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Full Length Article

Market reaction to grouping equities in stock markets: An empirical analysis on Borsa Istanbul

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Abstract

The main aim of this study is to investigate the market reaction to stock grouping announcements in Borsa Istanbul which requires stocks to be classified into groups “A”, “B” and “C” according to their market capitalization and floating rates. By utilizing event study analysis, our results suggest that grouping announcements have significant effect on stock prices and trading volume. The event day positive (negative) relationship between abnormal return and volume for the upgraded (downgraded) stocks supports the downward sloping demand curve hypothesis. Moreover, findings also suggest that stocks which are upgraded to Group A are exposed to more attention which is in line with the attention hypothesis. The reverse is valid for the downgraded firms. We find no evidence of price reversals and long-term symmetrical liquidity effect which lead us to reject price pressure and liquidity hypotheses. Finally, we reach controversial evidence for the information hypothesis.

Jel Classification: G11; G12; G14

Keywords: Equity grouping; Regulation; Price and volume effects

1. Introduction

Market abuse is one of the most corruptive threats to the trustworthiness of capital markets and remains a serious challenge especially in emerging ones. It consists of insider dealing and market manipulation both of which are major unlawful activities that regulatory bodies have to deal with due care and attention. The efficiency of capital markets is closely associated with the regulator's capability of detecting and taking necessary actions against such activities that take place in the market. Hence, it is important for the regulators to set up an effective regulatory framework and find appropriate ways to tackle these malpractices.

Capital Markets Board of Turkey (CMB), the regulatory body of Turkish capital markets having investigative and sanctioning powers in that respect, tries to ensure proper functioning of capital markets by means of its regulations regarding market abuse. In this paper, we try to uncover one of these regulations, the “ABC regulation”. ABC regulation requires listed firms in Borsa Istanbul (formerly known as Istanbul Stock Exchange) to be classified into “A”, “B” and “C” groups in accordance with two main criteria: market capitalization and floating rate. The motivation behind this new requirement is to prevent artificial price formations and to support efficient price discovery. According to this regulation, not only the trading hours and trading methods, but also trading principles like short selling and margin trading differ

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among groups, aiming to ensure proper price formation and inform potential investors about the risk level of the stock that they are invested within the new market microstructure.[1]

The lists of each group assigned to equities are announced by Borsa Istanbul periodically, thus some firms may experience upgrades or downgrades between groups in accordance with the criteria defined in the next section. Since such an upgrade or a downgrade sends signals to the market about the equities and also grouping changes might be of interest of institutional investors in terms of portfolio rebalancing activity, it is important to investigate the issue to uncover the potential consequences of these changes. In this context, we evaluate the effect of the ABC Regulation on stock prices and trading volumes both in the short and long term.

The main aim of this study is to investigate the effect of grouping changes on stock prices and trading volumes and discuss theoretical explanations behind the potential stock price movements. More specifically, we try to explain the relationship between grouping announcements and abnormal return and trading volume by focusing on widely cited hypotheses in the literature, though they are dedicated to index addition/deletion case. This effort is interesting for two reasons. First, as ABC regulation is unique to Turkey, we have the privilege to test the competing hypotheses for grouping equities, a very similar concept in substance when compared to index addition and deletion case since the main criteria of grouping is the market capitalization of the stocks. This specific financial microstructure gives us a valuable opportunity to extend the index addition/deletion literature to a different financial environment with a larger dataset due to high number and frequency of the announcements. Second, through revealing the side effects of regulations on stock prices, we can also provide investment recommendations to the investors and test the efficiency of the market since grouping criteria is a public information and investors can take positions even before the announcement.

Even though equity grouping is similar to index addition and deletion case, there are some significant differences. First and most important, in index addition/deletion case, one addition is matched with a deletion. However, in grouping case, there is no need to match firms since there is no capacity limit in the groups. Second, for the grouping case, there is no effective date of the announcement as the announcement takes place on the last day of each period and rules are applied on the next day after the announcement. Third, the announcement date of the grouping announcement is different than those of index addition/deletion. Considering the grouping case, groups are assigned four times a year similar to the index addition/deletion case on the last day of the each quarter.[2] On the other hand, there is no specific date for new index compositions since new index composition is announced during any of the 10-days before the effective date. Finally, if an equity is placed in Group B, C or D, investors who make first time investment in these firms (firms in Group B, C, and D) are warned about the riskiness of their investment. This is very critical since some of the investors may not be aware of the grouping changes, the particular trading rules assigned to each group and more importantly the risk level of the equities that they invest in.

The theoretical background of this study finds its roots in price pressure hypothesis, imperfect substitutes (downward sloping demand curve) hypothesis, liquidity (information cost) hypothesis, investor awareness and also information hypothesis, all of which are commonly used to evaluate impacts of index addition/deletion on stock prices. Utilizing the event study methodology, our findings suggest that grouping changes have a significant impact on both stock prices and trading volumes in the short-term. Moreover, additional tests support the downward sloping demand curve hypothesis since there is a positive (negative) relationship between abnormal return and volume for the upgraded (downgraded) stocks. In order to figure out whether this finding is an outcome of a portfolio management activity that requires fund managers to rebalance their portfolios according to the new groups, we employ difference tests governing the periods before and after grouping announcements and find additional support for downward sloping demand curve hypothesis especially in upgrade cases. Moreover, our findings also show that stocks which are upgraded (downgraded) to Group A (Group B) are exposed to more (less) attention which is in line with the attention hypothesis. Further, we find no evidence of price reversals and long-term symmetric liquidity effect, which makes us reject the price pressure and liquidity hypotheses. Lastly, there is controversial evidence of the information hypothesis. Additional tests should be applied to validate whether the grouping announcements reveal new information to the market.

This study has 7 sections. The following section presents the institutional background while literature review is presented in Section 3. Data and methodology section is given in Section 4. In Section 5 and 6, we present the findings of our study and discuss the results in the relevant context. Finally, Section 7 concludes the paper.

2. Institutional background

Capital Markets Board of Turkey (CMB) is the regulatory and supervisory authority in charge of the securities markets in Turkey. CMB has been making regulations for organizing the markets and developing capital market instruments and institutions for the past three decades. Based on the main objectives of the fair and orderly functioning of the markets and protecting the rights of investors, CMB has a wide range of responsibilities. One of these responsibilities reveals itself in market abuse transactions in the stock market. Indeed, CMB makes detailed regulations in order to prevent, monitor and supervise such actions under the cooperation of Borsa Istanbul.

