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The effects of information disclosure regulation on stock markets: Evidence from Vietnam

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ABSTRACT

This paper investigates the effects of regulation pertaining to information disclosure on the Vietnam stock market. Using the event study methodology, we examine sectoral reactions, in terms of risk and return, following the announcements on information disclosure regulation in Vietnam. To validate the results, we also conduct several robustness tests such as the removal of firm-specific information and the use of a wide variety of ARCH models such as GARCH (1,1). We find evidence indicating that when the market anticipates a piece of regulation on information disclosure, most sectors experience negative reactions two and five days before the first announcement. Positive reactions are observed on the event date, as well as two and five days afterwards. Furthermore, we document a difference between the Ho Chi Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) in terms of market reaction. The results also show that the sectors experience changes in short-term systematic risk. Our contributions to the literature are threefold. First, we focus on a complete and more updated set of the Vietnam stock market's information disclosure regulation. Second, our study examines the effects of a series of events on a single regulation at sectoral and firm levels in an emerging market. Third, in addition to sectoral analysis, we analyse the Vietnam stock market reaction at the firm level.

1. Introduction

The impact of regulatory announcements on stock market reaction has been examined extensively in the literature. In developed markets, for instance, Sawkins (1996); Antoniou and Pescetto (1997); Dnes et al. (1998); Robinson and Taylor (1998); Morana and Sawkins (2000) and Pescetto (2008) look at the UK market whilst Binder (1985) and Teets (1992) study the US market. In addition, many studies have examined the effects of a single regulation or a series of events pertaining to a single regulation in developed markets. In general, firms tend to face a higher level of risk when a new regulation is introduced (DeLong and Saunders, 2011; Bailey et al., 2006; Eleswarapu et al., 2004). One of the most important regulations on the stock market is information disclosure regulation as this type of regulation directly affects firms as well as investors in terms of information efficiency and transparency (i.e. reducing information asymmetry). Therefore, the wealth of shareholders is expected to change following the announcements of information

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disclosure regulation. We contribute to this debate by studying the effects of information disclosure regulation announcements on the emerging stock markets.

One of the challenging issues for emerging economies is identifying the real effect, in terms of risk and return, of regulatory changes on the stock markets. Most recently, Pham et al. (2018) and Pham et al. (2017) found mixed effects of announcements of banking regulations and stock market regulations on the Vietnam stock market. Several other studies focus on other emerging markets such as China, as well as Asian and Latin American markets (Fu and Heffernan, 2009; Lin and Zhang, 2009; Gan et al., 2014; Goddard et al., 2012). These studies, however, only focus on the effects of various types of banking and stock market regulations on the stock market reaction while the effects of a series of a single regulation on the stock market at sectoral and firm levels have not been examined closely in emerging markets.

In the aftermath of the global financial crisis, calls have arisen for stricter financial regulation to ensure the stability of the financial system. The International Monetary Fund (2009), for example, proposes that firms need to provide better information disclosure to both regulators and investors. Barth and Landsman (2010) find information disclosure about asset securitisations and derivatives to be insufficient for investors to assess banks' value and risk. Accordingly, they highlight the need for higher quality information disclosures from banks. This trend is relevant to the Vietnam stock market as the Ministry of Finance has striven to improve information disclosure since the promulgation of Circular 38/2007/TT-BTC in 2007, which pertains to the disclosure of financial information.[1] As Vietnam has been continuously improving the transparency of its stock market with a hope to achieve emerging market status, it is important to understand how the Vietnam stock market reacts to regulatory amendments. Thus, the Vietnam stock market provides an ideal testing ground for the underlying issue.

