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STOCK PRICE DYNAMICS SURROUNDING COMPANY-SPECIFIC SHOCKS[2]

In this study, I analyze the correlation between stock returns before and after major price shocks. I hypothesize that if a large price move for a given stock takes place after a short period when the stock's price moves in the same direction, then it may indicate that the fundamentals of the company-specific shock are more completely incorporated in the stock price, significantly increasing the probability of subsequent post-event price reversal. In order to test the study's hypothesis, I employ the price data for all the stocks that made up the S&P 500 Index during the period from 1993 to 2019, and define significant price moves according to a number of alternative proxies referring to both raw and abnormal stock returns. I find that both large price increases and decreases are followed by significant one to three month price reversals (drifts) if they are preceded by the same- (opposite-) sign short-term cumulative abnormal returns. The effect remains significant after accounting for additional relevant company-specific (size, Market Model beta, historical volatility) and event-specific (stock's return and trading volume on the event day) factors.
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1. Introduction

Stock prices are widely considered to reflect all the information that may be relevant for the respective stocks, both on the market-wide and the respective company's level. The question that preoccupies a large number of both financial researchers and stock market practitioners is whether the stock prices immediately incorporate all the relevant information and if there are some possibilities for gaining systematic and consistent profits based on some pre-determined and continuously repeating price patterns.

One of the issues attracting a lot of interest in this respect refers to large short-term stock price changes following various company-specific shocks.

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Extensive previous literature analyzes stock price predictability following large price changes. Several authors report subsequent reversals, and thus, conclude that the initial price moves may actually represent some kind of overreaction to the underlying shocks (e.g., Zarowin, 1989; Conrad et al., 1994; Avramov et al., 2006). A few other studies either suggest that there are no reversals after large price changes (e.g., Cox, Peterson, 1994; Lasfer et al., 2003; Mazouz et al., 2009), or establish that the reversals are non-significant or insufficient for generating profitable arbitrage opportunities (e.g., Atkins, Dyl, 1990; Park, 1995; Bremer et al., 1997). An additional strand of literature focuses on the relation between public information and major stock price changes (e.g., Pritamani, Singal, 2001; Chan, 2003; Tetlock, 2010; Savor, 2012). The overall conclusion that may be drawn based on this group of studies is that large price changes tend to be followed by price drifts if they are accompanied by public information releases, suggesting that investors generally underreact to news about price fundamentals, and by price reversals if they are not accompanied by any public news, indicating that investors may overreact to other shocks that move stock prices, such as shifts in investor sentiment or liquidity shocks.

The main goal of the present study is to analyze stock price dynamics *surrounding* large price moves. Specifically, I analyze the correlation between stock returns before and after major price shocks. I suggest that if a large price move for a given stock takes place after a short period when the stock's price moves in the same direction, then it may indicate that the fundamentals of the company-specific shock are more completely incorporated in the stock price, significantly increasing the probability of subsequent post-event price reversal.

I construct a large sample of large daily stock price moves for all S&P 500 index constituents over the period from 1993 to 2019. Consistently with the overall conclusion arising from the previous literature, for the total sample of price moves, I document either non-significant or marginally significant reversals following both positive and negative price moves. On the other hand, after classifying the sample of large stock price moves according to the magnitude of short-term stock returns preceding the price moves, I get corroborative evidence for the study's hypothesis. I establish that after large stock price increases preceded by relatively high (highest sample quintile or decile) 5- or 10-day cumulative abnormal returns (CARs), there are significantly negative average CARs over all post-event periods (one, two and three months), whose magnitude slightly increases as the post-event window is expanded. On the other hand, stocks whose 5- or 10-day CARs before large stock price increases are relatively low, experience significantly positive average post-event CARs. Symmetrically, I report that after large stock price decreases preceded by relatively low 5- or 10-day CARs, there are significantly positive average CARs over all the post-event periods, whose magnitude slightly increases as the post-event window is expanded. On the other hand, stocks whose 5- or 10-day CARs before large stock price increases are in the highest quintile or decile, exhibit significantly negative average post-event CARs. These findings may imply that if a large stock price move is preceded by the same-sign short-term stock returns, then there may be a more complete reaction, or even overreaction, to the underlying company-specific shock, so that during the subsequent period, the respective stock's price may be more likely to experience a reversal. The documented effect of short-term stock returns preceding large price moves on post-move stock price dynamics remains significant after accounting for additional company-specific (size, Market-Model beta, historical volatility) and event-specific (stock's return and trading volume on the event day) factors.