[1] However, the regulation has had a recent slight change in 2014 where Group C firms have been redefined and a new category of Group D has been added to comprise firms previously classified in Group C.

[2] As of October 2014, grouping announcements take places semi-annually (on the last business day of June and December).

Company stocks are traded on Borsa Istanbul Equity Market where offers a liquid, transparent and secure trading environment for investors. Trading in the market is carried out with "continuous auction", "continuous auction with market maker" and "single price" trading methods according to price and time priority, with a fully automated electronic trading system. Trading is carried out in two sessions, one in the morning and the other in the afternoon. An "opening session" is held prior to each of the sessions, and a "closing session" is held at the end of the second session. However, these operating rules may be subject to change in certain conditions such as in case a specific CMB regulation is enforced. ABC Regulation, dated 23 July 2010, is such a specific regulation which completely changes the rules of the game for companies in that it differentiates them from each other with respect to established trading rules. According to the ABC Regulation:

1. Group A firms are the ones that are not classified under Group B and C.
2. Group B firms are the ones possessing:
   a) market capitalization that is lower than 10 million Turkish Liras (TL) and having less than 10 million floating shares.
   b) a market capitalization that is lower than 45 million TL and a floating rate that is lower than 5%
3. Group C firms are the ones having lower than 250.000 floating shares.

Group A and B equities are traded through continuous auction, whereas Group C equities are traded by single-price auction method. Within Group C, equities in the Watchlist Companies Market are traded twice a day in the afternoon. Other Group C equities are traded at four single price sessions during the day. Additionally, investors, who want to buy equities from groups B and C for the first time, have to be informed about the risks by brokerage firms before trading. Disclosure of price levels also varies among classes. As the implementation evolved in the meantime, however, ABC Regulation had to be revised at the end of October 2014 in order to align existing requirements with new Capital Markets Law provisions and secondary legislation thereof. New ABC regulation requires that:

1. Group A firms are the ones that have a market capitalization over 30 million TL,
2. Group B firms are the ones possessing a market capitalization that is over 10 million TL but lower than 30 million TL.
3. Group C firms are the ones having a market capitalization lower than 10 million TL.
4. Other firms traded in specific markets such as Emerging Companies Market, Free Trade Platform and Watchlist Companies Market are classified separately in Group D.

Though trading rules have been also revised, the ones pertaining to Group A and B, which constitute our mainstays of this paper, have had almost no change from a microstructural point of view.

3. Literature review

Since equity grouping regulation in Turkey is unique, to the best of our knowledge no study exists regarding the effect of investor reaction in this particular context. This regulation is a combination of market value and liquidity, which are very sensitive to market reaction towards new information, e.g. addition (upgraded) to or deletion (downgraded) from a group.

Several studies reveal the relationship between good or bad news and the stock returns and trading volumes. Of those studies, the ones pertaining to index inclusion offer a similar concept in that respect and stock grouping is akin to index inclusion in terms of the information signals to the public. Hence, it is worth to discuss these studies in order to make relevant inferences about equity grouping.

By and large, most of the prior studies focus on S&P 500 Index and rely on a few fundamental hypotheses: price pressure hypothesis, imperfect substitutes or downward sloping demand curve hypothesis, liquidity or information cost hypothesis, attention hypothesis and information or certification hypothesis, all of which can be classified under two major headings with respect to their informational contents.

3.1. Hypotheses for information-free effects

Price pressure, imperfect substitutes (downward sloping demand curve), information cost (liquidity) hypotheses, and attention (investor recognition) are grounded on the assumption that index inclusion provides no new information about future prospects of companies newly included in the index. Moreover, except information cost and attention, these hypotheses approach the subject from an index fund point of view.

In their seminal studies, Scholes (1972) and Kraus and Stoll (1972) suggest that price of a stock may increase or decrease due to large block sales of institutional investors without any new information revealed to the public. The main conclusion of their studies is that unlike the conventional assumption suggesting that the equities are close substitutes, large block sales will have an immediate effect on the stock prices due to low elasticity of the securities. In accordance with the price pressure hypothesis, as index additions occur, stock prices experience a temporary increase initially due to the fact that index funds heavily trade on newly added stocks so as not to deviate from their optimal portfolio tracking strategy. Their excess demand brings forth an upward price pressure, i.e. a demand shift, in the short term, which is inevitably offset by other investors that start to sell the stocks, as demand curves are downward sloping. Therefore, stock prices revert to the original equilibrium price subsequently to the heavy index fund trading. In other words, price pressure hypothesis advocates a downward sloping demand curve only in the short term since the excess demand is satisfied. Harris and Gurel (1986) provide the first evidence of this hypothesis where they find price increase more than 3% after addition of the stocks to the S&P 500 Index. However, this increase reverses back in two weeks. They also conclude that consistent price reversal is an indication of the information-free nature of the index additions. Peterson (2004), Elliott, Ness, Walker, and Warr (2006) are the other scholars who find evidence of price pressure hypothesis based on the S&P 500 Index. Moreover, the evidence of Biktimirov, Cowan, and Jordan (2004), Gowri Shankar and Miller (2006), Vespro (2006), Okada, Isagawa, and Fujiwara (2006), Mase (2007) and Bildik and Gülay (2008) extend the issue outside the S&P 500 Index.

Unlike the price pressure hypothesis, imperfect substitutes hypothesis or downward sloping demand curve hypothesis, supports for a permanent change in stock prices rather than a temporary one. The reasoning behind this permanent price behavior is that as index funds purchase newly indexed equities, the number of floating stocks vanishes, which in turn requires a shift in the demand curves to set a new equilibrium price unless the stocks have perfect substitutes. Shleifer (1986) comes first in examining this hypothesis while revealing that the permanent price effect is positive for inclusions and negative for deletions. Beneish and Whaley (1996), Lynch and Mendenhall (1996), Blume and Edelen (2002), and Wurgler and Zhuravskaya (2002) also posit evidence from the US consistent with this hypothesis. Studies of Kaul, Mehrotra, and Morck (2000) in Toronto, Liu (2000) in Japan and Mazouz and Saadouni (2007) in the UK support this hypothesis. Moreover, Chakrabarti, Huang, Jayaraman, and Lee (2005) address the issue for MSCI country indices for 29 countries and conclude that the evidence is likely to support the downward sloping demand curve hypothesis.