In the Vietnam context, Pham et al. (2018) examined a wide range of regulations, however, their data is limited to the period between 2007 and 2013. One of the major differences of our study from Pham et al. (2018) is that we include an important revision of the information disclosure regulation in the Vietnam stock market, which was published in 2015, whereby the disclosed information must be available in both English and Vietnamese. As a result, this revision is expected to improve information efficiency and transparency for foreign investors that could, in turn, translate into better investment decisions. Our contribution to the literature is threefold. First, we examine the effects of a series of events on a single regulation at sectoral and firm levels in an emerging market. Second, our study addresses an important series of information disclosure regulation in the Vietnam stock market that has been overlooked by the literature. Our third major contribution lies on the analysis of firm reactions within a sector and compare these reactions between the Ho Chi Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) to check if there is any significant difference between the two stock exchanges in Vietnam. Earlier studies such as Pham et al. (2017) and Pham et al. (2018) tend to combine the two Vietnam stock exchanges in their samples. Our study departs from those studies and treats the two exchanges separately in the firm level analysis. To that extent, our study focuses on the sectoral reactions following announcements on the regulation of information disclosure in the Vietnam stock market. We employ the event study methodology to estimate risk and return and conduct various robustness tests, such as those of Corrado (1989) and Chesney et al. (2011), as well as controlling for firm-specific news to validate the results. Furthermore, we examine the market anticipation to document market reactions prior to the announcements of the regulations. In general, we observe that the reaction of the Vietnamese stock market was limited to the first announcement on information disclosure regulation. Moreover, our results show that the reaction is concentrated on certain firms and the Hanoi stock exchange tends to yield negative abnormal returns.

The remaining of the study is structured as follow. Section 2 discusses the relevant studies in the literature, Section 3 presents the methodology used in this study, Section 4 and Section 5 introduces the data and discusses the empirical findings and Section 6 concludes the paper.

2. Literature review

Information disclosure is the process through which an entity communicates with investors. A proper and adequate corporate disclosure plays an important role in a free-market economy where the market allocates resources to different sectors of the economy. Baumol (1965) argued that the lack of adequate disclosure can create ignorance that results in a misallocation of resources. The disclosure of information in annual reports is intended to reduce information asymmetry. Subsequently, investors would be able to use the information for making investment decisions (Healy and Palepu, 2001; Lambert et al., 2007).

Information disclosure regulation, which comes in various forms, is consequential for financial and operational activities. Over time, firms are required to disclose to their investors more information on their operations and financial activities. Similarly, investors are required to disclose information about their holdings in firms that may pertain to activism or acquisition intentions that ultimately affect the underlying firm's value. Moreover, improved quality of public information is achieved by boosting the reliability of credit ratings and by greater disclosure of macroeconomic and industry-related information (Goldstein and Yang, 2017). Firms can also provide information disclosure through regulated financial reports such as financial statements, footnotes, management analysis and the regulatory filings of changes in the ownership structure of listed corporations. Shiri et al. (2016) find that the role of information disclosure in financial markets emerges from information asymmetry and agency problems, which lead to an inefficient allocation of resources.

Extensive research has been conducted on the effect of regulatory announcements on financial markets, the majority of which focuses on developed markets (Antoniou and Pescetto, 1997; Ikhlaas, 2014; Berk and Rauch, 2016). Although the impact of regulation on the stock return is examined by many studies, the results are still mixed. Some evidence shows that regulatory

[1] http://vbpl.vn/TW/Pages/vbpqen-toanvan.aspx?ItemID=3500&Keyword=information%20disclosure.

announcements do not lead to changes in stock returns. However, some evidence suggests that financial markets are sensitive to these announcements (Prasanna, 2011; Ramiah et al., 2013; Stigler, 1964a, 1964b).

On the other hand, the literature on this issue as it pertains to an emerging market like Vietnam is relatively thin. Recently, Pham et al. (2017) and Pham et al. (2018) investigated the market's reaction to banking and financial regulatory announcements across financial and non-financial sectors in the Vietnamese stock market. They find evidence for both negative and positive reactions as well as risk shifting behaviour in the form of a diamond risk structure. These papers, however, focus on various sets of regulations, unlike this study which considers a series of announcements on a specific regulation.

An increased awareness that potential investors have obtained through high-quality information disclosure has led to a higher demand for this kind of information (Arnold et al., 2011). In addition, Hoang (2017) finds that increased information transparency leads to a surge in trading activity. In general, information disclosure regulation is a tool that is used by the government to regulate the market, requiring regular updates to keep up with market changes. Amendment of information disclosure regulation may affect the stock market in several aspects, which provides the motivation for our study to examine if changes in information disclosure regulation influence the Vietnam stock market.