The rest of the paper is organized as follows. Section 2 discusses the previous literature focusing on stock returns after large price moves. Section 3 presents and explains the study's research hypothesis. Section 4 includes the sample description and the research design. Section 5 describes the empirical tests and reports the results. Section 6 provides some concluding remarks and a brief discussion.

2. Literature Review: Stock Returns Following Large Price Changes

Stock price dynamics following significant price changes are in the focus of a vast strand of financial literature. Numerous studies document systematic price reversals after large price moves, and subsequently suggest that the latter may contain some element of overreaction[3]. Renshaw (1984) and Bremer and Sweeney (1991) employ the 10-percent threshold for defining significant stock price declines and detect that the latter are followed by significantly positive market-adjusted returns. Howe (1986) concentrates on the most extreme events, namely weekly stock price increases and decreases of 50% or more, and reports significant price reversals that are not driven by seasonality and do not depend on the analyzed period. Brown et al. (1988) employ extremely negative one-period returns for building their working sample and study the subsequent monthly stock returns. They control for the directional effect, the magnitude effect and the intensity effect and find evidence consistent with overreaction. Zarowin (1989) also uses monthly data and employs a portfolio approach similar to DeBondt and Thaler (1985, 1987). His results point out at the existence of short-term stock market overreaction. Conrad et al. (1994) demonstrate that stock trading volumes are negatively correlated with the magnitude of price reversals for small stocks. On the other hand, Cooper (1999) argues that stock trading volumes are positively correlated with price reversals for larger stocks. Sturm (2003) documents that negative price shocks are in general followed by positive post-shock excess returns, but this relationship may be different, when the shocks are classified by several characteristics that may refer to investor confidence. Moreover, he states that larger price shocks are followed by smaller price reversals, potentially suggesting that investors may connect the former to stable causes. Avramov et al. (2006) detect that stock illiquidity is positively correlated with volume-induced price reversals.

Another group of studies do not support the existence of significant reversals following large price moves. Atkins and Dyl (1990) make an effort to construct profitable investment strategies over the first few days after extreme price declines, but do not manage to confront the Efficient Market Hypothesis. They find that if bid-ask spreads are taken into consideration, then excess returns resulting from reversals are not sufficient for generating profits. Lehmann (1990) does report the existence of short-term price reversals after negative weekly events, but concludes that the former hardly cover the transaction costs. Cox and Peterson (1994) suggest that price reversals following large price declines may be partially explained by bid-ask bounce and market liquidity. They document that the reversals tend to

[3] This inference is based on the conclusions arising from the studies that closely connect the concepts of overreaction and price reversals (e.g., DeBondt, Thaler, 1985; Lo, MacKinlay, 1990; Jegadeesh, Titman, 1993; Daniel et al., 1998; Hong, Stein, 1999).

disappear with time (4-20 days following the event), and therefore reject the overreaction hypothesis. Using the mid-point of bid-ask prices, Park (1995) continues this line of research and argues that price reversals following large price moves are partially driven by the bid-ask bounce, and that the latter practically neutralizes the profit potential embedded in the. In the same spirit, Hamelink (1999) and Fehle and Zdorovtsov (2003) detect significant post-extreme return reversals but concludes that the overreaction hypothesis cannot be supported if the bid-ask spread is taken into consideration. Even more flatly, Ratner and Leal (1998) find no evidence of any price reversals based on the trading data from emerging markets of Latin America and Asia. Bremer et al. (1997) employ Japanese stock market data and establish the existence of a reversal pattern, which is significant, but not sufficient for earning arbitrage profits. They (Lasfer et al., 2003) expand the area of analysis to both developed and emerging markets and infer that, in general, the evidence of price reversals is mixed and cannot be efficiently employed for making abnormal profits. Mazouz et al. (2009) use three alternative approaches for calculating abnormal post-event (large price move) returns. They not only fail to document the existence of price reversals, but even bring some evidence of price drifts following large price increases.