Based on the study of Amihud and Mendelson (1986), liquidity or information cost hypothesis states that an increase in trading volume depending on the addition to an index would decrease holding costs of investors, which is a component to narrow the bid/ask spread of a given stock. So, there should be a permanent increase in stock prices. Different than the information/certification hypothesis which will be discussed in the next section, the liquidity should improve without any information revealed to the public. Due to lower transaction costs of the investors, liquidity of the stocks might be improved with the increasing trading volume. Hegde and McDermott (2003) provide evidence of liquidity hypothesis. Using the sample of S&P 500 index revisions, they find a consistent increase (decrease) in stock liquidity following the additions (deletions) due to primarily decrease in the transaction costs of investors.

Relating the cost reduction assumption of the liquidity hypothesis, Merton (1987) approach the issue from a different perspective. It is argued that investment cost should be reduced for the stocks added to the index as a result of the increased investor recognition and lower required rate of return. More specifically, arming with the view that investors will hold stocks only they are aware of, they will demand a premium for the unsystematic risk (shadow cost) that they are exposed of. Therefore, stocks which are added to the index will give a signal to the investors about its existence and as a result required rate for this stock will be diminished with respect to the lower unsystematic risk. However, unlike the liquidity hypothesis, the effect should be asymmetric since investors cannot be unaware of the stocks that are delisted from the index. In other words, the effect of revision should be stronger for the stocks added to the index. Studying the index revisions of S&P 500, Chen, Noronha, and Singal (2004) provide evidence of investor awareness hypothesis. The find that there is a positive price response for the stocks added to the index. However, they do not observe any negative reaction for the deleted stock. This asymmetric price response supports the information awareness view. Consistent with the previous evidence, Liu (2011) investigate the price effect of index revisions in Nikkei 225 index and reveals that permanent price effect can be explained by the information awareness hypothesis and volatility changes. Chen and Lin (2016) also provide support for the investor awareness hypothesis on CSI 300 index revisions.

3.2. Hypotheses for information effects

Following these hypotheses that assume index inclusion is an information-free event, there are other studies suggesting that inclusion to an index provides new information about the future performance of the firms.

Information or certification hypothesis posits that index addition reveals new positive information to the public and the price effect should be permanent. This information suggests the potential success and leadership of the firm in the long term. Moreover, listed firms can raise more capital since fund raisers are more willing to lend money to the firms that are listed (Kappou, Brooks, & Ward, 2008). Dhillon and Johnson (1991) investigate the price movement of stock prices, options, and also bond around the index revisions. Contrary to other studies supporting the information-free nature of the revisions, they observe that stock prices do not revert back after the announcements, rejecting the short-term effect of the announcement. Moreover, they detect significant price response for the options and bonds around the announcement date consistent with the information hypothesis. They also conclude that the findings support the imperfect substitutes hypothesis only if stocks, options and bonds of a firm is close substitutes of each other. Denis, McConnell, Ovtchinnikov, and Yu (2003) reveal that firms added in the S&P 500 Index experience significant returns in addition to an increase in the earnings forecast and also in realized earnings. Complementing the previous studies, Kappou et al. (2008) examine the market reaction to S&P500 index additions by using a three-factor pricing model. Their findings suggest that added stocks experience higher earnings per share ratio after the inclusion which supports the information hypothesis. In one of the notable studies, Gygax and Otchere (2010) compare the information and information-free effects of the announcements and conclude that index revisions are not information-free events, however, portfolio rebalancing activities dominate the information effect. In addition, they suggest that the effect is stronger for the deleted stocks which support the view that investors react more to the bad news. In a more recent study, Kot, Leung, and Tang (2015) examine the long-term effect of index revisions on operating performance. The findings show that price reactions are mostly related to the operating performance, consistent with the information hypothesis.

We test these competing hypotheses developed for index inclusion/exclusion case in the equity grouping framework. From an "information-free event" point of view, we consider that rational investors, especially qualified ones, would keep a close eye on the groupings in order to include or exclude the firms so as to maintain their optimal portfolio strategies just as index funds and institutional investors have to follow up such a tracking strategy to avoid deviations, as well. From an "information effect" point of view, one might expect that upgrading (downgrading) indicates an improvement (deterioration) in future performance or reputation of the firm. This possibility would reveal itself in the signaling effect of the grouping announcement.

4. Data and methodology

In this section we present the data utilized in this study and our methodological approaches.

4.1. Data

The sample of this study includes all stocks listed in Borsa Istanbul which have experienced an upgrade or a downgrade according to grouping criteria since January 1st, 2011, i.e. the initial implementation date of the grouping regulation. As trading rules and regulations differ from the ones in Group A and B, we exclude the firms, which are downgraded to or upgraded from Group C or D. In other words, we only consider the shifts between Group A and Group B. Additionally; we extend our analyses to the new version of ABC Regulation and combine the firms classified in Group A and B in the old regulation with those in the new one. Old ABC Regulation requires that group classifications are announced quarterly in a year on 1st of January, April, July and October, while the new regulation requires a semi-annual disclosure made on the first day of January and July. Table 1 lists the changes year-by-year.

As it is presented in Table 1, there are 109 upgraded and 208 downgraded stocks from January 1st, 2011 to January 1st, 2017, respectively. We do not include the firms having missing historical price data, therefore our final sample reduces to 99 for the upgraded stocks and 170 for the downgraded stocks. Grouping data is obtained from the official website of Borsa Istanbul, while daily stock and index returns, trading volumes and investors data are obtained from Datastream and Bloomberg International.

4.2. Methodology

We employ event study methodology to investigate the effect of group changes on stock prices and trading volumes and to reveal whether a temporary or a permanent effect of grouping changes on stock prices and trading volumes exists. Since the announcement takes place after the closing session of the last trading day of a given month, we treat the following trading day as Day 1 in our analysis.

Table 1
Number of changes in group composition of Borsa Istanbul and final sample.

Year	Total no. of changes	Total no. of changes	Final sample	Final Sample
	Upgrade	*Downgrade*	*Upgrade*	*Downgrade*
2011	23	17	22	14
2012	6	20	5	10
2013	14	20	11	11
2014	29	30	26	20
2015	19	97	17	91
2016	15	16	15	16
2017	3	8	3	8
Total	109	208	99	170

Notes: The sample covers the period from January 2011 to January 2017. Our final sample consists of 99 upgrades from Group B to Group A and 170 downgrades from Group A to Group B. The difference between the number of changes and the final sample arises from the historical missing price data of some of the stocks.

