Public Relations Review xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Public Relations Review

Lagging behind? Emotions in newspaper articles and stock market prices in the Netherlands

Nadine Strauß*, Rens Vliegenthart, Piet Verhoeven

Amsterdam School of Communication Research (ASCoR), Department of Communication Science, University of Amsterdam, The Netherlands

A R T I C L E I N F O

Article history:
Received 21 July 2015
Accepted 25 February 2016
Available online xxx

Keywords:
Stock market
Newspapers
Emotions
Computer-assisted content analysis
Time series analysis

A B S T R A C T

This study investigates emotions in Dutch newspaper articles and their effects on, and responses to, opening prices of 21 stocks listed on the Amsterdam Exchange index for twelve years (2002–2013). With regard to the financial context, we employed a selection of the Dutch Linguistic Inquiry and Word Count dictionary to automatically content analyze emotional tone in news articles (N = 128,507). Neither positive nor negative emotions in news articles show consistent effects on the opening prices of stocks the following day. Granger causality tests suggest, however, that newspapers rather reflect movements on the stock market the following days by using more negative emotional words after an increase in the change of the opening prices.

1. Introduction

Despite the widespread and in synch provision of financial news and algorithm trading, it seems that investors do not anticipate the bursting of financial bubbles as, for example, experienced during the Global Financial Crisis 2007–2009. Rather, it appears that the market is not fully based on rationality, but subject to affective behavior by traders, such as herd-like behavior or emotional reactions (Neri, 2009). At the same time, increasing news coverage, commentaries and opinion pieces on financial topics demonstrate a tendency of the media to cover these developments on the market (e.g., Tesla's April Fool 2015), suggesting a strong relationship between media and the stock market.

However, reversed effects, the complex interaction and the mechanism between media and the stock market have hardly been investigated so far—and, above all, not from a communication science perspective (cf. Lee, 2014; see for an exception Kleinnijenhuis, Schultz, Oegema, & Atteveldt, 2013; Scheufele, Haas, & Brosius, 2011). Existing works in economics or business are primarily simulation models that investigate market indices, e.g., Dow Jones or S&P 500, but not paying attention to differences across stocks from diverse sectors or the peculiarity of news media coverage (e.g., Hayo & Neuenkirch, 2013 looking at macro-economic announcements). Therefore, the supposed reciprocal relationship between media coverage and the stock market remains to be tested.

Facing irrational exuberance on the markets (Shiller, 2000), it becomes crucial to examine to what extent emotions in news affect movements of stock market prices; or, in turn, to find out whether price movements of various stocks dictate the extent of coverage and emotions the media ascribe to these stocks the following days.

* Corresponding author at: Amsterdam School of Communication Research (ASCoR), Department of Communication Science, University of Amsterdam, Nieuwe Achtergracht 166, Amsterdam 1018 WV, The Netherlands.
E-mail address: n.strauss@uva.nl (N. Strauß).

http://dx.doi.org/10.1016/j.pubrev.2016.03.010
0363-8111/

In fact, scholars from behavioral finance have investigated the impact of emotions on trading decisions by means of experiments (Lee & Andrade, 2015); but research on the role of news media in conveying emotions, and thereby, contributing to movements on the stock market, has remained fairly unexplored so far. Taking the Netherlands as a case example, this study contributes to this field in assessing the reciprocal effects of emotional tone in Dutch leading newspaper articles on the opening prices of 21 stocks of the Amsterdam Exchange index (AEX) between 2002 and 2013.

2. Theoretical framework

While representatives of the efficient market hypothesis (EMH) have downplayed the impact of media coverage on the financial market vehemently in the past (Fama, 1965), behavioral economics and behavioral finance (Nofsinger, 2005) have put the EMH in question and showed that the stock market can indeed be predicted to a certain extent, and partly by media coverage (Tetlock, 2007).

The reason media are presumed to affect the stock market is given by investors who do not act fully rationally when making trading decisions, but are triggered by herd behavior (Oberlechner & Hocking, 2004). Herd behavior on financial markets implies that decisions taken by investors are less based on the actual value of a stock, but rather on the consensus opinion; thus, what they believe other traders might sell or buy (Prechter, 2001). Here, media are allocated a crucial role, as media sources (e.g., financial news) often report to reflect the consensus market opinion (Davis, 2006). In addition, various scholars have stressed the interdependent relationships between leading news media, financial journalists, investor relationship practices, and financial analyst. For example, by employing a Delphi methodology, Laskin (2011) found that one of the four key areas for practitioners in investor relations is to enhance analyst coverage about the company (cf. stock) they are working for.

2.1. Media attention

Building on the theory of herd behavior, it is likely that the attention media devote to specific stocks influences investors' trading decisions. According to Shiller (2000), attention created through the media increases investors' interest in those stocks, leading to a positive feedback effect. In other words, the more attention media allocate to a particular stock, the more likely investors will invest in that stock, and the more media will report on it again.

Looking at this theory from a communication science perspective, the effect of media attention on trading decisions is closely related to agenda-setting theory that assumes topics that are salient in the media are transferred to the public agenda (Carroll & McCombs, 2003). Thus, it can also be presumed that corporate information on stocks or on the financial market will be transferred from the media to the public (i.e., investors), which—in turn—might affect their judgments (i.e., trading decisions) (cf. Taylor, 1982).

Empirical studies dealing with media attention and its effects on stock market prices point in opposing directions. More recent research suggests, however, that the extent to which media devote attention to a stock might influence investors' trading decisions, either positively or negatively. The findings imply that the more media attention a stock receives, the higher the movement of the stock price (increase or decrease) the other day (Pinnuck, 2014). Given these incongruent findings, we want to put these findings under scrutiny in the Dutch context, posing the first research question:

RQ1: How does media attention for a stock affect the opening price of this stock the following days?

2.2. Emotions on the market

Emotions in news media and their effects on the financial market have recently received increasing attention in research (e.g., Bollen, Mao, & Zeng, 2011). In the field of behavioral finance, it was found that decisions made by investors are not solely based on objective information and fundamentals, but considerably biased by emotions and moods (De Long, Shleifer, Summer, & Waldmann, 1990). Arguing from a communication science perspective, it thus becomes crucial to examine to what extent news media convey such emotions and how this affects stock market movements. Appraisal theory can be used to explain the mechanism that connects an emotional charged news article to subsequent (trading) decisions (cf. Scherer, 1999).

2.2.1. Appraisal theory

Scherer (1999) claims that emotions do not exist as such, but are evoked and can be distinguished based on the subjective assessment of the situation, object or event with regard to a number of criteria. Given that this study is not investigating the micro-level of emotions on the financial market (i.e., investors as subjects), we rely on the approach of appraisals considered from the *dimension of meaning*. Representatives of this tradition are concerned with the analysis of semantic fields that are evinced by the usage of certain emotional words (Scherer, 1999). Put it differently, scholars try to define the feeling that results from specific emotional words (e.g., "loss" or "gain"). Thus, the more negative (or positive) emotion-words an article displays, the more negative (or positive) the reader will perceive the emotional tone of an article (Kahn, Tobin, Massey, & Anderson, 2007). Following Lerner and Keltner (2001), we assume a second step after the cognitive processes have taken