More recent studies in the field mostly concentrate on the effect of public information on stock price dynamics around large price changes. Pritamani and Singal (2001) analyze a sample of large stock price changes combined with daily news stories for the same stocks and report that large price changes accompanied by public announcements or volume increases are followed by price drifts, while large price changes that are not accompanied by any public news produce non-significant post-event abnormal returns. Chan (2003) considers news headlines for a sample of stocks that have experienced large price moves. Consistently with some of the previous literature demonstrating underreaction to news about fundamentals (e.g., Ikenberry, Ramnath, 2002; Michaely, Womack, 1999; Vega, 2006), he detects price momentum after events driven by news. On the other hand, he finds significant reversals after events, especially large price declines, taking place without any detectable public news. Chan (2003) also establishes that the effects are more pronounced for smaller and less liquid stocks. Consistently with Chan (2003), Savor (2012) finds that significant price moves accompanied by analyst recommendation revisions result in drifts, while no-information ones are followed by reversals. Importantly, the drifts are produced only when the direction of the large price change corresponds to the direction of contemporaneous change in analyst recommendation. He infers that these results may be driven by the fact that investors underreact to fundamental news and overreact to other price shocks. Similarly, Larson and Madura (2003) report that large price moves unaccompanied by public news indicate the existence of initial overreaction, while large price declines accompanied by public news display price drifts. Tetlock (2010) analyzes a large archive of public news, and suggests that reversals are significantly more pronounced after no-news days. Moreover, he concludes that for many stocks, volume-induced momentum is present only on days with public news. Kudryavtsev (2018) documents that large price moves accompanied by the same-sign contemporaneous daily market returns are followed by significant short-term price reversals, whose magnitude increases over longer post-event time intervals while large price changes accompanied by the opposite-sign contemporaneous daily market returns lead to non-significant price drifts. He explains this finding by the increased availability of positive (negative) investment outcomes on the days, when the market index rises (falls), which may

cause an overreaction to the underlying positive (negative) company-specific shock, resulting in a subsequent stock price reversal.

3. Research Hypothesis

As discussed in the previous Section, previous literature either reports price reversals following large stock price moves or gets some kind of mixed evidence. This study concentrates on a factor, that may potentially serve as an indication of overreaction to company-specific shocks and may help to predict the dynamics of stock returns following large price moves.

Namely, I suggest that if a large price move for a given stock takes place after a short period when the stock's price moves in the same direction, then it may indicate that the fundamentals of the company-specific shock are more completely incorporated in the stock price, significantly increasing the probability of subsequent post-event price reversal. In other words, I hypothesize that if an event (large stock price move) is preceded by the same-sign short-term stock returns, then there may be a more complete reaction, or even overreaction, to the underlying news, so that during the subsequent period, the respective stock's price may be more likely to experience a reversal.

Thus, the study's major research hypothesis deals with the effect of pre-event stock returns on the post-event stock price dynamics, and may be formulated as follows:

Hypothesis: *If a large stock price increase (decrease) is preceded by relatively high (low) abnormal short-term stock returns, then the stock's cumulative abnormal returns during the post-event period should be lower (higher).*

4. Data Description and Methodology

For the purposes of my research, I employ the adjusted daily price and trading volume data for all the stocks that made up the S&P 500 Index and for the index itself (employed as a proxy for the general stock market index) for the period from 1993 to 2019.[4] For each large price move (according to the definition presented later in this Section), I match the respective company's market capitalization, as recorded on a quarterly basis at http://ycharts.com/, for the closest preceding announcement date.