3. Methodology

Following Ramiah et al. (2013) and Pham et al. (2018), we adopt and modify the event methodology developed by Brown and Warner (1985) to examine the impact of information disclosure regulation. Firm-specific abnormal returns are calculated by using the differences between daily returns and expected returns as estimated by CAPM. Sectoral abnormal returns are then estimated by averaging the abnormal returns of each firm within a sector. The return on sector I at time t is

$$AR_{It} = \frac{\Sigma_{i=1}^{N} AR_{it}}{N} \tag{1}$$

where AR_{it} is estimated as:

$$AR_{it} = \ln\left(\frac{P_{it}}{P_{it-1}}\right) - [\beta_{it}^{0} + \beta_{it}^{1}(R_{mt} - R_{ft})] \tag{2}$$

AR_{It} is the abnormal return of sector I at time t, AR_{it} is the abnormal return of firm i at time t, N is the number of firms within a sector I, P_{it} is the price of firm i at time t adjusted for capital gains, dividends, bonus issues and rights issues, R_{mt} is the market return estimated using MSCI Vietnam, R_{ft} is the risk-free rate as proxied by the Vietnam government 10-year bond rate, β_{it}^{0} is the intercept of the CAPM (rolling over a period of the previous 260 days) and β_{it}^{1} is the beta (systematic risk) of each firm ((rolling over a period of the previous 260 days). The time series data used in this study, covering the period between 18 March 2007 and 6 November 2015, were downloaded from Datastream.

Sectoral reactions to a regulatory change can be positive, negative or mixed because a sector reacts positively if the news is favourable for them, and vice versa. A mixed reaction emerges when a sector reacts positively to one announcement and negatively to another. We employ the standard t-test to check if the abnormal returns are statistically significant. In addition, we use the non-parametric ranking test of Corrado (1989) and the non-parametric conditional distribution approach of Chesney et al. (2011) as robustness tests.

One of the problems with the event study methodology pertains to how to control for the market anticipation of the events. Thus, we estimate the cumulative abnormal returns (CAR) of two and five days before the event date to examine this effect. Moreover, we calculate the CAR of two and five days after the event date to check the presence or otherwise of information diffusion whereby the sector continues to react to the same information over the next two or five days (Hong and Stein, 1999). The standard t-test is used to determine if these results are statistically significant.

Capturing the true effects of events on the stock market may not be easy since it is difficult to separate the effects of the event from the effects of other firm-related news. For robustness, we remove all of the firms that release firm-related news, within a window of fifteen days before and after the event dates, to obtain new abnormal returns. Furthermore, the effects of changes in regulation may vary across each firm within a sector as each firm may have different characteristics. Therefore, we examine the reaction of each firm within a sector to find out how the reaction of a sector is driven. This exercise is intended to find out whether the reaction is concentrated or dispersed among firms. Moreover, we use the t-test to check the significance of the difference between the reactions of HOSE and HNX.

In addition, we examine changes in systematic risk following the regulatory announcements on information disclosures. In the stock market, regulators can allocate future costs and benefits to consumers and investors, which implies that (i) the risk of a regulated firm is endogenous, (ii) investment risk is a function of market uncertainties, and (iii) investment risk is dependent on the underlying regulation (Pescetto, 2008). When a new regulation is introduced, its objectives can be clear from the regulator's perspective, but it might not be as clear for firms as they may perceive in different manners the risk arising from changes in regulatory policies. To capture this behaviour, we follow Ramiah, Martin and Moosa (2013) by incorporating interaction variables in the CAPM to estimate the overall change in systematic risk. The model is specified as follow:

$$\tilde{r}_{It} - \tilde{r}_{ft} = \beta_{It}^{0} + \beta_{It}^{1}[\tilde{r}_{mt} - \tilde{r}_{ft}] + \beta_{It}^{2}[\tilde{r}_{mt} - \tilde{r}_{ft}]AD_t + \beta_{It}^{3}AD_t + \tilde{\varepsilon}_{It} \tag{3}$$

where $\tilde{r}_{It}$ is the return of industry I at time t, $\tilde{r}_{ft}$ is the risk-free rate at time t which is proxied by the Vietnam government 10-year bond rate, and $\tilde{r}_{mt}$ is the return of the MSCI Vietnam, β_{It}^{0} represents the intercept of the regression equation, β_{It}^{1} is the systematic risk of industry I, and β_{It}^{2} captures the overall change in systematic risk following the announcements. AD_t is a time series dummy variable

that takes the value of one on the announcement date and zero otherwise, which sums up to 4, given that we are evaluating 4 announcements.

