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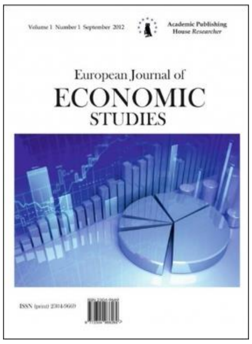

High Stock Trading Volumes before Holidays and Post-Holiday Price Drifts: Psychological Insights

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Abstract

Present study concentrates on the holiday effect on stock returns following high-volume trading days. Based on the Mood Maintenance Hypothesis and on the literature documenting lower stock trading activity before holidays, I suggest that if important company-specific news arrive immediately before a public holiday, then investors striving to maintain their positive pre-holiday mood, may be less willing to make influential trading decisions, and therefore, may react relatively more weakly to the news, which creates an underreaction and may result in subsequent price drifts. Analyzing a large sample of high-volume days and defining the latter according to two alternative proxies, I find that pre-holiday high-volume days accompanied by both positive and negative stock returns are followed by significant price drifts on the next two (post-holiday) trading days and over five- and twenty-day intervals following the initial high-volume day, the magnitude of the drifts increasing over longer time windows. On the other hand, "regular" high-volume trading days are followed by either non-significant or marginally significant price reversals. The effect is more pronounced for small and more volatile stocks and remains robust after accounting for additional company- (size, CAPM beta, historical volatility) and event-specific (stock's return on the event day) factors. It is also robust to different methods of adjusting returns and to different sample filtering criteria.

Keywords: behavioral finance, high trading volumes, holiday effect, mood maintenance hypothesis, stock price drifts, underreaction.

1. Introduction

The modern world becomes more and more information-based and information-driven. Information affects all spheres of human activity, and provides considerable advantages to people and organizations that possess it.

The role of information in financial markets is crucial. Stock market investors put a lot of effort trying to absorb any relevant item of information and to correctly incorporate it in the respective stocks' prices. In many cases, different investors possess different amounts of information and even interpret the same information differently. This kind of disagreement leads to different subjective valuations of the same stocks and gives rise to stock trading activity, continuously affecting stock trading volumes.

A vast strand of literature concentrates exactly on this point. Previous studies demonstrate that trading volume may result from some form of heterogeneity among investors, including differences in information (e.g., Varian, 1989; Holthausen, Verrecchia, 1990; Kim, Verrecchia,

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1991, 1994, 1997; Barron et al., 2005); differences in risk preferences (e.g., Beaver, 1968; Verrecchia, 1981); and differences in interpretation of company-specific news (e.g., Harris, Raviv, 1993; Kandel, Pearson, 1995; Bamber et al., 1997, 1999; Garfinkel, Sokobin, 2006; Hong, Stein, 2007; Bamber et al., 2011). Some of these studies (e.g., Verrecchia, 1981; Holthausen and Verrecchia, 1990; Kim and Verrrecchia, 1994, 1997; Barron et al., 2005) also argue that to the extent that the increase in abnormal trading volumes around company-specific events is explained by more information-based trading and/or different risk preferences, one should expect more complete price reaction, or in other words, less underreaction/more overreaction, and subsequently, a number of authors (e.g., Verrecchia, 1981; Diamond and Verrecchia, 1987; Israeli, 2015) conclude that higher abnormal trading volumes around company-specific events might be an indication that the news have been fully incorporated in stock price changes, leaving less space for post-event price drifts.

The present study follows this strand of literature, assuming that high daily stock trading volumes may serve an indication of important company-specific news arriving at the market. But what about the timing of high-volume trading days? Could there be systematic differences in stock returns following high-volume days occurring in different periods, and if the answer is positive, could these differences be used for obtaining investment profits? This study sheds some light on this question by differentiating the high-volume days taking place before public holidays from other ("regular") high-volume days.

The holiday effect is one of the most widely analyzed calendar anomalies in stock markets. Its best known aspect refers to the observed fact that stock returns typically exhibit consistent patterns around holidays, with systematically higher returns on days prior to major holidays. The holiday effect is well-documented both in the US (e.g., Lakonishok, Smidt, 1988; Kim, Park, 1994; Brockman, Michayluk, 1998) and worldwide (e.g., Agrawal, Tandon, 1994; Marrett, Worthington, 2009; Bley, Saad, 2010; Dodd, Gakhovich, 2011) stock markets. The dominating explanation for the existence of the holiday effect lies in investor psychology (e.g., Brockman, Michayluk, 1998; Vergin, McGinnis, 1999), suggesting that investors tend to buy stocks before holidays because of 'high spirits' and 'holiday euphoria' (e.g., Frieder, Subrahmanyam, 2004; Bergsma, Jiang, 2015), which cause them to expect positive returns in the sequel.

Another aspect of the holiday effect refers to the fact that stock trading volumes before public holidays tend to be lower than on "regular" days, and the bid-ask spreads before holidays tend to be higher than usual, indicating that on these days, stocks tend to be less liquid (e.g., Meneu, Pardo, 2004; Cao et al., 2009; Dodd, Gakhovich, 2011). Potential explanation for lower trading activity before holidays also emanates from investors' psychology and is based on the Mood Maintenance Hypothesis (MMH, Isen, 1984, 2000), which is a well-documented psychological pattern suggesting that people are highly motivated to maintain their positive mood states, and therefore, being in positive mood, tend to think less critically and to process information in a less detailed way, in order not to undermine their pleasant mood states (e.g., Mackie,Worth, 1989; Kuykendall, Keating, 1990; Erber, Tesser, 1992; Schwarz, 2001). In the context of the holiday effect, this means that before holidays, investors, who strive to maintain their positive mood, may be less willing to make complicated trading decisions, and therefore, trade less.

Following the above-mentioned arguments and findings, I hypothesize that if important company-specific news arrive on a trading day before a holiday, then (in line with MMH), in order not to undermine their positive pre-holiday mood, investors, or at least a part of them, may be less willing to process significant company-specific information and make influential trading decisions, and therefore, may react relatively more weakly to the news. Respectively, I expect the high-volume days occurring immediately prior to public holidays to be followed by post-holiday price drifts.

I analyze daily price data for all the constituents of S&P 500 Index over the period from 1993 to 2017, and define high-volume days according to two alternative proxies. In support of the study's hypothesis, I document that pre-holiday high-volume days accompanied by both positive and negative stock returns are followed by significant price drifts on each of the next two (post-holiday) trading days and over five- and twenty-day intervals following the event day, the magnitude of the drifts increasing over longer post-event windows. On the other hand, "regular" high-volume trading days are followed by either non-significant or marginally significant price reversals. The holiday effect on stock returns following high-volume days is found to be stronger for low capitalization and high volatility stocks, and remains robust after accounting for additional company-specific (size, CAPM beta, historical volatility) and event-specific (stock's absolute return on the event day) factors.

The rest of the paper is structured as follows. Section 2 reviews the literature dealing with stock trading volumes and their connection to stock returns, as well as the literature on different aspects of the holiday effect. Section 3 defines the study's research hypothesis. Section 4 introduces the database and the research design. Section 5 describes the empirical tests and reports the results. Section 6 concludes and provides a brief discussion.

2. Literature review

2.1. Stock trading volumes and their connection to stock returns

Prior studies suggest and discuss a number of factors that may explain and drive the trading activity. Karpoff (1986) shows that trading volume results from dispersion in prior expectations and idiosyncratic interpretations of information events. He also demonstrates that the increase in trading volume is positively correlated with the information "surprise". Furthermore, Karpoff (1987) argues that if a "surprise" is followed by stock price revision in the direction corresponding to the quality of the "surprise", then the contemporaneous trading volume increases with the absolute value of the price change. In continuation of Karpoff's line of research, Kim and Verrecchia (1991) define a measure of market's information asymmetry as a ratio of volume to the absolute value of price change. In addition, they state that volume may increase either with the absolute value of stock returns, reflecting the average change in investors' expectations, or following an increase in information asymmetry. Harris and Raviv (1993) and Kandel and Pearson (1995) assert that investors employ the same public information, but interpret it differently, a scenario which results in trading activity.