As a benchmark of large daily stock price changes, I employ daily raw stock returns with absolute values exceeding 10% ($|SR0_i| > 10\%$), where $SR0_i$ refers to the event-day (Day 0) stock return corresponding to the event (large stock price move) *i*. This is a commonly used threshold that is assumed to be high enough to screen out most price movements that do not reflect substantial changes either in fundamentals or in investor sentiment.[5]

[4] The price and volume data were downloaded from www.finance.yahoo.com on February 2020.

[5] Following Kudryavtsev (2018), I alternatively employ the following proxies for large stock price moves: (i) daily raw stock returns with absolute values exceeding 8%; (ii) daily raw stock returns with

In order to allow the empirical analysis, I use a number of additional filtering rules, and for each large stock price change in my working sample, make sure that (i) there were historical trading data for at least 250 trading days before, and 20 days after the event; (ii) market capitalization information was available for the respective stocks; and (iii) the absolute value of the price changes did not exceed 50%. Following these filtering rules, I construct a working sample of 4,699 large price moves, including 1,887 price increases and 2,812 price decreases.

5. Results Description

5.1. Stock returns following large price moves: Total sample

In order to estimate and quantify stock price dynamics immediately before and after large price moves, I calculate daily abnormal stock returns (ARs) employing Market Model Adjusted Returns (MMAR)[6]. I define the estimation window as days -261 to -11 preceding the event, and within this window, for each event *i*, run the following regression of the respective stock's returns on the contemporaneous market (S&P 500 Index) returns:

$$SR_{it} = \alpha_i + \beta_i MR_{it} + \varepsilon_{it} \quad (1)$$

where: *SRit* represents the stock's return on day *t* (*t* runs from -251 to -11) preceding event *i*; and *MRit* refers to the market return on day *t* preceding event *i*. Subsequently, I use the regression estimates $\widehat{\propto_i}$ and $\widehat{\beta_i}$ for calculating ARs for each of 10 days preceding event *i*, and for each of 63 days following the event, as follows:

$$AR_{it} = SR_{it} - [\widehat{\propto_i} + \widehat{\beta_i} MR_{it}] \quad (2)$$

where: *ARit* represents the abnormal stock return on day *t* following event *i* (*t* runs from -10 to 63, excluding Day 0); and *SRit* and *MRit* refer to the stock and the market returns for the respective days, following event *i*.

In order to test the study's research hypothesis, I need to estimate the post-event stock price dynamics. To do so, I employ cumulative ARs (CARs) for Days 1 to 21, Days 1 to 42 and Days 1 to 63, roughly corresponding to one month, two months and three months after the large price move, respectively.

absolute values exceeding three standard deviations of the respective stock's daily returns over 250 trading days (roughly a year) preceding the event; (iii) daily raw stock returns with absolute values exceeding four standard deviations of the respective stock's daily returns over 250 trading days (roughly a year) preceding the event; (iv) daily abnormal stock returns (calculated according to the Market Model) with absolute values exceeding 8%; and (v) daily abnormal stock returns (calculated according to the Market Model) with absolute values exceeding 8%. The results (available upon request from the author) remain qualitatively similar to those reported in Section 5.

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

Table 1 refers to the total sample of events and depicts CARs for the three specified post-event periods following large price increases and decreases, and their statistical significance. The results are in line with the findings of most of the previous studies. If the total sample of large price moves is considered, then it appears that they are followed by either non-significant or marginally significant reversals, which are slightly more pronounced following negative price moves.