The abnormal return is mostly defined as the deviation from the expected return, which is formulated as:

$$AR_{i,t} = R_{i,t} - ER_{i,t} \quad (1)$$

In Equation (1), $AR_{i,t}$, $R_{i,t}$ and $ER_{m,t}$ represent the abnormal return of the firm i in time t, the return of the firm i in time t and expected return of the firm i in time t, respectively. We calculate the expected return using the market model which is formulated as:

$$ER_{i,t} = \alpha + \beta R_{m,t} \quad (2)$$

To calculate the abnormal returns for each day in the event period, first we estimate α and β regressing the daily stock returns with the market returns covering 252 trading days before the event period [-10, −262]. Then we use these α and β estimates to calculate the expected return of the stock for each day in the event period as it is expressed in Equation (2). We use BIST100 index as the market proxy. We calculate cumulative abnormal returns belonging to various event periods by aggregating abnormal returns of stocks in the event period. We also calculate mean cumulative abnormal return (MCAR) of our sample by averaging the cumulative abnormal returns of the firms in a given event period. The event period covers 20 days [-10,+10], where 10 days for the pre-announcement period and 10 days for the post-announcement period. We cumulate abnormal returns from the Day −10 to Day −1 and also from Day 1 to Day 10 separately to observe the cumulative market reactions before and after the event.

In order to test whether there is abnormal trading volume around the announcement day, market-adjusted abnormal volumes are calculated in the event period. Mean abnormal trading volume is calculated in two steps as suggested by Harris and Gurel (1986). In the first step, we calculate the scaled volume trading, defined as the ratio of event day trading volume of firm i to the average stock volume of firm i over 40 days prior to the event window [-50,-11]. Since many firms experience more than one and consecutive group classification changes, we use a relatively short estimation period in order to prevent overlapping effects of the grouping announcements. In the final step, we take the average of the abnormal trading volumes of all firms in the event day as follows:

$$MAVR_t = \frac{1}{N}\sum iVR_{i,t} \tag{3}$$

where

$$VR_i^t = \frac{\frac{V_{i,t}}{V_i}}{\frac{V_{m,t}}{V_m}} \tag{4}$$

In Equation (3), $MAVR_t$ stands for the mean abnormal trading volume on day t. VR_i^t is a standardized measure of the abnormal volume of the firm i according to the market variation. The normal level of abnormal volume ratio (VR_i^t) is 1. In other words, an abnormal volume ratio equal to 1 indicates that the subject firm does not experience any abnormal trading volume effect. In Equation (4), $V_{i,t}$ and V_i represent the trading volume of firm i on day t and average abnormal trading of the firm i preceding 40 days the event period [-50,-11], respectively. $V_{m,t}$ and V_m, are the trading volume of the market (BIST100 Index) on day t and average abnormal trading of the market prior to the event period.

Moreover, we also calculate the percentages of the abnormal trading volumes greater than 1 on each event day for the upgraded firms and downgraded firms. We use z statistics to test for the significance of the percentages.

5. Findings

5.1. The price effect of upgrading announcement

Table 2 presents the mean abnormal (MAR) and mean cumulative abnormal returns (MCAR) around the announcement day (Day 1).

The event day abnormal return is about 1.5% and statistically significant at 1%. Moreover, around 60% percent of the firms in the sample experience a positive abnormal return on the event day which also justifies our finding. In other words, large mean abnormal returns on the event day are not caused by outliers. In the pre-event period, the positive reaction starts even 2 days before the announcement. It indicates that the market anticipates the group changes and reaction initiate before the announcement. Mean cumulative abnormal return reaches up to 2.5% on the 8th trading day after the announcement. We do not observe any negative significant abnormal return after the post-event period, indicating no price reversals in relatively long-term.

Mean cumulative abnormal results covering all trading days in the event period [-10,+10] is depicted in Fig. 1.

As it is seen in Fig. 1, the market starts to react to the new grouping list even before the announcement On the event day, there is a sharp increase in the stock prices for the upgraded firms. 20-days cumulative abnormal return reaches up 3.3%, which indicates that positive reaction persists even after the announcement.

Table 2
The abnormal return of the stocks upgraded to Group A from Group B.

Day	MAR (%)	t (MAR)	MCAR(%)	t (MCAR)	% AR ≥ 0	p-value
−10	−0.409	−1.630	−0.409	−1.630	37.37	0.995
−9	0.214	0.742	−0.195	−0.459	47.47	0.726
−8	0.055	0.182	−0.141	−0.295	46.46	0.789
−7	0.500*	1.676	0.359	0.600	45.45	0.842
−6	0.572*	1.899	0.931	1.383	53.54	0.273
−5	0.332	1.351	1.263*	1.725	46.46	0.789
−4	−0.060	−0.209	1.203	1.534	39.39	0.986
−3	0.088	0.313	1.292	1.645	43.43	0.920
−2	0.212	0.703	1.503*	1.782	42.42	0.946
−1	0.376	1.564	1.879**	2.009	51.52	0.420
1	1.504***	3.732	1.504***	3.732	59.60**	0.035
2	−0.108	−0.296	1.395**	2.271	37.37	0.995
3	0.004	0.019	1.400**	2.193	45.45	0.842
4	0.321	0.981	1.721**	2.571	32.32	0.999
5	0.257	0.873	1.978**	2.489	47.47	0.726
6	0.184	0.710	2.162**	2.547	51.52	0.420
7	0.204	0.684	2.366***	2.674	46.46	0.789
8	0.215	0.795	2.581***	2.731	45.45	0.842
9	−0.838**	−2.481	1.743	1.631	30.30	1.000
10	−0.268	−0.925	1.476	1.346	38.38	0.992
Event Period						
[-5,-1]	0.949*	1.6859				
[-1,+1]	1.880***	4.2725				
[-5,+5]	2.926***	2.8410				
[-10,+10]	3.355**	2.3831				

Notes: Event day is denoted as Day 1. MAR(%) and MCAR(%) represent the mean abnormal return and mean cumulative abnormal return, respectively. t(MAR) and t(MCAR) represent the t values. We divide our event period as before and after the event. Therefore, MCAR at 10th day indicates the mean cumulative abnormal return from Day 1 to Day 10. 6th column of the table shows % of abnormal returns greater than zero and z statistics which tests whether the ratio is significantly greater than zero. ***, **, and * denote the significance level at 1%, 5%, and 10% respectively. Sample includes 99 observations.