Investors may also trade for portfolio rebalancing reasons, the fact that gives rise to liquidity (or noise) trading, which is not based on information. A number of theoretical models predict that the volume of liquidity trading may be a function of past returns (e.g., DeLong et al., 1990; Hong, Stein, 1999; Hirshleifer et al., 1994, 2006). Chordia et al. (2007) conclude that liquidity trading is based on stock visibility (proxied by firm size, age, price and the book-to-market ratio), portfolio rebalancing needs, differences of opinion (proxied by forecast dispersion and firm leverage), and uncertainty about fundamental values.

Llorente et al. (2002) develop a model, in which investor's expectations of the future stock returns and exposure to the risk in equilibrium conditions are the drivers of the trading process. Baker and Stein (2004) suggest that high trading volume indicates the presence of irrational traders who push up prices (their model also involves short sale constraints). In Hong and Yu (2009), high volume indicates the presence of noise traders.

The concept of stock trading volume is closely related to the one of stock prices and returns. The early studies on volume-price relation establish that positive relations between the absolute value of daily price changes and daily volumes are present for both market indices and individual stocks (e.g., Ying, 1966; Westerfield, 1977; Rutledge, 1984; Karpoff, 1987; Schwert, 1989; Gallant et al., 1992). Additionally, Epps (1975, 1977) demonstrates that both in the stock and bond markets, the ratio of volume to absolute price change is larger for transactions when a security price rises than when it falls. Another group of studies point out at a positive relationship between absolute price changes and contemporaneous volume changes (e.g., Crouch, 1970; Epps, Epps, 1977; Harris, 1983).

More recent studies put more focus on different kinds of lag or inter-day relations between stock returns and trading volumes (e.g., Chen et al., 2001; Khan, Rizwan, 2001; Lee, Rui, 2002; Pisedtasalasai, Gunasekarage, 2007), and introduce additional relevant factors into their analysis. Ziebart (1990) states that the trading volume is positively correlated with the absolute changes in the mean analyst forecasts. Saatccioglu and Starks (1998) document that volume leads stock price changes in four out of the six emerging markets. Campbell et al. (1993) and Llorente et al. (2002) report the dynamic relation between volume and returns in the cross-section. Griffin et al. (2007) analyze the dynamic relation between market-wide trading activity and returns in 46 markets and detect a strong positive relationship between turnover and past returns. Statman et al. (2006) and Glaser and Weber (2009) obtain similar results.

Pathirawasam (2011) finds that stock returns are positively related to the contemporary changes in trading volumes. Moreover, he documents that past trading volume changes are negatively related to stock returns, and argues that this negative relationship may be caused by investor misspecification about future earnings or illiquidity of low volume stocks. Caginalpa and Desantisa (2011) point out that if the stock price is growing, but the trading volume is declining, then stock price growth is considered by technical analysts as unstable. Remorov (2014) constructs a model of stock price and volume behavior during market crashes and finds that trading volume is inversely proportional to the square of the stock price in the case of the sharp price declines, the result being empirically supported by price and volume data for major recent US stock bankruptcies and market crashes.

A vast strand of literature deals with trading volumes around company-specific events Previous research identifies three major sources of these abnormally high trading volumes, all stemming from some form of heterogeneity among investors: (i) differences in information (e.g., Varian, 1989; Holthausen, Verrecchia, 1990; Kim, Verrecchia, 1991, 1994, 1997; Barron et al., 2005); (ii) differing risk preferences (e.g., Beaver, 1968; Verrecchia, 1981); and (iii) differences in opinion, that is, differential interpretation of the company-specific news (e.g., Harris, Raviv, 1993; Kandel, Pearson, 1995; Bamber et al., 1997, 1999; Garfinkel, Sokobin, 2006; Hong, Stein, 2007; Bamber et al., 2011). Israeli (2015) analyzes trading volume reactions to earnings announcements and demonstrates that they provide information about future returns that cannot be deduced from the price reactions or the magnitudes of earnings surprises. He continues the line of literature (e.g., Verrecchia, 1981; Holthausen, Verrecchia, 1990; Kim, Verrrecchia, 1994, 1997; Barron et al., 2005), which argues that to the extent that the increase in abnormal trading volumes around company-specific events is explained by more information-based trading and/or different risk preferences, one should expect more complete price reaction and less underreaction. Consequently, in line with a number of previous studies (e.g., Verrecchia, 1981; Diamond, Verrecchia, 1987), Israeli (2015) concludes that higher abnormal trading volumes around earnings announcements might be an indication that the price changes have fully incorporated the earnings news, leaving less space for subsequent price drifts.

2.2. Holiday effect: Psychological background and financial implications

The holiday, or the pre-holiday effect, refers to the observed fact that stock returns typically exhibit consistent patterns around holidays, with systematically high returns on days prior to major holidays. The effect has been initially examined in the context of the US. In their seminal study, Lakonishok and Smidt (1988), looking at a ninety year dataset, document that the average pre-holiday rate of return equals 0.22 percent, compared with a regular daily rate of return of less than 0.01 percent. This means that pre-holiday returns are about twenty two times larger than returns on normal days, with some 63.9 percent of all returns being positive on the days before holidays. Similarly, Ariel (1990) reports that the average pre-holiday returns in the US, over the period 1963-1982, are 10 times higher than returns over the remaining days of the year. Parametric and non-parametric tests indicate that these differences are statistically significant. Likewise, Pettengill (1989) finds that returns on days immediately preceding holidays are unusually high regardless of firm size, though being more pronounced for small firms. Kim and Park (1994) likewise document the holiday effect using market indicators from all the major US stock exchanges. Brockman (1995), Brockman and Michayluk (1997) and Brockman and Michayluk (1998) demonstrate the resilience of the holiday effect, showing its persistence across market types (auction versus dealer) and size portfolios. Hirshleifer et al. (2016) point out that at the level of individual stocks, there is pre-holiday cross-sectional seasonality, wherein stocks that historically have earned higher pre-holiday returns on average earn higher pre-holiday returns for the same holiday over the next ten years.

The holiday effect has also received an increasing amount of attention outside the US, and has been documented in different countries, precluding the possibility that it reflects the idiosyncratic market characteristics of any one exchange. Cadsby and Ratner (1992) consider Canada, Japan, Hong Kong and Australia from 1962 to 1989 and test for local holidays, US holidays and joint (local-US) holidays using market indices from each country. The results indicate significant holiday effects in all of the sample markets, with the highest returns appearing on days just prior to joint holidays. Barone (1990) finds that the Italian stock market exhibits a strong holiday effect, with an average return of 0.27 % versus an average non-holiday return of – 0.01 %. In a broader study, Agrawal and Tandon (1994) examine the holiday effect in seventeen national markets, and detect significant pre-holiday strength in 65 percent of them. Marrett and Worthington (2009) document the holiday effect for Australian stock market, the magnitude of the former being higher in the retail industry. Dodd and Gakhovich (2011) show that the holiday effect is present in emerging Central and East European markets, being more pronounced in the earlier years of financial market operations.

The magnitude and statistical significance of pre-holiday returns may vary on specific holidays. Returns prior to religious holidays tend to be higher than returns before other holidays. Chan et al. (1996) demonstrate significant holiday effects before cultural holidays in Asia. More specifically, they show that in India there is a holiday effect before Hindu holidays; in Malaysia there are significant returns before Islamic New Year and Vesak; Singapore sees abnormal returns before Chinese New Year; and in Thailand small companies have significant abnormal returns before Chinese New Year. In New Zealand, the most significant returns are registered before the Easter holidays (Cao et al., 2009). Bley and Saad (2010) show significant returns before the Middle Eastern religious holidays in the Middle East.

The previous literature suggests a number of potential explanations for the existence of the holiday effect. The first one is the potential relationship between this effect and other calendar anomalies, such as the day-of-the–week effect, the monthly effect and the turn-of-the-year effect (e.g., Lakonishok, Smidt, 1988; Liano et al., 1992). These studies indicate that the high returns observed on pre-holidays are not a manifestation of other calendar anomalies. Another explanation is based on the existence of a link between the holiday effect and the small firm effect, since the former is more pronounced for small firms (e.g., Pettengill, 1989; Keef, Roush, 2005; Marrett, Worthington, 2009). Yet another explanation of the holiday effect is based on a set of different and systematic trading patterns. Keim (1989) suggests that the pre-holiday return may be, in part, due to movements from the bid to the ask price. Ariel (1990) points out that pre-holiday strength can be attributed to short-sellers who desire to close short but not long positions in advance of holidays or, simply, to some clientele which preferentially buys (or avoids selling) on pre-holidays.