We perform a series of econometric tests: the Chow test to check the presence of structural breaks following each announcement and the Wald test to check for redundant variables. In addition, we test for autocorrelation and ARCH effects by using various modified ARCH models such GARCH (1,1), the threshold ARCH (TARCH), the exponential GARCH (EGARCH) and the power-ARCH (PARCH). We use the GARCH (1,1) model to capture the volatility clustering that arises within the daily time series whereby relatively higher volatility are observed on Mondays and Fridays rather than other days of a week. Other models such as TARCH is used to control for another characteristic of financial markets where higher volatility occurs during downturns than equivalent upturns or EGARCH is used to test for news in the form of leverage effects. We also use PARCH model that generalises the transformation of the error term in the models. The results of these models are used as a robustness check.

Eq. (3) is not flawless, however, as the outcomes of regulatory announcements might offset each other. Thus, we use an alternative equation as proposed by Ramiah et al. (2013) who replace *AD* by a series of individual dummy variables (*ID*) for each regulatory announcement to capture short-term changes in systematic risk. *ID* takes a value of one on the announcement date and zero otherwise. The equation is specified as

$$\tilde{r}_{It} - \tilde{r}_{ft} = \beta_{It}^{0} + \beta_{It}^{1}[\tilde{r}_{mt} - \tilde{r}_{ft}] + \Sigma_{a=1}^{4}\beta_{I,a}^{2}[\tilde{r}_{mt} - \tilde{r}_{ft}]^{*} ID_{at} + \tilde{\varepsilon}_{It} \quad (4)$$

We also estimate the long-term change in systematic risk by allowing *ID* to take a value of zero prior to the announcement date and one otherwise. The purpose of this exercise is to check whether the change in systematic risk following each regulatory announcement is temporary or permanent.

4. Data

The empirical results are based on daily data, obtained from Datastream, covering the period between 2006 and 2015. We used Datastream to download data on adjusted stock prices for each firm of 35 sectors in the Vietnam stock market. MSCI Vietnam is used as a proxy for the market and the Vietnam government 10-year bond rate is the proxy for the risk-free rate. We collected the announcements of the regulation on information disclosure from the Ministry of Justice website.

The announcements are listed in Table 1. On 18 April 2007, the Ministry of Finance issued the first information disclosure regulation, which was Circular 38/2007/TT-BTC Guidance for Information Disclosure on the Stock Exchange. The circular specifically addresses the issue of external reporting of listed firms, which marks the beginning of specific rules and regulations of disclosure issued by the Vietnamese authorities to improve the level of information transparency of Vietnamese listed firms. According to this circular, all listed firms are required to provide comprehensive annual reports that should include the following: (i) background and strategic information of the firm; (ii) a chairperson's report; (iii) a management report; (iv) human resources and employee information; (v) the ownership structure and information on the board of directors; and (vi) a set of financial statements. Financial statements are required, including a balance sheet, an income statement, a statement of cash flows and notes to financial statements. This circular has been revised frequently since its promulgation in 2007 to enhance the level of information disclosure. Specifically, it was revised and updated three times through the issuance of Circular 09/2010/TT–BTC on 15 January 2010, Circular 52/2012/TT–BTC on 5 April 2012, and Circular 155/2015/TT–BTC on 6 October 2015. Notably, Circular 155/2015/TT–BTC introduced more rigorous disclosure requirements to improve transparency and adapt to new market developments and international integration. One of the prominent changes is the inclusion of provisions that encourage listed firms to disclose information in both Vietnamese and English to facilitate foreign investors' access to information. This new circular is expected to promote information disclosure in English and gradually raise domestic disclosure practices to meet international standards. Additionally, there is a general obligation for a public firm to confirm or deny an event that has an impact on the firm's stock price.