5.2. The volume effect of upgrading announcement

As it is presented in Table 3, equities upgraded to Group A from Group B experience significant abnormal trading activity

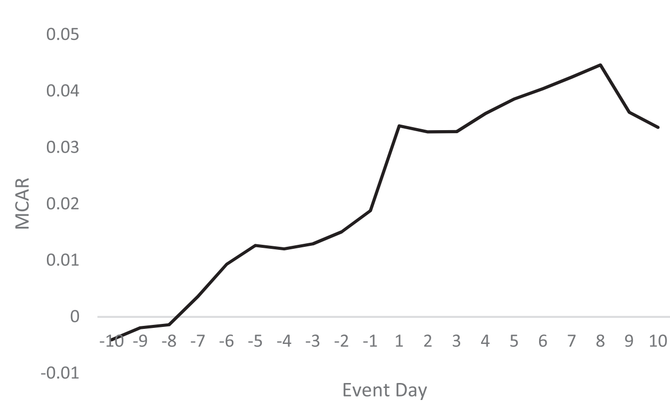

Fig. 1. Mean cumulative abnormal returns for the stocks upgraded to Group A from Group B covering the whole event period [-10, +10].

Table 3
The abnormal volume of the stocks upgraded to Group A from Group B.

Day	MAVR	z (MAVR)	%VR ≥ 1	p-value
−10	0.587***	−3.518	27.27	1.000
−9	0.725*	−1.703	36.36	0.997
−8	0.672**	−2.045	30.30	1.000
−7	0.752	−0.838	38.38	0.992
−6	0.631	0.101	37.37	0.995
−5	0.760	0.412	41.41	0.965
−4	0.659*	−1.710	33.33	0.999
−3	0.815	−1.030	34.34	0.999
−2	0.649	−0.401	33.33	0.999
−1	0.779	−1.051	37.37	0.995
1	1.492***	4.946	65.66***	0.001
2	0.888	0.998	45.45	0.842
3	0.705	0.513	42.42	0.946
4	0.909	0.576	47.47	0.726
5	0.953	0.660	45.45	0.842
6	0.837	−0.272	44.44	0.886
7	0.953*	1.843	48.48	0.656
8	0.892	0.921	46.46	0.789
9	0.888	0.900	49.49	0.579
10	0.873	0.946	44.44	0.886

Notes: Event day is denoted as Day 1. MAVR represents the median abnormal volume ratio of the sample. t(MAVR) represents the z value which test whether the median abnormal volume ratio is greater than 1 according to the Wilcoxon signed-ranks test. 4th column represents the percentages of the abnormal volumes greater than 1. Last column reports the p-values which tests whether the ratio is greater than 1. ***, **, and * denote the significance level at 1%, 5%, and 10%, respectively. Sample includes 99 observations.

on the event day. The event day median abnormal volume ratio is 1.5, means that trading volume of the upgraded firms on the event day is almost 1.5 times higher than the expected level. Around 66% of the firms in the sample have a volume ratio higher than 1 on the event day which indicates that large volume ratio is not caused by a few firms. Since our sample is highly right-skewed and there are possible outliers, we prefer to use median rather than mean. In the post-event period, median abnormal volume ratio is close to one in each of the days which indicates that high demand in the event day does not persist during the post-event period. In other words, from Day 2 to Day 10, trading volume of the upgraded stocks return to the normal levels.

5.3. The price effect of downgrading announcement

Table 4 presents mean abnormal returns and mean cumulative abnormal returns of downgrading firms around the announcement period. Results for the first trading day appear as Day 1 in Table 4. For downgrading firms, announcement day abnormal return is around −1.90% and it is statistically significant at 1%. Percentage of firms that experience a negative abnormal return on Day 1 is 85%, indicates that this finding is not caused by a few outliers. Even there are weak significant cumulative abnormal returns during the pre-event period, price reaction during the pre-event period is not clear. Moreover, no price reversal is observed in the post-event period. Mean cumulative abnormal returns reach up to −3.16% in Day 10 which indicates that market reaction

Table 4
The abnormal return of the stocks downgraded to Group B from Group A.

Day	MAR (%)	t (MAR)	MCAR(%)	t (MCAR)	% AR ≤ 0	p-value
−10	0.235	1.184	0.235	1.184	54.71	0.124
−9	−0.179	−0.863	0.056	0.224	63.53***	0.000
−8	0.064	0.312	0.120	0.357	55.88*	0.072
−7	0.701**	2.671	0.821*	1.972	42.94	0.972
−6	0.065	0.277	0.886*	1.921	55.29*	0.096
−5	−0.073	−0.414	0.813*	1.751	48.82	0.649
−4	0.213	0.868	1.026*	1.780	56.47*	0.053
−3	−0.077	−0.393	0.949	1.552	54.71	0.124
−2	−0.194	−1.027	0.755	1.206	62.94***	0.000
−1	0.513**	2.471	1.268*	1.955	50.00	0.530
1	−1.939***	−10.093	−1.939***	−10.093	85.29***	0.000
2	−0.509***	−2.973	−2.448***	−9.587	73.53***	0.000
3	−0.272	−1.577	−2.720***	−9.276	60.00***	0.005
4	−0.215	−1.167	−2.935***	−8.112	59.41***	0.008
5	0.008	0.046	−2.927***	−7.849	51.76	0.350
6	−0.132	−0.709	−3.059***	−7.493	60.00***	0.005
7	−0.336**	−1.981	−3.394***	−7.597	64.71***	0.000
8	−0.354*	−1.788	−3.748***	−6.908	68.82***	0.000
9	−0.638***	−3.379	−4.386***	−7.689	60.00***	0.005
10	−0.769**	−2.1233	−5.155***	−7.603	67.06***	0.000
Event Period						
[-5,-1]	0.382	0.8233				
[-1,+1]	−1.425***	−6.0813				
[-5,+5]	−2.545***	−4.1737				
[-10,+10]	−3.887***	−4.4453				

Notes: Event day is denoted as Day 1. MAR(%) and MCAR(%) represent the mean abnormal return and mean cumulative abnormal return, respectively. We divide our event period as before and after the event. Therefore, MCAR at 10th day indicates the mean cumulative abnormal return from Day 1 to Day 10. t(MAR) and t(MCAR) represent the t values. 6th column of the table shows % of abnormal returns lower than zero and z statistics which tests whether the ratio is significantly lower than zero. ***, **, and * denote the significance level at 1%, 5%, and 10%, respectively. Sample includes 170 observations.

continues even after the downgrading announcement. These findings suggest that event day negative abnormal return tends to persist in the following days which contradicts with the price pressure hypothesis. In order to test the price pressure hypothesis comprehensively, we present additional tests in the discussion section.