Yet, arguably, the most promising explanation for abnormal positive returns prior to public holidays lies in investor psychology (e.g., Brockman, Michayluk, 1998; Vergin, McGinnis, 1999). This explanation stems from two psychology-based facts: first, that anticipation of holidays is associated with rising investors' mood (e.g., Frieder, Subrahmanyam, 2004; Bergsma, Jiang, 2015), and second, that people in good mood tend to believe in more positive outcomes (e.g., Kavanagh, Bower, 1985; Thaler, 1999). Following this line of reasoning, this group of studies suggests that investors tend to buy stocks before holidays because of ‘high spirits’ and ‘holiday euphoria’, which cause them to expect positive returns in the sequel.

An additional, less known and much less reported aspect of the holiday effect refers to the stock trading volumes before holidays. Meneu and Pardo (2004) show that abnormal trading volumes before public holidays tend to be lower than on "regular" days, and the bid-ask spreads before holidays tend to be higher than usual, indicating that on these days, stocks tend to be less liquid. Similarly, Cao et al. (2009) report that the daily de-trended trading volumes on pre-holiday trading days are generally lower than on other trading days, and subsequently conclude that investors may not be able to capture abnormal returns prior to holidays due to the low trading volume. Dodd and Gakhovich (2011) document similar results for Central and East European markets.

Potential explanation for lower trading activity before holidays also emanates from investors' psychology and is based on the Mood Maintenance Hypothesis (MMH, Isen, 1984, 2000), which is a documented psychological pattern suggesting that people are highly motivated to maintain positive mood states. Psychological literature reports that people tend to be concerned with the fact that detailed information processing might undermine pleasant mood states, and therefore, in line with the MMH, positive mood may be associated with less critical thinking and reduced information processing (Mackie, Worth, 1989; Kuykendall, Keating, 1990; Erber, Tesser, 1992; Schwarz, 2001). In the context of the holiday effect, this means that before holidays, investors, who strive to maintain their positive mood, may be less willing to make trading decisions, which are associated with information processing, and therefore, trade less.

3. Research hypothesis

The present study concentrates on the holiday effect on stock price dynamics following days characterized by extremely high trading volumes.

As discussed in the previous Section, a number of studies (e.g., Karpoff, 1987; Baker, Stein, 2004; Hong and Yu, 2009) connect stock trading volumes to the significance of the new relevant incoming information. Following this strand of literature, I assume that extremely high daily stock trading volumes serve an indication of important company-specific news arriving to the market. Furthermore, in line with another strand of literature (e.g., Meneu, Pardo, 2004; Cao et al., 2009; Dodd, Gakhovich, 2011), which documents less intense trading activity before holidays, I hypothesize that if important company-specific news arrive on a trading day before a holiday, then (in line with MMH), in order not to undermine their positive pre-holiday mood, investors, or at least a part of them, may be less willing to process significant company-specific information and make influential trading decisions, and therefore, may react relatively more weakly to the news. In other words, I expect that investors may tend to "postpone important decisions until the holidays are over", and thus, to underreact to important company-specific news arriving before holidays, making the respective stock price reactions relatively weaker than they "should have been". This hypothesis is consistent with the findings by Kudryavtsev (2017), who documents that large stock price moves taking place immediately before public holidays tend to be followed by significant post-holiday price drifts. Yet, unlike the latter study, I suggest that relatively moderate pre-holiday stock price reactions to important company-specific news may also incorporate an element of underreaction.

Respectively, since stock price underreaction to news may be expected to result in subsequent (post-holiday) price drifts, this study's main hypothesis may be formulated as follows:

Hypothesis: *Pre-holiday stock returns accompanied by extremely high stock trading volumes should be followed by post-holiday price drifts.*

4. Data description and research design

In my empirical analysis, I employ the adjusted daily price and volume data for all the constituents of S&P 500 Index, which is also used as a proxy for the general stock market index, over the period from 1993 to 2017. The data is retrieved from the Center for Research in Security Prices (CRSP). For each day characterized by extremely high trading volume in a given stock ("high-volume day", as defined in the sequel), I match the underlying firm's market capitalization, as recorded on a quarterly basis at http://ycharts.com/, for the closest preceding date.

I employ two alternative volume proxies and define day *t* as a high-volume day for stock *i* if:

Proxy A: Stock *i*'s trading volume on day *t* (VOL_{it}) was at least three times higher than the stock's average trading volume over 250 trading days preceding day *t* ($AvVol_{it}$), that is: $VOL_{it} \geq 3AvVol_{it}$.

Proxy B: Stock *i*'s trading volume on day *t* was at least five times higher than the stock's average trading volume over 250 trading days preceding day *t*, that is:

$VOL_{it} \geq 5AvVol_{it}$.

Proxy A allows to substantially increase the working sample, while proxy B concentrates on the most salient trading days in the respective stocks*.

I include high-volume days in my working sample, provided (i) there were historical trading data for at least 250 trading days before, and 20 days after the event (high-volume day); (ii) market capitalization information was available for the respective stocks; and (iii) the absolute value of the stock price change on the high-volume day did not exceed 50%. The intersection of these filtering rules yielded a working sample of the following sizes for the two definition proxies:

- For Proxy A: 12,468 high-volume days, including 557 pre-holiday and 11,911 "regular" (not preceding any holiday) high-volume days.
- For Proxy B: 5,243 high-volume days, including 248 pre-holiday and 4,995 regular high-volume days.

* I employ a number of additional volume proxies. The results for all of them (available upon request from the author) are qualitatively similar to those reported in Section 5.

US holidays examined include President's Day, Martin Luther King Jr. Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas and New Year's Day. Table 1 comprises some basic descriptive statistics of high-volume day stock returns, indicating no significant differences between pre-holiday and regular high-volume days.

In order to measure the stock price dynamics after the high-volume days, I calculate abnormal stock returns (ARs) using the Market Model with alpha and beta estimated for the respective stock over 250 trading days preceding day t*. That is, for each event i, for the period of 250 trading days preceding the event, I regress the respective stock's returns on the contemporaneous market (S&P 500 Index) returns in the following way:

$$SR_{ik} = \alpha_i + \beta_i MR_{ik} + \varepsilon_{ik} \;\; , k = t-250, \dots, t-1 \qquad (1)$$

where: SR_{ik} is the stock return on day k (k runs from t-250 to t-1) preceding event i; and MR_{ik} is the market return on day k preceding event i, and then use the regression estimates $\widehat{\alpha_i}$ and $\widehat{\beta_i}$ in order to calculate abnormal stock returns for 20 trading days following the event i, as follows:

$$AR_{il} = SR_{il} - [\widehat{\alpha_i} + \widehat{\beta_i} MR_{il}] \qquad , l = t+1, \dots, t+20 \qquad (2)$$

where: AR_{il} is the abnormal stock return on day l (l runs from t+1 to t+20) following event i.

In order to detect the holiday effect on stock returns following high-volume days, in the next Section, I analyze stock ARs during 20 trading days following the events, differentiating between pre-holiday and regular high-volume days.

5. Results description

5.1. Stock returns following high-volume days: Total sample

First of all, I employ the total sample of events (high-volume days) and analyze the respective stocks' subsequent returns. Table 2 comprises average ARs and cumulative ARs (CARs), as well as their statistical significance, for the period of up to 20 trading days following high-volume days accompanied by stock price increases and decreases, defined according to the two above-mentioned proxies. Day 1 refers to the first trading day after the high-volume day†.

The results for the total sample indicate that high-volume days, in general, are followed by either non-significant or marginally significant short-term price reversals, whose magnitude slightly increases for longer post-event time windows. The price reversals are slightly more pronounced after negative-return high-volume days, and for volume proxy B referring to the most extreme volume days, suggesting that the latter may bring with them some element of price overreaction to underlying news.

5.2. Holiday effect on stock returns following high-volume days

In order to test if the pre-holiday timing of high-volume trading days affects the respective stocks' post-event (and in this case, post-holiday) returns, I divide the total sample of high-volume days in two major subsamples: (i) high-volume days taking place immediately before a public holiday; (ii) all the other high-volume days, that is, those that took place on "regular" trading days.