5. Findings

Table 2 lists the sectors that experienced statistically significant reactions following the announcements of information disclosure regulation. We find that statistically significant reactions only appeared on 18 April 2007 when the Ministry of Finance issued Circular 38/2007/TT-BTC about guidance on the information disclosure of listed firms. We posit that the market tends to react only to the first announcement in a series of announcements of regulation and that any other subsequent amendments of the same regulation would not produce any impact on the market. Our results show that all sectors reacted positively to this event. Beverages

Table 1
Information Disclosure Regulation on the Vietnamese Stock Exchange from 2005 to 2017.

Regulation	Date of Issue	Description
Circular 38/2007/TT-BTC	18/04/2007	The regulation on information disclosure is announced.
Circular 09/2010/TT-BTC	15/01/2010	The first revision of the previous regulation with more information is required to be disclosed.
Circular 52/2012/TT-BTC	05/04/2012	The second revision to the previous regulation with more information is required to be disclosed.
Circular 155/2015/TT-BTC	06/10/2015	The third revision of the previous regulation with more information is required to be disclosed. The most prominent change is that the information is now required to be disclosed in both Vietnamese and English.

Table 2
Sectoral Reactions to the Announcements of Information Disclosure Regulation (in %).

Sector	18/04/2007		15/01/2010		5/04/2012		6/10/2015	
	AR	t-stat	AR	t-stat	AR	t-stat	AR	t-stat
Banks	3.72	2.65	−0.40	−0.29	0.76	0.54	0.57	0.40
Beverages	8.54	3.76	0.52	0.23	0.89	0.39	−0.27	−0.12
Chemicals	5.47	5.15	1.12	1.06	0.29	0.28	0.53	0.50
Construction and Materials	3.19	2.58	−0.41	−0.33	0.41	0.33	−0.18	−0.15
Electricity	2.92	2.43	−0.79	−0.66	−0.59	−0.49	1.04	1.30
Electronic and Electrical Equipment	3.74	2.47	−1.73	−1.14	−0.52	−0.34	1.10	0.73
Food Producers	4.99	5.05	−0.23	−0.23	0.37	0.37	0.90	0.92
Forestry and Papers	5.19	2.96	−1.78	−1.02	1.24	0.71	−0.73	−0.41
General Industrials	4.73	3.62	−1.78	−1.36	0.14	0.10	0.91	0.70
General Retailers	3.95	2.61	−0.87	−0.58	−1.16	−0.76	−0.49	−0.33
Household Goods and Home Construction	6.07	4.64	−0.75	−0.57	0.39	0.30	−0.15	−0.11
Industrial Metals and Mining	4.53	3.05	0.38	0.25	−0.32	−0.22	−0.74	−0.50
Industrial Transportation	4.66	3.79	−0.20	−0.16	0.32	0.26	1.95	1.59
Media	8.88	4.51	0.81	0.41	1.08	0.55	2.51	1.27
Nonlife Insurance	3.07	1.79	−1.51	−0.88	0.09	0.05	3.20	1.86
Personal Goods	2.97	2.03	−2.12	−1.45	1.54	1.05	0.37	0.25
Support Services	6.38	4.51	−0.19	−0.13	−0.12	−0.08	0.03	0.02
Technology Hardware and Equipment	4.49	2.66	1.36	0.81	0.70	0.41	0.82	0.49
Tobacco	5.23	2.29	−2.06	−0.90	4.01	1.76	0.33	0.15
Travel and Leisure	4.36	3.30	0.97	0.73	−0.55	−0.42	−0.60	−0.45

and media sectors, for instance, experienced the highest abnormal returns of 8.54% (with a t-statistic of 3.76) and 8.88% (with a t-statistic of 4.51) respectively. These unexpected positive abnormal returns pose a question on market anticipation whereby the stock price was already adjusted before this Circular came into force.

5.1. Market anticipation

When we analyse the sectoral reactions two and five days before the announcement of Circular 38/2007/TT-BTC on 18 April 2007, we find evidence of market anticipation showing that 17 sectors experienced negative CAR(-5), a negative CAR(-2) or both (Table 3). Additionally, Table 3 shows an upward trend of cumulative abnormal returns five and two days, respectively, before the announcement of Circular 38/2007/TT-BTC, implying that the effects of the regulation wear off over time. The chemicals sector, for instance, exhibited a negative CAR(-5) of -20.11% (with a t-statistic of -7.58) and a negative CAR(-2) of -6.33% (with a t-statistic of -4.00). After we removed firms with firm-specific news, the chemicals sector still exhibited a CAR(-5) of -20.11% (with a t-statistic of -7.58) and a CAR(-2) of -6.33% (with a t-statistic of -4.00) (see Table 4). Our findings indicate that the Vietnamese stock market anticipates these regulatory changes and that they are reflected in stock prices before the announcement date. An interesting

Table 3
Cumulative Sectoral Reactions to Information Disclosure Regulation on 18 April 2007 (in %).