Fig. 2 depicts the mean cumulative abnormal returns for the downgraded firms covering the whole event period [-10,+10].

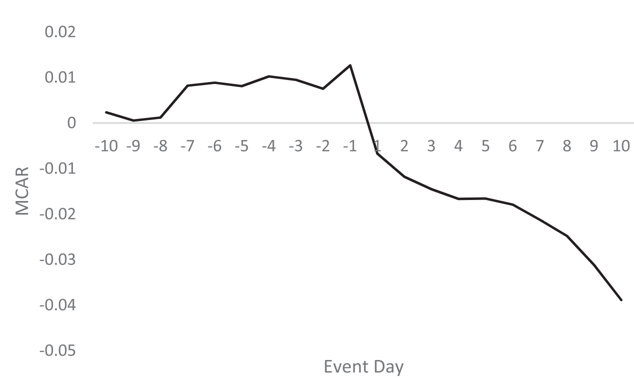

Fig. 2. Mean cumulative abnormal returns for the stocks downgraded to Group B from Group A covering the whole event period [-10, +10].

As it is seen from the graph, cumulative abnormal returns are positive before the announcement which indicates that there is no negative market reaction during the pre-event period. On the other hand, cumulative abnormal returns reach up to almost −3.89% in the post-event period which is an indication of a permanent negative market response to the downgrading announcement.

5.4. The volume effect of downgrading announcement

Table 5 presents the trading volume effect of grouping announcements around the announcement day for the downgraded firms. An interesting finding of the study reveals that on the event day (Day 1), median abnormal trading volume is not significant for the downgraded firms. On Day 1, downgraded firms experience 0.78 times lower trading volumes than the market but it is not significant. About 60% of the sample firms experience lower than 1 vol ratios. In the pre-event period, abnormal volume ratios are generally lower than 1. This finding indicates that the market anticipates the downgrading information and start to sell the stocks even 1 week before the announcement. In other words, the demand for the downgraded stocks start to diminish long before the event day. In the post-event period, the mean volume ratio is lower than 1 in all of the days, indicating a permanent volume decrease as a result of the downgrading announcement. Moreover, in all of the days in the post-event period, the percentage of the firms experiencing volume ratios lower than 1 is far higher than 0.5 which suggests that demand for the downgraded firms is persistently lower than expected levels in the post-event period.

Table 5
The abnormal volume of the stocks downgraded to Group B from Group A.

Day	MAVR	z (MAVR)	%VR ≤ 1	p-value
−10	0.598***	−3.253	70.59***	0.000
−9	0.501***	−4.440	74.12***	0.000
−8	0.571***	−3.746	73.53***	0.000
−7	0.569***	−3.231	70.59***	0.000
−6	0.920	1.179	55.29*	0.096
−5	1.087***	3.712	48.24	0.704
−4	1.214***	4.695	44.12	0.946
−3	0.962**	1.986	52.35	0.295
−2	0.675*	−1.828	64.12***	0.000
−1	1.067***	3.517	48.24	0.704
1	0.779	−1.096	61.18***	0.002
2	0.414***	−6.313	80.59***	0.000
3	0.375***	−7.697	85.29***	0.000
4	0.381***	−7.558	81.76***	0.000
5	0.383***	−6.117	80.00***	0.000
6	0.402***	−6.069	81.18***	0.000
7	0.399***	−6.523	82.35***	0.000
8	0.412***	−6.271	80.59***	0.000
9	0.434***	−5.431	78.82***	0.000
10	0.343***	−7.081	85.88***	0.000

Notes: Event day is denoted as Day 1. MAVR represents the median abnormal volume ratio of the sample. t(MAVR) represents the z value which test whether the median abnormal volume ratio is greater than 1 according to the Wilcoxon signed-ranks test. 4th column represents the percentages of the abnormal volumes greater than 1. Last column reports the p-values which tests whether the ratio is greater than 1. ***, **, and * denote the significance level at 1%, 5%, and 10%, respectively. Sample includes 170 observations.

6. Discussion

In this section, we discuss the relevant hypotheses considering the market reaction to the changes in grouping announcements.

6.1. Price pressure hypothesis

As it is shown in Figs. 1 and 2, abnormal returns tend to persist in the post-event periods, which make us rule out the price pressure hypothesis, since we do not observe any price reversals. However, in order to reach a clearer conclusion about this hypothesis, following Harris and Gurel (1986), we regress the event day abnormal returns with the abnormal returns occurred in the second day and with the cumulative abnormal returns in Day 5 and Day 10. If we were to accept the price pressure hypothesis, we should observe a significant negative relationship with the event day abnormal return and various post-event cumulative abnormal returns. The results are as follows:

Model 1: Regression between abnormal return in event day and abnormal return in Day 2

$$AR_1 = -0.006 + \underset{(2.85)}{0.215}\, AR_2$$
$$N = 269, \quad R^2 = 1.0\%$$

Model 2: Regression between abnormal return in event day and MCAR from Day 2 to Day 5

$$AR_1 = -0.006 + \underset{(1.62)}{0.067}\, MCAR_{2-5}$$
$$N = 269, \quad R^2 = 1.0\%$$

Model 3: Regression between abnormal return in event day and MCAR from Day 2 to Day 10

$$AR_1 = -0.006 + \underset{(2.53)}{0.060}\, MCAR_{2-10}$$
$$N = 269, \quad R^2 = 2.3\%$$

In all of the estimations, there is a positive relationship between the event day abnormal returns and cumulative abnormal returns in Day 2, Day 5 and Day 10, in the post-event period. These results are not consistent with the price pressure hypothesis since there are no price reversals in the post-event period. On the contrary, the positive and significant relationship between event day abnormal returns and post-event cumulative abnormal returns indicates that event day effect continues in the long run, which leads us to evaluate the other hypothesis advocating long-run permanent effect of grouping announcement.