Table 3 depicts average ARs following pre-holiday and regular high-volume days accompanied by positive and negative stock returns, as well as the respective AR differences and their statistical significance, for both event definition proxies. The results corroborate the study's research hypothesis with respect to the holiday effect on stock returns following high-volume days. The first thing to note is that pre-holiday high-volume days accompanied by both price increases and decreases are followed by significant post-holiday price drifts. The magnitude of these price drifts increases for longer post-event periods, so that for the post-event window 1 to 20, average CARs following pre-holiday high-volume days accompanied by price increases reach 1.92 %, and 1.93 %, according to proxies A and B, respectively, while average CARs following pre-holiday high-volume days accompanied by price decreases are even slightly more pronounced and equal – 1.98 % and – 2.02 %, according to proxies A and B, respectively, all the CARs being highly statistically significant. On the other hand, regular high-volume days accompanied by both price

* Alternatively, I calculate ARs using Market Adjusted Returns (MAR) – return differences from the market index, and the Fama-French three-factor plus momentum model. The results (available upon request from the author) remain qualitatively similar to those reported in Section 5.

† The post-event time windows are defined similarly to Kudryavtsev (2017).

increases and decreases are followed by either non-significant or marginally significant stock price reversals over all the post-event windows. Another noteworthy result refers to the fact that post-event period AR/CAR differences between the pre-holiday and regular high-volume days are highly significant and also become more pronounced for longer post-event windows. According to the event definition proxies A and B, for the Days 1 to 20, CAR differences between the two groups of events equal 2.18 % and 2.29 %, following high-volume days accompanied by price increases, and even more impressive – 2.37 % and – 2.51 %, following high-volume days accompanied by price decreases.[*] Once again, we might observe that both results are more pronounced for proxy B referring to the most extreme volume days, suggesting that the latter have an even higher chance to be accompanied by stock returns incorporating some element of overreaction to news.

5.3. Holiday effect on the post-event stock returns within different stock groups

Having detected the holiday effect on stock returns following high-volume days, I proceed to analyzing its magnitude for different categories of stocks. Namely, I classify the stocks by the firm size (market capitalization) and by historical volatility of stock returns. The motivation for this analysis arises from the findings by Baker and Wurgler (2006), who argue that low capitalization and highly volatile stocks are especially likely to be disproportionately sensitive to broad waves of investor sentiment, and by Kudryavtsev (2017), who documents that holiday effect on stock returns following large price moves is more pronounced for these categories of stocks.

First, I analyze the magnitude of the effect by firm size. For each of the event definition proxies and separately for high-volume days accompanied by positive and negative stock returns, I split the subsamples of pre-holiday and regular events into three roughly equal parts by the firms' market capitalization (high, medium and low) reported for the end of the quarter preceding each event. Table 4 reports for both event definition proxies, average post-event ARs/CARs, following pre-holiday and regular high-volume days, as well as the respective AR differences and their statistical significance, for high and low market capitalization firms. Consistently with Baker and Wurgler (2006) and Kudryavtsev (2017), the holiday effect on stock ARs following high-volume days accompanied by both price increases and decreases is stronger for low capitalization stocks. This result is twofold: (i) for small stocks, the magnitude of the price drifts following pre-holiday high-volume days is larger (e.g., according to proxies A and B, for post-event window 1 to 20, average CARs following pre-holiday high-volume days accompanied by price increases equal 1.58 % and 1.57 % for high capitalization stocks, and 2.41 % and 2.45 % for low capitalization stocks, while average CARs following pre-holiday high-volume days accompanied by price decreases equal -1.46 % and – 1.48 % for high capitalization stocks, and – 2.52 % and – 2.58 % for low capitalization stocks); and (ii) for small stocks, AR differences for the post-event period between the two subsamples of events are greater (e.g., according to proxies A and B, for post-event window 1 to 20, following high-volume days accompanied by price increases, average CAR differences between the pre-holiday and regular events are 1.76 % and 1.77 % for high capitalization stocks, and 2.76 % and 2.94% for low capitalization stocks, while following high-volume days accompanied by price decreases, average CAR differences between the pre-holiday and regular events are – 1.71 % and 1.77% for high capitalization stocks, and – 3.08 % and – 3.25 % for low capitalization stocks)[†].

Furthermore, I concentrate on the effect of historical stock volatility. For each of the event definition proxies and separately for high-volume days accompanied by positive and negative stock returns, I split the subsamples of pre-holiday and regular events into three roughly equal parts by

[*] As a robustness check, I have repeated the analysis employing two additional sample filtering criteria. Namely, I have alternatively excluded from the working sample: (i) overlapping high-volume days, defined as those that took place for the same stock within a 20-trading days window; and (ii) high-volume days for the stocks whose prices prior to the moves were lower than ten dollars. The results (available upon request from the author) are qualitatively similar, representing an additional support for the existence of the holiday effect on stock returns following high-volume days.

[†] The results for medium capitalization stocks for high-volume days accompanied by both price increases and decreases, for all the post-event windows and according to both proxies, indicate that these stocks are less influenced by the holiday effect than low capitalization stocks, and more influenced by it than high capitalization stocks. The detailed results are available upon request from the author. Overall, the results demonstrate that the holiday effect on stock ARs following high-volume days decreases with market capitalization.

the standard deviation of stock returns over Days – 250 to – 1 (high, medium and low volatility stocks)[*]. Table 5 comprises relevant AR/CAR statistics for high and low volatility stocks. Once again, in line with the previous literature, the magnitude of the holiday effect on stock returns following high-volume days, as expressed by the magnitude of post-event price drifts and the AR/CAR differences between the pre-holiday and regular events, is stronger pronounced for more volatile stocks[†].

The overall conclusion arising from this Subsection is that for low market capitalization and more volatile stocks, price reactions to important company-specific news are more affected by investors' unwillingness to make influential decisions before holidays, possibly due to the reduced amount of information on these stocks and their higher risk levels. As a result, the post-event price drifts for these stocks are more pronounced[‡].

5.4. Multifactor analysis

In this Subsection, I check the persistence of the holiday effect on stock returns following high-volume days, controlling for additional firm-specific and event-specific factors. To do so, separately for high-volume days accompanied by positive and negative stock returns, for the windows 1, 1 to 5 and 1 to 20 following the events, and according to both proxies, I run the following regressions:

$$AR_{it} = \beta_0 + \beta_1 HOLIDAY_i + \beta_2 MCap_i + \beta_3 Beta_i + \beta_4 SRVolat_i + +\beta_5 |SR0|_i + \varepsilon_{it} \qquad (3)$$

where: *ARit* is the abnormal stock return following event *i* for post-event window *t* (Days 1, 1 to 5, or 1 to 20); *HOLIDAYi* is the dummy variable, taking the value 1 if the event *i* takes place immediately before a public holiday, and 0 otherwise; *MCapi* is the natural logarithm of the firm's market capitalization corresponding to event *i*, normalized in the cross-section; *Betai* is the estimated CAPM beta for event *i*, calculated over the Days -250 to -1 and normalized in the cross-section; *SRVolati* is the standard deviation of stock returns over the Days -250 to -1 corresponding to event *i*, normalized in the cross-section; and *|SR0|i* is the absolute Day-0 stock return corresponding to event *i* (stock return on the high-volume day).

Table 6 presents the regression coefficients for all the post-event windows, indicating the following results:

- For high-volume days accompanied by stock price increases (decreases), the regression coefficients on *HOLIDAY* are positive (negative) and highly significant for all the post-event windows, which means that post-event price drifts following high-volume days accompanied by stock returns of both signs are greater if these days take place before public holidays. This result indicates that the holiday effect on stock returns following high-volume days remains significant even after controlling for additional factors affecting post-event ARs/CARs.
- For all the post-event windows following high-volume days accompanied by positive (negative) stock returns, the regression coefficients on *MCap* are significantly positive (negative), the regression coefficients on *Beta* are negative (positive) and marginally significant, and the regression coefficients on *SRVolat* are significantly negative (positive), suggesting that post-event ARs/CARs following high-volume days accompanied by stock price increases (decreases) tend to be lower (higher) for low capitalization, high-beta and highly volatile stocks. A potential reason for these results may be that investors possess less fundamental information on these groups of stocks and therefore, tend to overreact to the respective companies' events, which in turn, leads to post-

[*] The sample partition approach by both market capitalization and historical stock volatility is similar to the one employed by Kliger and Kudryavtsev (2010) and Kudryavtsev (2017).

