several vendors offer software tools that electronically analyse textual information in news releases using linguistic pattern recognition algorithms; words are translated into indicators of the