5.2. Effect of short-term stock returns preceding large price moves on post-move stock price dynamics

For testing the main research hypothesis of the study, I divide the above-described sample of large stock price moves according to the magnitude of the short-term abnormal stock returns registered before the event. Table 2 presents CARs for Days 1 to 21, Days 1 to 42 and Days 1 to 63 following large price increases and decreases separately, the subsample representing the highest and the lowest 5-day pre-event CAR quintiles and deciles, and the respective CAR differences. Table 3 performs the same analysis based on the 10-day pre-event CAR classification[7]. The results support the existence of the effect of short-term pre-event returns on post-event stock price dynamics, indicating that:

- After large stock price increases preceded by the highest-quintile or decile 5- or 10-day CARs, that is, for the events characterized by a more complete price reaction to the underlying shock, there are significantly negative average CARs over all post-event periods, whose magnitude slightly increases as the post-event window is expanded. For example, the average CAR for days 1 to 63 after large stock price increases preceded by the highest-decile 5-day CARs is -1.28%. On the other hand, stocks whose 5- or 10-day CARs before large stock price increases are in the lowest quintile or decile, experience significantly positive average post-event CARs.
- Symmetrically, after large stock price decreases preceded by the lowest-quintile or decile 5- or 10-day CARs, there are significantly positive average CARs over all the post-event periods, whose magnitude slightly increases as the post-event window is expanded. For example, average CAR for days 1 to 63 after large stock price decreases preceded by the lowest-decile 5-day CARs reaches 1.52%. On the other hand, stocks whose 5- or 10-day CARs before large stock price increases are in the highest quintile or decile, exhibit significantly negative average post-event CARs.
- For both large stock price increases and decreases, average CAR differences between the events preceded by the highest- and the lowest-quintile or decile 5- or 10-day CARs, are highly significant, and their magnitude gradually increases as longer post-event periods are considered. For example, for post-event days 1 to 63, average CAR differences between large stock price increases (decreases) preceded by the highest- and the lowest-decile 5-day CARs is -2.06% (-2.20%). This result provides the major support for the

[7] In addition, I have classified large stock price moves by their 30-day pre-event CARs. The results with respect to the post-event CAR dynamics (available upon request from the author) are qualitatively similar to those presented in Section 5.

study's hypothesis, implying that post-event negative (positive) price reversals are significantly stronger for large stock price increases (decreases) preceded by relatively high (low) CARs.

5.3. Multifactor analysis

After documenting the effect of short-term stock returns preceding large price moves on post-event stock price dynamics, I test its persistence, controlling for additional, potentially relevant company- and event-specific factors. For this purpose, separately for large stock price increases and decreases, I run the following cross-sectional regressions for post-event days 1 to 21, 1 to 42 and 1 to 63:

$$CAR_{it} = \beta_0 + \beta_1 Preceding\_High_i + \beta_2 Preceding\_Low_i + \beta_3 MCap_i + \beta_4 Beta_i + \\ + \beta_5 SRVolat_i + \beta_6 |SR0|_i + \beta_7 AbVol0_i + \varepsilon_{it} \quad (3)$$

where: *CARit* represents the cumulative abnormal stock return following event *i* for the post-event window *t* (Days 1 to 21, 1 to 42 or 1 to 63); *Preceding_Highi* is the dummy variable, taking the value 1 if the 5- or 10-day CAR preceding event *i* is in the highest sample quintile, and 0 otherwise; *Preceding_Lowi* is the dummy variable, taking the value 1 if the 5- or 10-day CAR preceding event *i* is in the lowest sample quintile, and 0 otherwise[8]; *MCapi* denotes the natural logarithm of the firm's market capitalization corresponding to event *i*, normalized in the cross-section; *Betai* refers to the estimated Market Model beta for event *i*, calculated over the Days -261 to -11 and normalized in the cross-section; *SRVolati* is the standard deviation of the stock's returns over the Days -261 to -11 corresponding to event *i*, normalized in the cross-section; $|SR0|i$ represents the absolute Day-0 stock return representing event *i*; and *AbVol0i* is the abnormal Day-0 stock trading volume corresponding to event *i*, calculated as the difference between the stock's actual Day-0 trading volume and its average trading volume over Days -261 to -11, normalized by the standard deviation of its trading volume over the same estimation window.