[†] The results for medium volatility stocks for high-volume days accompanied by both price increases and decreases, for all the post-event windows and according to both proxies and thresholds, indicate that these stocks are less influenced by the holiday effect than high volatility stocks, and more influenced by it than low volatility stocks. The detailed results are available upon request from the author. Overall, the results demonstrate that the holiday effect on stock ARs following high-volume days increases with historical stock volatility.

[‡] I have also performed the analysis of post-event ARs for three subsamples partitioned by the CAPM stock beta calculated over Days -250 to -1. In line with Baker and Wurgler (2006) and Kudryavtsev (2017), I have documented that the holiday effect on stock ARs following high-volume days increases with stock beta. The detailed results are available upon request from the author.

event price reversals. It should be noted again that the holiday effect on the post-event returns, which is manifested in price drifts after pre-holiday high-volume days, remains significant after controlling for the above-mentioned factors.

- The coefficients on $|SR0|$ are non-significant, demonstrating that post-event stock returns do not depend on the magnitude of the event-day stock returns.

6. Conclusion

In this paper, I have analyzed an additional aspect of the holiday effect. Namely, I explored the effect of investors' positive pre-holiday mood on stock returns high-volume trading days. Following the Mood Maintenance Hypothesis, I suggested that if significant company-specific news arrive before a holiday, then investors striving to maintain their positive pre-holiday mood may be less willing to make influential trading decisions, and therefore, may react relatively more weakly (in fact, underreact) to the news. Therefore, since stock price underreaction to news is recognized to result in subsequent price drifts, I hypothesized that pre-holiday high-volume days should be followed by significant post-holiday price drifts.

The results of the empirical analysis supported the study's hypothesis. Analyzing a large sample of high-volume days and defining the latter according to two alternative proxies, I documented that pre-holiday high-volume accompanied by both positive and negative stock returns are followed by significant post-holiday price drifts on the next two trading days and over five- and twenty-day intervals following the event, the magnitude of the drifts increasing over longer post-event windows, while other (regular) high-volume days are followed by either non-significant or marginally significant price reversals.

Furthermore, I established that the holiday effect on stock returns following high-volume days was of higher magnitude for low capitalization firms and stocks with higher volatility of historical returns, implying that investors' mood may have a stronger impact on low market capitalization and more volatile stocks, possibly due to the reduced amount of fundamental information on these stocks and their higher risk levels. Moreover, this effect remained significant after accounting for additional company-specific (size, CAPM beta, historical volatility) and event-specific (stock's absolute return on the event day) factors. The results proved to be robust to different methods of adjusting returns, such as market-adjusted returns, market-model excess returns, and Fama-French three-factor model excess returns, and to different sample filtering criteria.

To summarize, at least in a perfect stock market with no commissions, the strategy based on buying (selling short) stocks after pre-holiday high-volume days accompanied by positive (negative) stock returns looks promising. This may appear to be a valuable result for both financial theoreticians in their eternal discussion about stock market efficiency, and practitioners in search of potentially profitable investment strategies. Potential directions for further research may include expanding the analysis to other stock exchanges, performing a separate analysis for different holidays and for the periods of bull and bear market.

References

Agrawal, Tandon, 1994 – *Agrawal, A, Tandon K.* (1994). Anomalies or Illusions? Evidence from Stock Markets in Eighteen Countries. *Journal of International Money and Finance*, 13(1), 83-106.

Ariel, 1990 – *Ariel, R.A.* (1990). High Stock Returns before Holidays: Existence and Evidence on Possible Causes. *Journal of Finance*, 45(5), 1611-1626.

Baker, Stein, 2004 – Baker, M., Stein J. (2004). Market Liquidity as a Sentiment Indicator. *Journal of Financial Markets*, 7(3), 271-299.

Baker, Wurgler, 2006 – Baker, M., Wurgler J. (2006). Investor Sentiment and the Cross-Section of Stock Returns. *Journal of Finance*, 61(4), 1645-1680.

Bamber et al., 1997 – *Bamber, L.S., Barron O.E., Stober T.L.* (1997). Trading Volume and Different Aspects of Disagreement Coincident with Earnings Announcements. *The Accounting Review*, 72(4), 575-597.

Bamber et al., 1999 – Bamber, L.S., Barron O.E., Stober T.L. (1999). Differential Interpretations and Trading Volume. *The Journal of Financial and Quantitative Analysis*, 34(3), 369-386.

Bamber et al., 2011 – *Bamber, L.S., Barron O.E., Stevens D.E.* (2011). Trading Volume around Earnings Announcements and Other Financial Reports: Theory, Research Design, Empirical Evidence, and Directions for Future Research. *Contemporary Accounting Research*, 28(2), 431-471.

Barone, 1990 – *Barone, E.* (1990). The Italian Stock Market: Efficiency and Calendar Anomalies. *Journal of Banking and Finance*, 14(2), 483-510.

Barron et al., 2005 – Barron, O.E., Harris, D.G., Stanford M. (2005). Evidence That Investors Trade on Private Event-Period Information around Earnings Announcements. *The Accounting Review*, 80(2), 403-421.

Beaver, 1968 – *Beaver, W.H.* (1968). The Information Content of Annual Earnings Announcements. *Empirical Research in Accounting: Selected Studies, Supplement to Journal of Accounting Research,* 6, 67–92.

Bergsma, Jiang, 2015 – *Bergsma, K., Jiang, D.* (2015). Cultural New Year Holidays and Stock Returns around the World. *Financial Management*, 45(1), 3-35.

Bley, Saad, 2010 – *Bley, J., Saad M.* (2010). Cross Cultural Differences in Seasonality. *International Review of Financial Analysis*, 19(4), 306-312.

Brockman, 1995 – *Brockman, P.* (1995). A Review and Analysis of the Holiday Effect. *Financial Markets, Institutions and Instruments*, 4(5), 37-58.

Brockman, Michayluk, 1997 – *Brockman, P., Michayluk D., Brockman, P., Michayluk D.* (1997). The Holiday Anomaly: An Investigation of Firm Size versus Share Price. *Quarterly Journal of Business and Economics*. 36(3), 23-35.

Brockman, Michayluk, 1998 – *Brockman, P., Michayluk D.* (1998). The Persistent Holiday Effect: Additional Evidence. *Applied Economics Letters*, 5(2), 205-209.

Cadsby, Ratner, 1992 – *Cadsby, C., Ratner M.* (1992). Turn of The Month and Pre Holiday Effects on Stock Returns: Some International Evidence. *Journal of Banking and Finance*, 16(3), 497-509.

Caginalpa, Desantisa, 2011 – Caginalpa, G., Desantisa M. (2011). Stock Price Dynamics: Nonlinear Trend, Volume, Volatility, Resistance and Money Supply. *Quantitative Finance*, 11(6), 849-861.

Campbell et al., 1993 – *Campbell, J.Y., Grossman S.J., Wang J.* (1993). Trading Volume and Serial Correlation in Stock Returns, *The Quarterly Journal of Economics*, 108(4), 905–939.

Cao et al., 2009 – *Cao, X., Premachandra I.M., Bharba G.S., Tang Y.P.* (2009). Firm Size and the Pre-Holiday Effect in New Zealand. *International Research Journal of Finance and Economics*, 32, 171-187.

Chan et al., 1996 – *Chan, M, A. Khanthavit, Thomas H.* (1996). Seasonality and Cultural Influences on Four Asian Stock Markets .*Asia Pacific Journal of Management*, 13(2), 1-24.

Chen et al., 2001 – *Chen, G., Firth M., Rui O.M.* (2001). The Dynamic Relation between Stock Returns, Trading Volume and Volatility. *The Financial Review*, 36(2), 153-174.

Chordia et al., 2007 – *Chordia, T., Huh, S.W., Subrahmanyam, A.* (2007). The Cross-Section of Expected Trading Activity. *Review of Financial Studies*, 30(2), 709-740.

Crouch, 1970 – Crouch, R.L. (1970). A Nonlinear Test of the Random-Walk Hypothesis. *American Economic Review*, 60(1), 199-202.