6.2. Imperfect substitutes or downward sloping demand curve hypothesis

An important implication of the imperfect substitutes or downward sloping demand curve hypothesis is the positive relationship between the abnormal return and volume. Under this hypothesis, if demand increases (decreases) for the stocks upgraded to (downgraded from) a new group, the price should rise (drop). In other words, with any decrease in the supply of the upgraded (downgraded) stocks, the price will go up (down). To test this hypothesis, following Shleifer (1986), we regress the event day abnormal returns with the corresponding abnormal volumes to see any significant return-volume relationship. In order to accept the downward sloping demand curve hypothesis, there should be a positive (negative) relationship between the abnormal return and abnormal volume for the upgraded (downgraded) firms. Our results are as follows (t-values are in parenthesis):

Upgraded Firms

$$AR_1 = -0.009 + \underset{(3.06)}{0.020}\, AV_1$$
$$N = 99, \quad R^2 = 8.78\%$$

Downgraded Firms

$$AR_1 = -0.017 - \underset{(-2.44)}{0.012}\, AV_1$$
$$N = 170, \quad R^2 = 3.43\%$$

In both of the regressions, the coefficient of the abnormal volume has the expected sign and statistically significant at 1%. However, the relationship between abnormal return and volume for the upgraded firms is stronger according to the t-values (t-values are in parenthesis). The true coefficient of the abnormal volume should be higher due to errors in the abnormal volume estimation, which bias the coefficient towards zero (Shleifer, 1986).

When stocks are added (deleted) to (from) the index, the demand for them increases (decreases) and pushes their prices higher (lower). Moreover, event day higher than 1 abnormal volume for the upgraded (downgraded) firms along with significant positive (negative) stock return also advocate the existence of a downward sloping demand curve. As an additional test, we also check for the trading activity of institutional investors around the event day. If downward sloping demand curve hypothesis holds, then there should be an increase (decrease) in institutional ownership for upgraded (downgraded) stocks following the event. Table 6 presents our results.

As Table 6 points out, institutional investors, i.e. domestic and foreign funds, prefer to hold more (less) of relevant stocks in their portfolios following an upgrade (downgrade) event on quarterly basis. Mean difference tests, however, show that only upgrades result in statistically significant (at 10% level) changes in institutional ownership. In other words, event both upgraded and downgraded stocks experience significant changes in the institutional ownership, it is not statistically significant for the downgraded stocks. We infer from such low levels of significance that the majority of firms experiencing group changes are not favorable investments for fund portfolios probably due to the fact that they are generally considered as firms in small-cap/high risk category, thus potential impacts of funds on stock demand is somewhat limited.

Table 6
Descriptive statistics and mean differences of institutional ownership around announcement.

	Obs.	Period	Mean	Median	Mean Difference	*t*-statistic
Upgrade						
Domestic Funds (1)	21	Q_{-1}	38,683	1.81	170,570	1.609*
	21	Q_{+1}	209,253	13.354		
Foreign Funds (2)	30	Q_{-1}	1,166,593	5950	472,123	1.168
	30	Q_{+1}	1,638,716	11,720		
(1)+(2)	51	Q_{-1}	702,160	1300	347,954	1.445*
	51	Q_{+1}	1,050,114	13,354		
Downgrade						
Domestic Funds (3)	70	Q_{-1}	157,061	12,677	−17,076	−0.488
	70	Q_{+1}	139,984	15,963		
Foreign Funds (4)	73	Q_{-1}	2,659,845	25,444	−1,674,753	−1.001
	73	Q_{+1}	985,091	25,444		
(3)+(4)	143	Q_{-1}	1,434,706	15,604	−863,303	−1.011
	143	Q_{+1}	571,403	16,695		

Notes: Institutional ownership is defined as the total nominal value of shares held by domestic and/or foreign funds. 1st column shows the number of cases where institutional investments are observed in stocks. 2nd column defines the quarter before and after the event. Q_{-1} denotes for the end of quarter before the announcement and Q_{+1} denotes for the quarter in which the respective grouping announcement is made. 3rd and 4th columns display mean and median, respectively. In 5th and 6th columns, mean difference test results based upon quarterly share holdings are reported. ***, **, and * denotes for the significance level at 1%, 5% and 10%, respectively.

6.3. Liquidity or information cost hypothesis

Liquidity or information cost hypothesis suggests that with the inclusion to an index or an indexed like grouping, the stock's liquidity will increase due to close monitoring of the analysts. Moreover, this close monitoring will also increase the visibility of the stock due to increase in the flow of information to the public, decrease the monitoring and transaction costs of the stock trading and in the end will increase the liquidity of the stock permanently.

In order to investigate the permanent liquidity effect, following Liu (2000), we calculate the long-term trading volume ratios as a proxy for the increased (for upgrading stocks) or decreased (for downgraded stocks) liquidity. In short, we expand the event period up to 125 days [+1,+125] to check for the liquidity effect. However, many of the stocks experience more than one grouping changes which will make us reach misleading results due to overlapping announcement effect. In order to overcome this problem, we only consider the stocks which did not experience any grouping change 125 trading days after the announcement. Due to the high skewness of the sample, we test and report the medians rather than means. We use signed rank test to test the significance of the abnormal volume ratio. Moreover, we also report the percentage of the firms experience volume ratios greater than 1. We expect significantly higher than 1 vol ratios for the upgraded stocks and lower than 1 vol ratios for the downgraded ones. The results are as follows.

The left part of Table 7 presents the significance levels of the median volume ratios in 4 long-term event windows. The

Table 7
Long-term median abnormal volume ratios for the upgraded and downgraded firms.

Upgraded Firms (N = 37)			Downgraded Firms (N = 144)		
	Median Volume Ratio	% VR > 1		Median Volume Ratio	% VR < 1
[0,30]	1.090**	51.35	[0,30]	0.823**	63.89
[0,60]	1.010	48.65	[0,60]	0.831***	64.58
[0,100]	1.069	45.95	[0,100]	0.887**	61.81
[0,125]	1.086	48.65	[0,125]	0.909**	57.64

Notes: This table demonstrates the median abnormal volume ratios for various time intervals. % VR > 1 (%VR < 1) represent the percentage of the firms having volume ratios greater (lower) than 1. ***, **, and * denote for the significance level at 1%, 5% and 10%, respectively.

median volume ratios are greater than 1 and but only statistically significant in relatively short-term. Moreover, the percentage of the firms experience greater than 1 vol ratio is very close to 50%, do not confirm an increase in volume in the long term. Considering the median volume ratios for the downgraded firms, we can easily conclude that downgrading information decrease the demand for the downgraded firms permanently. Median volume ratios for the downgraded firms are lower than 1 and statistically significant in all of the long-term post-event windows. Further, the percentage of the firms having volume ratios lower than 1 is considerably higher than 50%, confirms our former findings. To sum up, grouping announcements have a significant negative effect on downgraded firms. On the other hand, we do not observe any significant reaction from the market for the upgraded firms in the long term. This finding does not advocate the liquidity or information cost hypothesis, which suggest a permanent liquidity increase (decrease) for the upgraded (downgraded) firms. According to this hypothesis, the magnitude of the market reaction should have been symmetrical for both upgraded and downgraded firms.