Sector	CAR(-5)	t-stat	CAR(-2)	t-stat	AR	t-stat	CAR2	t-stat	CAR5	t-stat
Banks	−12.55	−3.57	−7.48	−3.53	3.72	2.65	−1.39	−0.66	1.17	0.33
Beverages	−13.30	−3.22	−10.56	−3.63	8.54	3.76	7.53	2.60	8.76	2.13
Chemicals	−20.11	−7.58	−6.33	−4.00	5.47	5.15	0.34	0.22	0.25	0.10
Construction and Materials	−8.05	−2.25	−4.75	−2.38	3.19	2.58	5.96	3.00	10.30	2.89
Electricity	−5.19	−4.33	−2.91	−2.42	2.92	2.43	3.08	2.56	10.77	8.97
Electronic and Electrical Equipment	−2.19	−0.53	−0.91	−0.37	3.74	2.47	−4.20	−1.78	−13.84	−3.49
Food Producers	−11.41	−4.20	−4.25	−2.71	4.99	5.05	3.44	2.21	9.63	3.55
Forestry and Papers	−5.33	−1.48	7.08	1.49	5.19	2.96	0.48	0.22	3.74	1.04
General Industrials	−10.30	−2.87	−6.32	−3.09	4.73	3.62	4.91	2.40	10.58	2.95
General Retailers	−11.85	−2.84	−6.84	−2.92	3.95	2.61	6.47	2.78	8.34	2.01
Household Goods and Home Construction	−3.31	−1.01	−4.14	−2.13	6.07	4.64	0.49	0.25	5.78	1.76
Industrial Metals and Mining	−10.65	−2.50	−1.80	−0.76	4.53	3.05	6.65	2.83	9.90	2.36
Industrial Transportation	−15.88	−4.54	−6.83	−3.48	4.66	3.79	4.22	2.15	8.82	2.53
Media	−6.88	−1.33	−9.52	−3.18	8.88	4.51	6.36	2.13	17.77	3.46
Nonlife Insurance	−15.72	−3.84	−10.03	−4.04	3.07	1.79	−1.71	−0.69	2.09	0.51
Personal Goods	−2.20	−0.54	0.17	0.07	2.97	2.03	6.64	2.91	13.89	3.40
Support Services	−15.99	−4.11	−8.37	−3.81	6.38	4.51	8.03	3.66	12.47	3.21
Technology Hardware and Equipment	−10.17	−2.35	−6.56	−2.61	4.49	2.66	8.39	3.34	18.76	4.33
Tobacco	−9.26	−2.05	−6.07	−1.97	5.23	2.29	8.36	2.72	16.68	3.72
Travel and Leisure	−6.98	−1.83	−6.34	−3.04	4.36	3.30	4.41	2.11	17.68	4.64

Table 4
Robustness Test for Reactions on 18 April 2007 (in %).