De Long et al., 1990 – De Long, B., Shleifer, A., Summers, L., Waldmann, R. (1990). Positive Feedback Investment Strategies and Destabilizing Rational Speculation. *Journal of Finance*, 45(2), 379-386.

Diamond, Verrecchia, 1987 – *Diamond, D., Verrecchia R.E.* (1987). Constraints on Short-Selling and Asset Price Adjustment to Private Information. *Journal of Financial Economics*, 18(2), 277-311.

Dodd, Gakhovich, 2011 – *Dodd, O., Gakhovich, A.* (2011). The Holiday Effect in Central and Eastern European Financial Markets. *Investment Management and Financial Innovations*, 8(4), 29-35.

Epps, 1975 – *Epps, T.W.* (1975). Security Price Changes and Transaction Volumes: Theory and Evidence. *American Economic Review*, 65(4), 586-597.

Epps, 1977 – *Epps, T.W.* (1977). Security Price Changes and Transaction Volumes: Some Additional Evidence. *Journal of Financial and Quantitative Analysis*, 12(1), 141-146.

Erber, Tesser, 1992 – *Erber, R., Tesser A.* (1992). Task Effort and the Regulation of Mood: The Absorption Hypothesis. *Journal of Experimental Social Psychology*, 28(4), 339-359.

Frieder, Subrahmanyam, 2004 – Frieder, L., Subrahmanyam A. (2004). Nonsecular Regularities in Returns and Volume. *Financial Analysts Journal*, 60(4), 29-34.

Gallant et al., 1992 – *Gallant, R., Rossi P., Tauchen G.* (1992). Stock Prices and Volume, *Review of Financial Studies*, 5(2), 199-242.

Garfinkel, Sokobin, 2006 – *Garfinkel, J.A., Sokobin J.* (2006). Volume, Opinion Divergence, and Returns: A Study of Post-Earnings Announcement Drift. *Journal of Accounting Research*, 44(1), 85-112.

Glaser, Weber, 2009 – *Glaser, M., Weber M.* (2009). Which Past Returns Affect Trading Volume? *Journal of Financial Markets*, 12(1), 1-31.

Griffin et al., 2007 – *Griffin, M., Nardari F., Stulz R.M.* (2007). Do Investors Trade More When Stocks Have Performed Well? Evidence from 46 Countries. *Review of Financial Studies*, 20(3), 905-951.

Harris, 1983 – *Harris, L.* (1983). The Joint Distribution of Speculative Prices and of Daily Trading Volume, Working Paper, University of Southern CA.

Harris, Raviv, 1993 – *Harris, M., Raviv, A.* (1993). Differences of Opinion Make a Horse Race. *Review of Financial Studies*, 6(3), 473-506.

Hirschleifer et al., 2016 – *Hirschleifer, D., Jiang, D., Meng, Y.* (2016). Mood Beta and Seasonalities in Stock Returns, Working Paper, IVEY Business School.

Hirshleifer et al., 2006 – *Hirshleifer, D., Subrahmanyam A., Titman S.* (2006). Feedback and the Success of Irrational Investors, *Journal of Financial Economics*, 81(2), 311-338.

Hirshleifer et al., 1994 – Hirshleifer, D., Subrahmanyam, A., Titman, S. (1994). Security Analysis and Trading Patterns When Some Investors Receive Information before Others. *Journal of Finance*, 49 (5), 1665-1698.

Holthausen, Verrecchia, 1990 – Holthausen, R.W., Verrecchia R.E. (1990). The Effect of Informedness and Consensus on Price and Volume Behavior. *The Accounting Review*, 65(1), 191-208.

Hong, Stein, 1999 – *Hong, H., Stein J.C.* (1999). A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets. *Journal of Finance*, 54(6), 2143-2184.

Hong, Yu, 2009 – *Hong, H., Yu J.* (2009). Gone Fishin': Seasonality in Trading Activity and Asset Prices. *Journal of Financial Markets*, 12(4), 672-702.

Isen, 1984 – *Isen, A.M.* (1984). Toward Understanding the Role of Affect in Cognition. R.S. Wyer and T. K. Srull (Eds.). Handbook of Social Cognition, Hillsdale, NJ: Erlbaum, 179-236.

Isen, 2000 – *Isen, A.M.* (2000). Positive Affect and Decision Making. In M. Lewis and J.M. Havieland (Eds.). Handbook of emotions, London: Guilford, Vol. 2, 417-435.

Israeli, 2015 – *Israeli, D.* (2015). Trading Volume Reactions to Earnings Announcements and Future Stock Returns, Working Paper, Interdisciplinary Center Herzliya.

Kandel, Pearson, 1995 – *Kandel, E., Pearson N.* (1995). Differential Interpretation of Public Signals and Trade in Speculative Markets. *Journal of Political Economy*, 103(4), 831-872.

Karpoff, 1986 – Karpoff, J.M. (1986). A Theory of Trading Volume. *Journal of Finance*, 41(5), 1069-1087.

Karpoff, 1987 – *Karpoff, J.M.* (1987). The Relation between Price Changes and Trading Volume: A Survey. *Journal of Financial and Quantitative Analysis*, 22(1), 109-126.

Kavanagh, Bower, 1985 – *Kavanagh, D.J., Bower G.H.* (1985). Mood and Self-Efficacy: Impact of Joy and Sadness on Perceived Capabilities. *Cognitive Therapy and Research*, 9(5), 507-525.

Keef, Roush, 2005 – Keef, S.P., Roush M.L. (2005). Day-of-the-Week Effects in the Pre-Holiday Returns of the Standard & Poor's 500 Stock Index. *Applied Financial Economics*, 15(1), 107-119.

Keim, 1989 – *Keim, D.B.* (1989). Trading Patterns, Bid-Ask Spreads and Estimated Security Returns: The Case of Common Stocks at Calendar Turning Points. *Journal of Financial Economics*, 25(1), 57-67.

Khan, Rizwan, 2008 – Khan, S.U., Rizwan F. (2008). Trading Volume and Stock Returns: Evidence from Pakistan's Stock Market. *International Review of Business Research Papers*, 4(2), 151-162.

Kim, Park, 1994 – *Kim, C.W., Park J.* (1994). Holiday Effects and Stock Returns: Further Evidence. *Journal of Financial and Quantitative Analysis*, 29(1), 145-157.

Kim, Verrecchia, 1991 – *Kim, O., Verrecchia R.E.* (1991). Market Reaction to Anticipated Announcements. *Journal of Financial Economics*, 30(2), 273-309.

Kim, Verrecchia, 1994 – Kim, O., Verrecchia R.E. (1994). Market Liquidity and Volume around Earnings Announcements. *Journal of Accounting and Economics*, 17(1), 41–67.

Kim, Verrecchia, 1997 – *Kim, O., Verrecchia R.E.* (1997). Pre-Announcement and Event-Period Private Information. *Journal of Accounting and Economics*, 24(3), 395-419.

Kliger, Kudryavtsev, 2010 – *Kliger, D., Kudryavtsev A.* (2010). The Availability Heuristic and Investors' Reaction to Company-Specific Events. *The Journal of Behavioral Finance*, 11(1), 50-65.

Kudryavtsev, 2017 – *Kudryavtsev, A.* (2017). "I'll Think about it Tomorrow": Price Drifts Following Large Pre-Holiday Stock Price Moves. *Review of Finance and Banking*, 9(2), 7-26.

Kuykendall, Keating, 1990 – *Kuykendall, D., Keating J.P.* (1990). Mood and Persuasion: Evidence for the Differential Impact of Positive and Negative States. *Psychology and Marketing*, 7(1), 1-9.

Lakonishok, Smidt, 1988 – *Lakonishok, J., Smidt S.* (1988). Are Seasonal Anomalies Real? A Ninety Year Perspective, *Review of Financial Studies*, 1(4), 403-425.

Lee, Rui, 2002 – *Lee, S.B., Rui O.M.* (2002). The Dynamic Relationship between Stock Return and Trading Volume: Domestic and Cross-Country Evidence. *Journal of Banking and Finance,* 26(1), 51-78.

Liano et al., 1992 – Liano, K., Marchand P.H., Huang G.C. (1992). The Holiday Effect in Stock Returns: Evidence from the OTC Market. *Review of Financial Economics*, 2(1), 45-54.