Tables 4 and 5 report regression coefficient estimates for all the post-event windows, with 5- and 10-day pre-event periods, respectively, employed for measuring abnormal stock returns preceding the event. The results corroborate the study's hypothesis, demonstrating that:

- For the large stock price increases, with all the post-event windows being regarded, regression coefficients on *Preceding_High* are significantly negative and regression coefficients on *Preceding_Low* are significantly positive, indicating once again that negative post-event price reversals following large stock price increases are significantly more (less) pronounced if the latter are preceded by relatively high (low) short-term CARs.
- Similarly, for the large stock price decreases, with all the post-event windows being considered, regression coefficients on *Preceding_High* are significantly negative and

[8] I have repeated the regression analysis defining *Preceding_Highi* and *Preceding_Lowi* variables for the highest and the lowest pre-event CAR deciles, rather than quintiles. The results (available upon request from the author) remain qualitatively similar to those reported in Subsection 5.3.

regression coefficients on *Preceding_Low* are significantly positive, implying that positive post-event price reversals following large stock price decreases are significantly less (more) pronounced if the latter are preceded by relatively high (low) short-term CARs.

- For all the post-event windows following large stock price increases (decreases), 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). These findings suggest that large stock price increases (decreases) occurring to low capitalization, high-beta and highly volatile stocks tend to be followed by more pronounced price reversals. These results may be potentially attributed to the fact that investors probably possess less fundamental information on these groups of stocks, which makes their reaction to these companies' salient events stronger, and in some cases, probably too strong, creating a room for subsequent price reversals. Once again, we may note that the effect of the short-term pre-event stock returns on the post-event stock price dynamics remains significant after accounting for the above-mentioned factors.
- The coefficients on |*SR0*| and *ABVOL0* are non-significant, indicating that the magnitude of the initial shocks, as expressed by both stock price change itself and the trading volume at the day of the shock, does not significantly affect the magnitude of post-event stock price reversals.

6. Concluding Remarks

In this study, I analyzed the correlation between stock returns before and after major price shocks. I hypothesized that if a large price move for a given stock takes place after a short period when the stock's price moves in the same direction, then it may indicate that the fundamentals of the company-specific shock are more completely incorporated in the stock price, significantly increasing the probability of subsequent post-event price reversal.

Analyzing a vast sample of large stock price moves, I found corroborative evidence for the study's hypothesis. I documented that both large price increases and decreases are followed by significant one to three-month price reversals (drifts) if they are preceded by the same- (opposite-) sign short-term cumulative abnormal returns. The effect remained significant after accounting for additional relevant company-specific (size, Market Model beta, historical volatility) and event-specific (stock's return and trading volume on the event day) factors, and proved to be robust to different proxies for defining large price changes and to different methods of adjusting returns, such as market-adjusted returns, market-model excess returns, and Fama-French three-factor model excess returns.

Based on the study's findings, we may conclude that the strategy based on buying (selling short) stocks that have experienced large price decreases (increases) preceded by relatively low (high) short-term abnormal returns may be promising, at least in a perfect stock market with no commissions. This conclusion may be an additional challenge for the Efficient Market Hypothesis, and probably calls for some further research that may concentrate on

analyzing data from additional stock markets and differentiating between groups of stocks based on public companies' characteristics and between periods of bull and bear markets.

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Appendix

Table 1

Stock price dynamics following large stock price moves: Total sample

Days relative to event	Average CARs following large stock price moves, % (2-tailed p-values)	
	Large stock price increases	Large stock price decreases
1 to 21	-0.25	0.44
	(14.36%)	(12.61%)
1 to 42	-0.39	*0.55
	(12.08%)	(9.12%)
1 to 63	-0.41	*0.57
	(11.56%)	(9.01%)

*Asterisks denote 2-tailed p-values: *p<0.1*

Table 2

Stock price dynamics following large stock price moves as a function of 5-day CARs preceding the event