	Firm-Specific Removal									
Sector	CAR(-5)	t-stat	CAR(-2)	t-stat	AR	t-stat	CAR2	t-stat	CAR5	t-stat
Banks	−11.97	−3.36	−6.53	−3.06	2.97	2.09	0.30	0.14	−0.54	−0.15
Beverages	−4.20	−1.02	−6.89	−2.37	8.06	3.57	1.03	0.36	7.45	1.81
Chemicals	−20.11	−7.58	−6.33	−4.00	5.47	5.15	0.34	0.22	0.25	0.10
Construction and Materials	−6.34	−1.82	−3.82	−1.91	4.94	3.91	8.82	4.43	13.27	3.83
Electricity	−5.19	−4.33	−2.91	−2.42	2.92	2.43	3.08	2.56	10.77	8.97
Electronic and Electrical Equipment	−9.04	−2.15	−4.20	−1.68	4.01	2.58	−8.18	−3.39	−18.66	−4.58
Food Producers	−10.94	−4.04	−3.43	−2.19	4.59	4.66	3.25	2.09	9.09	3.36
Forestry and Papers	−8.39	−2.31	10.86	2.14	5.17	2.86	3.16	1.40	6.66	1.83
General Industrials	−12.35	−3.41	−5.99	−2.90	3.06	2.30	5.00	2.42	7.25	2.00
General Retailers	−11.85	−2.84	−6.84	−2.92	3.95	2.61	6.47	2.78	8.34	2.01
Household Goods and Home Construction	−3.31	−1.01	−4.14	−2.13	6.07	4.64	0.49	0.25	5.78	1.76
Industrial Metals and Mining	−10.63	−2.44	−0.10	−0.04	3.88	2.58	4.62	1.93	6.06	1.41
Industrial Transportation	−15.88	−4.54	−6.83	−3.48	4.66	3.79	4.22	2.15	8.82	2.53
Media	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nonlife Insurance	−18.16	−3.90	−15.04	−5.38	8.71	4.48	−3.65	−1.31	6.32	1.36
Personal Goods	−10.47	−2.45	−0.92	−0.39	3.92	2.56	12.43	5.21	23.93	5.60
Support Services	−18.94	−4.94	−9.61	−4.39	5.03	3.53	4.98	2.29	8.90	2.33
Technology Hardware and Equipment	−4.86	−1.06	−3.91	−1.48	4.96	2.82	8.73	3.31	19.47	4.24
Tobacco	−14.04	−3.19	−8.19	−2.72	3.71	1.67	5.78	1.93	11.42	2.61
Travel and Leisure	−6.98	−1.83	−6.34	−3.04	4.36	3.30	4.41	2.11	17.68	4.64

Other robustness tests are available upon request.

observation is the market reaction is in unison if we only consider one type of regulation (i.e. information disclosure regulation in this case) and this finding is contradictory to the findings of earlier studies (Pham et al., 2017 and 2018) where they find mixed reactions following regulatory announcements. This contradiction occurs due to the combination of all different types of financial or banking regulations in earlier studies makes it difficult to examine the effects of regulatory announcements and our results show that the true effect can be revealed by examining a series of announcements of a specific regulation. In addition, our findings fill the gap in the literature where it has failed to provide solid empirical evidence on market anticipation in the Vietnam stock market.

Furthermore, Table 3 provides evidence of continuous reactions as the sectors continue to react to Circular 38/2007/TT-BTC over the next two and five days after the announcement day. Our findings show that 15 out of 20 sectors experience either positive CAR(2) or CAR(5) or both whereas electronic and electrical equipment is the only sector that exhibited both negative CAR(2) and CAR(5). The construction and materials sector experienced a positive CAR(2) of 5.96% (with a t-statistic of 3.00) and a positive CAR(5) of 10.30% (with a t-statistic of 2.89). On the other hand, the electronic and electrical equipment sector showed a CAR(2) of -4.20% (with a t-statistic of -1.78) and a CAR(5) of -13.84% (with a t-statistic of -3.49) and at least one of our robustness tests support these findings (see Table 4). A plausible explanation for this phenomenon is due to market anticipation. In other words, the market anticipates the announcement of regulation and tends to over-react to that announcement before it is released. The market then readjusts to reduce the effect of overreactions after the announcement is made. Another observation from these results is that the reactions vary sector-by-sector. Since there are discrepancies among the listed firms in the Vietnam stock market, those firms who have been well prepared for the information disclosure regulation (i.e. that is they have been disclosing most or all required information before the regulation comes into effect) tend to experience positive abnormal returns while the ill-prepared firms are inclined to exhibit negative abnormal returns.