Llorente et al., 2002 – *Llorente, G., Michaely R., Saar G., Wang J.* (2002). Dynamic Volume-Return Relation of Individual Stocks. *Review of Financial Studies*, 15(4), 1005-1047.

Mackie, Worth, 1989 – *Mackie, D.M., Worth L.T.* (1989). Processing Deficits and the Mediation of Positive Affect in Persuasion, *Journal of Personality and Social Psychology*, 57(1), 27-40.

Marrett, Worthington, 2009 – *Marrett, G.K., Worthington A.C.* (2009). An Empirical Note on the Holiday Effect in the Australian Stock Market. *Applied Financial Letters*, 16(17), 1769-1772.

Meneu, Pardo, 2004 – *Meneu, V., Pardo A.* (2004). Pre-Holiday Effect, Large Trades and Small Investor Behavior. *Journal of Empirical Finance*, 11(2), 231-246.

Pathirawasam, 2011 – Pathirawasam, C. (2011). The Relationship between Trading Volume and Stock Returns. *Journal of Competitiveness*, 3(3), 41-49.

Pettengill, 1989 – *Pettengill, G.N.* (1989). Holiday Closings and Security Returns. *Journal of Financial Research*, 12(1), 57-67.

Pisedtasalasai, Gunasekarage, 2007 – *Pisedtasalasai, A., Gunasekarage* (2007). Causal and Dynamic Relationships among Stock Returns, Return Volatility and Trading Volume: Evidence from Emerging Markets in South-East Asia. *Asia-Pacific Financial Markets*, 14(4), 277-297.

Remorov, 2014 – *Remorov, R.* (2014). Stock Price and Trading Volume during Market Crashes. *International Journal of Marketing Studies*, 6(1), 21-30.

Rutledge, 1984 – Rutledge, D.J.S. (1984). Trading Volume and Price Variability: New Evidence on the Price Effects of Speculation, In Peck A. E. (ed.). *Selected Writings on Futures Markets: Research Directions in Commodity Markets*, 237-251, Chicago: Chicago Board of Trade.

Saatccioglu, Starks, 1998 – *Saatccioglu, K., Starks L.T.* (1998). The Stock Price–Volume Relationship in Emerging Stock Markets: The Case of Latin America. *International Journal of Forecasting*, 14(2), 215-225.

Schwarz, 2001 – *Schwarz, N.* (2001). Feelings as Information: Implications for Affective Influences on Information Processing, In L.L. Martin and G.L. Clore (eds.). *Theories of Mood and Cognition: A User's Guidebook*, pp. 159-176, Mahwah, NJ: Erlbaum.

Schwert, 1989 – Schwert, W. (1989). Why Does Stock Market Volatility Change Over Time? *Journal of Finance*, 44(5), 1115-1155.

Statman et al., 2006 – Statman, M., S. Thorley, and K. Vorkink, 2006, Investor Overconfidence and Trading Volume, *Review of Financial Studies*, 19(4), 1531-1565.

Thaler, 1999 – *Thaler, R.H.* (1999). The End of Behavioral Finance. *Financial Analyst Journal*, 55(6), 12-17.

Varian, 1989 – *Varian, H.R.* (1989). Differences of Opinion in Financial Markets. *Financial Risk: Theory, Evidence and Implications: Proceedings of the 11th Annual Economic Policy Conference of the Federal Reserve Bank of St. Louis*, 3–37.

Vergin, McGinnis, 1999 – *Vergin, R. C., McGinnis J.* (1999). Revisiting the Holiday Effect: Is it on Holiday? *Applied Financial Economics*, 9(3), 477-482.
Verrecchia, 1981 – *Verrecchia, R.E.* (1981). On the Relationship between Volume Reaction and Consensus of Investors: Implications for Interpreting Tests of Information Content. *Journal of Accounting Research*, 19(1), 271-283.
Westerfield, 1977 – *Westerfield, R.* (1977). The Distribution of Common Stock Price Changes: An Application of Transactions Time and Subordinated Stochastic Models. *Journal of Financial and Quantitative Analysis*, 12(5), 743-765.
Ying, 1966 – *Ying, C.C.* (1966). Stock Market Prices and Volumes of Sales. *Econometrica*, 34(3), 676-686.
Ziebart, 1990 – Ziebart, D.A. (1990). The Association between Consensus of Beliefs and Trading Activity Surrounding Earnings Announcements. *The Accounting Review*, 65(2), 477-488.

Appendix

Table 1. Comparative descriptive statistics of stock returns on pre-holiday and regular high-volume days

Statistics of stock returns	Proxy A (12,468 events)		Proxy B (5,243 events)	
	Pre-holiday (557 events)	Regular (11,911 events)	Pre-holiday (248 events)	Regular (4,995 events)
Mean, %	-0.31	-0.32	-0.33	-0.36
Median, %	-0.16	-0.19	-0.19	-0.20
Standard Deviation, %	1.61	1.45	1.67	1.56
Minimum, %	-34.25	-48.87	-34.25	-48.87
Maximum, %	32.47	41.28	32.47	41.28
Percent of positive	47.02	46.48	45.71	45.39

Table 2. Abnormal stock returns following high-volume days accompanied by positive and negative stock returns: Total sample

Panel A: High-volume days accompanied by positive stock returns		
Days relative to event	Average AR/CAR following high-volume days, % (2-tailed p-values)	
	Proxy A (5,828 events)	Proxy B (2,398 events)
1	-0.03 (34.18%)	-0.05 (27.55%)
2	-0.01 (72.84%)	-0.02 (49.67%)
1 to 5	-0.11 (27.46%)	-0.17 (21.40%)
1 to 20	-0.23 (18.62%)	-0.33 (13.78%)
Panel B: High-volume days accompanied by negative stock returns		
Days relative to event	Average AR/CAR following high-volume days, % (2-tailed p-values)	
	Proxy A (6,640 events)	Proxy B (2,845 events)
1	0.06 (19.74%)	0.08 (17.62%)

2	0.01 (93.65%)	0.01 (84.01%)
1 to 5	0.20 (18.21%)	0.27 (14.82%)
1 to 20	0.35 (12.03%)	*0.44 (9.13%)

Asterisks denote 2-tailed p-values: *p<0.10

Table 3. Abnormal stock returns following pre-holiday and regular high-volume days accompanied by positive and negative stock returns

Panel A: High-volume days accompanied by positive stock returns						
Days relative to event	Average AR/CAR following high-volume days, % (2-tailed p-values)					
	Proxy A			Proxy B		
	Pre-holiday (268 events)	Regular (5,560 events)	Difference	Pre-holiday (116 events)	Regular (2,282 events)	Difference
1	***0.89 (0.91%)	-0.05 (36.54%)	***0.94 (0.24%)	***0.91 (0.84%)	-0.08 (28.69%)	***0.99 (0.12%)
2	0.38 (12.40%)	-0.02 (47.69%)	*0.40 (7.87%)	0.37 (15.48%)	-0.03 (38.49%)	*0.40 (8.23%)
1 to 5	***1.78 (0.21%)	-0.14 (18.34%)	***1.92 (0.02%)	***1.80 (0.23%)	-0.20 (15.58%)	***2.00 (0.00%)
1 to 20	***1.92 (0.08%)	-0.26 (12.08%)	***2.18 (0.00%)	***1.93 (0.05%)	*-0.36 (9.75%)	***2.29 (0.00%)
Panel B: High-volume days accompanied by negative stock returns						
Days relative to event	Average AR/CAR following high-volume days, % (2-tailed p-values)					
	Proxy A			Proxy B		
	Pre-holiday (289 events)	Regular (6,351 events)	Difference	Pre-holiday (132 events)	Regular (2,713 events)	Difference
1	***-0.93 (0.80%)	0.08 (28.99%)	***-1.01 (0.17%)	***-0.95 (0.91%)	0.11 (24.19%)	***-1.06 (0.15%)
2	-0.41 (11.88%)	0.02 (46.67%)	*-0.43 (6.62%)	-0.42 (12.00%)	0.03 (42.17%)	*-0.45 (6.52%)
1 to 5	***-1.82 (0.10%)	0.24 (13.08%)	***-2.06 (0.00%)	***-1.88 (0.09%)	0.31 (10.97%)	***-2.19 (0.00%)
1 to 20	***-1.98 (0.04%)	*0.39 (9.54%)	***-2.37 (0.00%)	***-2.02 (0.01%)	*0.49 (8.69%)	***-2.51 (0.00%)