Panel A: Large stock price increases						
Days relative to event	Average post-event CARs, % (2-tailed p-values)					
	5-day pre-event CAR quintile			5-day pre-event CAR decile		
	Highest	Lowest	Difference	Highest	Lowest	Difference
1 to 21	***-1.12	***0.68	***-1.80	***-1.15	***0.70	***-1.85
	(0.03%)	(0.14%)	(0.00%)	(0.04%)	(0.17%)	(0.00%)
1 to 42	***-1.23	***0.74	***-1.97	***-1.26	***0.74	***-2.00
	(0.00%)	(0.06%)	(0.00%)	(0.00%)	(0.08%)	(0.00%)
1 to 63	***-1.28	***0.78	***-2.06	***-1.32	***0.80	***-2.12
	(0.00%)	(0.05%)	(0.00%)	(0.00%)	(0.03%)	(0.00%)
Panel B: Large stock price decreases						
Days relative to event	Average CARs following post-event returns, % (2-tailed p-values)					
	5-day pre-event CAR quintile			5-day pre-event CAR decile		
	Highest	Lowest	Difference	Highest	Lowest	Difference
1 to 21	***-0.62	***1.38	***-2.00	***-0.64	***1.36	***-2.00
	(0.21%)	(0.00%)	(0.00%)	(0.23%)	(0.00%)	(0.00%)
1 to 42	***-0.66	***1.45	***-2.11	***-0.67	***1.49	***-2.16
	(0.15%)	(0.00%)	(0.00%)	(0.13%)	(0.00%)	(0.00%)
1 to 63	***-0.68	***1.52	***-2.20	***-0.70	***1.55	***-2.25
	(0.10%)	(0.00%)	(0.00%)	(0.08%)	(0.00%)	(0.00%)

*Asterisks denote 2-tailed p-values: ***p<0.01*

Table 3

Stock price dynamics following large stock price moves as a function of 10-day CARs preceding the event

Panel A: Large stock price increases						
Days relative to event	Average post-event CARs, % (2-tailed p-values)					
	10-day pre-event CAR quintile			10-day pre-event CAR decile		
	Highest	Lowest	Difference	Highest	Lowest	Difference
1 to 21	***-1.14	***0.67	***-1.81	***-1.17	***0.70	***-1.87
	(0.02%)	(0.16%)	(0.00%)	(0.03%)	(0.18%)	(0.00%)
1 to 42	***-1.26	***0.75	***-2.01	***-1.28	***0.75	***-2.03
	(0.00%)	(0.05%)	(0.00%)	(0.00%)	(0.09%)	(0.00%)
1 to 63	***-1.29	***0.79	***-2.08	***-1.34	***0.81	***-2.15
	(0.00%)	(0.06%)	(0.00%)	(0.00%)	(0.03%)	(0.00%)
Panel B: Large stock price decreases						
Days relative to event	Average CARs following post-event returns, % (2-tailed p-values)					
	10-day pre-event CAR quintile			10-day pre-event CAR decile		
	Highest	Lowest	Difference	Highest	Lowest	Difference
1 to 21	***-0.63	***1.37	***-2.00	***-0.66	***1.38	***-2.04
	(0.20%)	(0.00%)	(0.00%)	(0.24%)	(0.00%)	(0.00%)
1 to 42	***-0.66	***1.48	***-2.14	***-0.69	***1.50	***-2.19
	(0.13%)	(0.00%)	(0.00%)	(0.14%)	(0.00%)	(0.00%)
1 to 63	***-0.69	***1.56	***-2.25	***-0.72	***1.58	***-2.30
	(0.11%)	(0.00%)	(0.00%)	(0.09%)	(0.00%)	(0.00%)

*Asterisks denote 2-tailed p-values: ***p<0.01*

Table 4

Multifactor regression analysis of stock price dynamics large stock price moves as a function of 5-day CARs preceding the event: Dependent variables – Stock CARs for different post-event windows