6.4. Attention or investor awareness hypothesis

Attention or investor awareness hypothesis suggests that the stocks added to an index receive more attention from investors and media which leads to lower transaction and searching costs for the potential investors. To test this hypothesis, we compare the number of investors before and after the event.[3] According to the results presented in Table 8, number of investors holding the stocks upgraded has increased about 9% after the event. This suggests that stocks promoted to Group A receive much more attention from the investors, supporting the attention hypothesis. On the other hand, similar but inverse relationship is observed for the downgraded stocks. To be more specific, number of investors after the event for downgraded firms is significantly lower than before. Although attention hypothesis does not presume a decrease in downgraded firms since investors are not unaware of these firms, this finding does not completely reject this hypothesis for two reasons. First of all, the attention from investors may be lower due to anticipation of decrease in available information about these stocks. In other words, investors may anticipate that downgraded firms will be neglected by the media and analysts, therefore they tend to sell these stocks which in turn leads to a long-term reduction in stock prices and trading volumes (Goetzmann & Garry, 1986). Second, as it is mentioned before, investors who tend to invest in stocks in Group B or lower are officially warned about the riskiness of their investment. Thus, they become *aware* of the risks attached to their investment which may affect the investment decisions of risk-averse investors. To summarize, although reduction in the number of investors for the downgraded firms seem to be in contrast to the predictions of attention hypothesis, it is not completely irrelevant from the point of investors regarding the future information flow as well as riskiness of the downgraded stock.

6.5. Information hypothesis

According to the information hypothesis, grouping changes reveals new information to the market about the future prospects of the companies. There are two alternative contradicting explanations for the information hypothesis. First, if this grouping is valuable, then upgraded (downgraded) firms should experience significant positive (negative) abnormal returns around the event day. When we look at Tables 2 and 4, we witness such a relationship. Moreover, after the group changes take place, investors are warned about the riskiness of the stocks in Group B, which might be interpreted by the potential investors as Group B firms no longer promise positive future cash flows. Further, even with the absence of new information production, a negative warning might make investors be more aware of the riskiness of their investments, which make them sell the downgraded stocks. In other words, we expect that the effect of grouping announcement in terms of new information production should be valid for only downgraded firms due to the negative warning about the riskiness of the firms in Group B. Long-term trading volume ratios support this view. As it is seen in Table 6, other than upgraded ones, downgraded firms experience significant lower trading volumes in the long term, which advocates the asymmetric nature of the announcement effect in terms of information production.

Second, the grouping criteria are public information, which makes investors react long before the announcement. Put differently, the market absorbs all information about the firms; the prices are already adjusted and reach new equilibrium even

[3] Since number of investors data is not available monthly or quarterly, we used year-end values.

Table 8
Number of investors before and after the grouping changes.

	Pre-Event	Post-Event			
	Total # of investors (a)	Total # of investors (b)	Difference (b-a)	% of firms having more investors after the grouping change	z-value
Upgraded	115,045	129,202	14,157	62	2.44**
Downgraded	302,234	300,866	−1368	30	−3.62***

Notes: This table demonstrates the number of investors before and after the grouping changes. 5th column of the table reports the percentage of the firms having more investors after the grouping change. Last column represents whether the percentage is statistically different from 0.5. ***, **, and * denote for the significance level at 1%, 5%, and 10%, respectively.

before the announcement date. Moreover, grouping criteria are only related to the market value and floating shares, therefore it is not reasonable to expect investors to react immediately with insufficient information even with a warning about the riskiness of their investment. However, there is no pre-event anomaly observed in prices for the downgraded firms, which is not in line with the information hypothesis. Even though significant event day abnormal returns without any reversal in the post-event period and low long-term liquidity for the downgraded firms support the information hypothesis, confounding findings makes the information content of the announcement questionable.

7. Conclusion

In 2010, Capital Markets Board of Turkey decided to group firms according to their current market value and shares outstanding. With this decision, the board intends to limit manipulative operations and inform the investors about the riskiness of their investments. In this study, first, the effect of grouping decision on stock returns and trading volumes are analyzed. Since this grouping settlement is very similar to the index addition/deletion case, it provides us an important opportunity to test the competing hypotheses considering a very similar but quite different and unique environment. In other words, this study expands the area of hypotheses testing about the index addition or deletion. Moreover, current study provides new evidence about an emerging market by using a larger dataset (99 additions; 170 deletions). We believe that the ABC regulation provides a unique opportunity for us to extend the index inclusion literature and to make comparative analysis in the equity-grouping framework.

Our findings suggest that stock prices and trading volumes tend to increase (decrease) for the upgraded (downgraded) firms on the first trading day after the announcement. Moreover, we also find that prices reach a new equilibrium and tend to persist in a relatively long term, which makes us refute the price pressure hypothesis. Long term high (low) trading volume ratios, which we use as a proxy for the liquidity indicates a permanent decrease for the downgraded firms which supports the liquidity or information cost hypothesis. However, we do not observe any long-term anomaly in trading volume for the upgraded firms, which makes us question this hypothesis. In order to test the imperfect substitutes or downward sloping demand curve hypothesis we use two different tests. First, we regress the event day abnormal return with the abnormal volume and find a positive (negative) relationship between the abnormal volume and return for the upgraded (downgraded) firms, which provides a support for it. As an additional test, we also calculate the institutional ownership for the stocks around the event day. Our findings suggest that, institutional ownership is higher (lower) after the event for the upgraded (downgraded) stocks, while mean ownership differences are statistically significant only in upgrade cases. Regarding the attention hypothesis, we calculate the number of investor who holds the stock before and after the event. Results suggest that, similar to institutional ownership level, number of investors of the upgraded (downgraded) stocks is higher (lower) than those of pre-event period which supports the attention hypothesis. Finally, we outline possible explanations for the information hypothesis. However, without additional tests, it is not possible to reach a clear conclusion about the information effect the announcement.

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