Asterisks denote 2-tailed p-values: *p<0.10; **p<0.05; ***p<0.01

Table 4. Abnormal stock returns following pre-holiday and regular high-volume days accompanied by positive and negative stock returns, for high and low market capitalization firms

Panel A: High-volume days accompanied by positive stock returns						
Days relative to event	Average AR/CAR following high-volume days for high/low market capitalization firms, %					
	Proxy A			Proxy B		
	Pre-holiday (89/89 events)	Regular (1,853/1,853 events)	Difference	Pre-holiday (44/44 events)	Regular (760/761 events)	Difference
1	*0.64/***1.12	-0.03/-0.09	*0.67/***1.21	*0.62/***1.19	-0.04/-0.13	*0.66/***1.32
2	0.29/0.45	0.01/-0.04	0.30/*0.49	0.21/0.52	-0.01/-0.08	0.22/*0.60
1 to 5	**1.38/***2.22	-0.07/-0.20	***1.45/***2.42	**1.37/***2.28	-0.12/-0.29	***1.49/***2.57
1 to 20	**1.58/***2.41	-0.18/*-0.35	***1.76/***2.76	**1.57/***2.45	-0.20/*-0.49	***1.77/***2.94
Panel B: High-volume days accompanied by negative stock returns						
Days relative to event	Average AR/CAR following high-volume days for high/low market capitalization firms, %					
	Proxy A			Proxy B		
	Pre-holiday (96/96 events)	Regular (2,117/2,117 events)	Difference	Pre-holiday (47/48 events)	Regular (904/904 events)	Difference
1	*-0.66/***-1.17	0.03/0.14	*-0.69/***-1.31	*-0.67/***-1.20	0.05/0.20	*-0.72/***-1.40
2	-0.24/*-0.61	0.00/0.06	-0.24/*-0.67	-0.24/*-0.63	0.01/0.07	-0.25/*-0.70
1 to 5	**-1.34/***-2.33	0.14/0.35	***-1.48/***-2.68	**-1.36/***-2.39	0.19/0.43	***-1.55/***-2.82
1 to 20	**-1.46/***-2.52	0.25/*0.56	***-1.71/***-3.08	**-1.48/***-2.58	0.29/*0.67	***-1.77/***-3.25

Asterisks denote 2-tailed p-values: *p<0.10; **p<0.05; ***p<0.01

Table 5. Abnormal stock returns following pre-holiday and regular high-volume days accompanied by positive and negative stock returns, for high and low volatility stocks

Panel A: High-volume days accompanied by positive stock returns						
Days relative to event	Average AR/CAR following high-volume days for high/low volatility stocks, %					
	Proxy A			Proxy B		
	Pre-holiday (89/89 events)	Regular (1,853/1,853 events)	Difference	Pre-holiday (44/44 events)	Regular (760/761 events)	Difference
1	**0.98/*0.71	-0.08/-0.04	**1.06/*0.75	**1.01/*0.70	-0.10/-0.05	**1.11/*0.75
2	0.43/0.30	-0.03/0.00	*0.46/0.30	0.48/0.24	-0.07/-0.02	*0.55/0.26
1 to 5	**2.05/**1.49	-0.18/-0.09	***2.23/***1.58	**2.10/**1.48	-0.26/-0.15	***2.36/***1.63
1 to 20	***2.29/**1.68	-0.31/-0.20	***2.60/***1.88	***2.32/**1.69	*-0.45/-0.23	***2.77/***1.92
Panel B: High-volume days accompanied by negative stock returns						
Days relative to event	Average AR/CAR following high-volume days for high/low volatility stocks, %					
	Proxy A			Proxy B		
	Pre-holiday (96/96 events)	Regular (2,117/2,117 events)	Difference	Pre-holiday (47/48 events)	Regular (904/904 events)	Difference

1	**-1.01/*-0.71	0.12/0.05	***-1.13/*-0.76	**-1.03/*-0.72	0.18/0.07	***-1.21/*-0.79
2	*-0.52/-0.29	0.05/0.01	*-0.57/-0.30	*-0.53/-0.30	0.06/0.01	*-0.59/-0.31
1 to 5	***-2.18/**-1.46	0.32/0.16	***-2.50/***-1.62	***-2.26/**-1.47	0.38/0.20	***-2.64/***-1.67
1 to 20	***-2.41/**-1.55	*0.51/0.29	***-2.92/***-1.84	***-2.48/**-1.56	*0.61/0.34	***-3.09/***-1.90

Asterisks denote 2-tailed p-values: *p<0.10; **p<0.05; ***p<0.01

Table 6. Multifactor regression analysis of ARs/CARs following high-volume days accompanied by positive and negative stock returns

Panel A: Large stock price increases						
Explanatory variables	Coefficient estimates, % (2-tailed p-values)					
	Dependent variable – *AR1*		Dependent variable – *CAR(1, 5)*		Dependent variable – *CAR(1, 20)*	
	Proxy A (12,468 events)	Proxy B (5,243 events)	Proxy A (12,468 events)	Proxy B (5,243 events)	Proxy A (12,468 events)	Proxy B (5,243 events)
Intercept	**-0.06 (2.08 %)	**-0.09 (1.87 %)	***-0.15 (0.54 %)	***-0.19 (0.32 %)	***-0.27 (0.05 %)	***-0.35 (0.02 %)
HOLIDAY	***0.95 (0.12 %)	***0.98 (0.08 %)	***1.93 (0.00 %)	***1.99 (0.00 %)	***2.17 (0.00 %)	***2.30 (0.00 %)
MCap	**0.28 (1.85 %)	**0.30 (1.56 %)	**0.31 (1.45 %)	**0.32 (1.34 %)	**0.30 (1.87 %)	**0.29 (2.07 %)
Beta	*-0.13 (8.25 %)	*-0.14 (8.19 %)	*-0.14 (8.21 %)	*-0.16 (7.84 %)	*-0.15 (8.47 %)	*-0.14 (8.71 %)
SRVolat	*-0.18 (6.23 %)	*-0.17 (6.87 %)	*-0.19 (5.99 %)	*-0.19 (6.30 %)	*-0.20 (5.87 %)	*-0.21 (5.66 %)
|SR0|	-0.02 (48.57 %)	-0.03 (38.56 %)	-0.04 (35.61 %)	-0.03 (44.29 %)	-0.01 (68.54 %)	-0.02 (49.01 %)
Panel B: Large stock price decreases						
Explanatory variables	Coefficient estimates, % (2-tailed p-values)					
	Dependent variable – *AR1*		Dependent variable – *CAR(1, 5)*		Dependent variable – *CAR(1, 20)*	
	Proxy A (12,468 events)	Proxy B (5,243 events)	Proxy A (12,468 events)	Proxy B (5,243 events)	Proxy A (12,468 events)	Proxy B (5,243 events)
Intercept	**0.08 (1.81 %)	**0.12 (1.11 %)	***0.25 (0.34 %)	***0.30 (0.21 %)	***0.40 (0.03 %)	***0.48 (0.00 %)
HOLIDAY	***-1.02 (0.07 %)	***-1.07 (0.04 %)	***-2.08 (0.00 %)	***-2.21 (0.00 %)	***-2.36 (0.00 %)	***-2.52 (0.00 %)
MCap	**-0.23 (3.25 %)	**-0.22 (4.02 %)	**-0.25 (2.97 %)	**-0.24 (3.51 %)	**-0.25 (3.12 %)	**-0.26 (3.23 %)
Beta	0.10 (10.73 %)	*0.12 (9.81 %)	*0.11 (9.96 %)	*0.14 (9.11 %)	*0.13 (8.69 %)	0.09 (13.22 %)
SRVolat	**0.22 (4.80 %)	**0.24 (4.13 %)	*0.21 (5.27 %)	*0.20 (5.84 %)	**0.25 (4.02 %)	**0.24 (4.61 %)

|SR0|	0.04 (37.19 %)	0.02 (56.20 %)	0.03 (29.88 %)	0.01 (78.55 %)	0.01 (92.16 %)	0.04 (31.31 %)

Asterisks denote 2-tailed p-values: *p<0.10; **p<0.05; ***p<0.01