Panel A: Large stock price increases			
Explanatory variables	Coefficient estimates, % (2-tailed p-values)		
	CAR (1, 21)	CAR (1, 42)	CAR (1, 63)
Intercept	***-0.18	***-0.23	***-0.29
	(0.32%)	(0.14%)	(0.08%)
Preceding_High	***-0.93	***-0.96	***-0.98
	(0.00%)	(0.00%)	(0.00%)
Preceding_Low	***0.78	***0.85	***0.92
	(0.00%)	(0.00%)	(0.00%)
MCap	**0.24	**0.26	***0.28
	(1.23%)	(1.01%)	(0.72%)
Beta	-0.08	*-0.10	*-0.12
	(16.05%)	(9.86%)	(9.11%)
SRVolat	**-0.24	***-0.27	***-0.29
	(1.52%)	(0.92%)	(0.84%)
|SR0|	-0.05	-0.06	-0.05
	(19.85%)	(16.24%)	(20.25%)
AbVol0	0.03	0.04	0.06
	(35.19%)	(29.57%)	(18.74%)

Panel B: Large stock price decreases			
Explanatory variables	Coefficient estimates, % (2-tailed p-values)		
	CAR (1, 21)	CAR (1, 42)	CAR (1, 63)
Intercept	***0.35	***0.46	***0.48
	(0.00%)	(0.00%)	(0.00%)
Preceding_High	***-0.92	***-1.00	***-1.01
	(0.00%)	(0.00%)	(0.00%)
Preceding_Low	***0.98	***1.03	***1.07
	(0.00%)	(0.00%)	(0.00%)
MCap	***-0.37	***-0.40	***-0.41
	(0.19%)	(0.12%)	(0.10%)
Beta	0.11	*0.12	*0.14
	(12.38%)	(9.67%)	(9.23%)
SRVolat	**0.27	**0.29	**0.28
	(2.24%)	(1.81%)	(2.14%)
|SR0|	0.04	0.05	0.07
	(38.94%)	(34.58%)	(27.85%)
AbVol0	-0.04	-0.03	-0.06
	(42.30%)	(46.83%)	(27.49%)

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

Table 5

Multifactor regression analysis of stock price dynamics large stock price moves as a function of 10-day CARs preceding the event: Dependent variables – Stock CARs for different post-event windows

Panel A: Large stock price increases			
Explanatory variables	Coefficient estimates, % (2-tailed p-values)		
	CAR (1, 21)	CAR (1, 42)	CAR (1, 63)
Intercept	***-0.17	***-0.24	***-0.28
	(0.37%)	(0.12%)	(0.09%)
Preceding_High	***-0.97	***-0.98	***-1.01
	(0.00%)	(0.00%)	(0.00%)
Preceding_Low	***0.79	***0.84	***0.97
	(0.00%)	(0.00%)	(0.00%)
MCap	**0.23	***0.27	***0.29
	(1.41%)	(0.87%)	(0.68%)
Beta	-0.09	*-0.10	*-0.11
	(13.27%)	(9.71%)	(9.44%)
SRVolat	**-0.24	***-0.26	***-0.27
	(1.68%)	(0.95%)	(0.88%)
|SR0|	-0.04	-0.05	-0.04
	(23.67%)	(20.40%)	(24.32%)
AbVol0	0.04	0.03	0.05
	(31.00%)	(34.55%)	(21.75%)

Panel B: Large stock price decreases			
Explanatory variables	Coefficient estimates, % (2-tailed p-values)		
	CAR (1, 21)	CAR (1, 42)	CAR (1, 63)
Intercept	***0.36	***0.45	***0.47
	(0.00%)	(0.00%)	(0.00%)
Preceding_High	***-0.96	***-1.01	***-1.04
	(0.00%)	(0.00%)	(0.00%)
Preceding_Low	***0.99	***1.08	***1.11
	(0.00%)	(0.00%)	(0.00%)
MCap	***-0.35	***-0.39	***-0.40
	(0.27%)	(0.14%)	(0.09%)
Beta	*0.12	*0.12	0.11
	(9.67%)	(9.87%)	(11.04%)
SRVolat	**0.28	**0.30	**0.29
	(1.99%)	(1.32%)	(1.83%)
|SR0|	0.03	0.04	0.04
	(42.08%)	(37.80%)	(39.36%)
AbVol0	-0.02	-0.04	-0.03
	(47.96%)	(39.54%)	(42.37%)

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