5.2. Concentrated reaction

Table 5 displays the direction of firm reactions within a sector following the announcement of Circular 38/2007/TT-BTC on 18 April 2007. Our findings suggest that firms tend to react in the same direction following a regulatory announcement and that the reaction is relatively concentrated on certain firms. The food producers sector, which is comprised of 11 firms, experienced negative CAR(-2) and CAR(-5). We find that 8 and 3 out of 11 firms experienced statistically significant negative CAR(-2) and CAR(-5), respectively. In addition, food producers sector exhibited positive AR, CAR(2) and CAR(5) and we observe that 7, 3 and 4 out of 11 firms within the sector had statistically significant positive AR, CAR(2) and CAR(5) respectively. Similar results are found in most sectors with the exception of construction and materials, industrial engineering, industrial transportation and support services sectors.

5.3. Difference between HOSE and HNX

We conduct a test to detect differences in the market reaction of the listed firms on the two stock exchanges and the results show a significant difference between the reactions of the firms listed on HOSE and HNX two days before the announcement of Circular 38/2007/TT-BTC on 18 April 2007. Table 6 shows a t-statistic of -2.35 which corresponds to a two-tailed p-value of 0.02. The differences in the reactions between the two stock exchanges are due to the following reasons. First, according to Decree No. 58/2012/ND-CP, the requirements for listing a firm on HOSE are generally more stringent than those required for listing on HNX. To be listed, the

Table 5
Firm Reactions within Each Sector on 18 April 2007.

Sector	Total Number of Firms	Number of Firms				
		CAR(-5)	CAR(-2)	AR	CAR2	**CAR5**
Banks	2	2 (-)	2 (-)	2 (+)		
Beverages	2	1 (-)	2 (-)	2 (+)	1 (+)	
Chemicals	1	1 (-)	1 (-)	1 (+)		
Construction and Materials	28	13 (-)	8 (-)	12 (+), 2 (-)	13 (+), 1 (-)	15 (+)
Electricity	2	1 (-)		1 (+)		1 (+)
Electronic and Electrical Equipment	3	1 (-)			1 (-)	1 (-)
Equity Investment Instrument	1					1 (-)
Financial Services	1					1 (-)
Food Producers	11	8 (-)	3 (-)	7 (+)	3 (+)	4 (+)
Forestry and Papers	3	1 (-)		3 (+)		1 (+)
General Industrials	6	2 (-)	3 (-)	2 (+)	2 (+)	2 (+)
General Retailers	2	1 (-)	1 (-)	1 (+)		1 (+)
Household Goods and Home Construction	1			1 (+)		
Industrial Engineering	6	2 (-)	1 (-)	1 (-), 1 (+)	3 (+)	2 (+)
Industrial Metals and Mining	3	2 (-)	1 (-), 1 (+)	3 (+)	2 (+)	2 (+)
Industrial Transportation	5	4 (-)	3 (-)	3 (+)	1 (-)	2 (+), 1 (-)
Leisure Goods	1					
Media	2		2 (-)	2 (+)	1 (+)	1 (+)
Nonlife Insurance	2	2 (-)	1 (-)	1 (+)		
Oil and Gas Producers	3	2 (-)	2 (-)	2 (+)		1 (+)
Personal Goods	2	1 (-)		1 (+)	1 (+)	1 (+)
Pharmaceuticals and Biotechnology	1					
Support Services	7	4 (-)	4 (-)	4 (+)	3 (+)	3 (+) 1 (-)
Technology Hardware and Equipment	2	1 (-)	1 (-)		2 (+)	2 (+)
Tobacco	2	1 (-)	1 (-)	1 (+)	2 (+)	2 (+)
Travel and Leisure	1	1 (-)	1 (-)	1 (+)	1 (+)	1 (+)
Total	100	51 (-)	37 (-), 1 (+)	51 (+), 3 (-)	34 (+), 3 (-)	41 (+), 5 (-)

Table 6
Difference in Market Reaction between HOSE and HNX.

Group	Observation	Mean	SD	t-statistic	diff	sig.
HNX	54	−0.06	0.06	−2.35	−0.025	0.02
HOSE	46	−0.04	0.04			

HOSE requires firms to be financially stronger, in terms of capitalisation, profitability and minimal debts when compared to HNX. Second, there is a five-year gap between HOSE and HNX, which means that HOSE's regulatory and enforcement mechanisms are more organised than those of HNX. As HOSE is the first and leading stock exchange in Vietnam, the listed firms on HOSE can be more influenced by international exposure than the firms listed on HNX leading to the pressure putting on the listed firms on HOSE to disclose more comprehensive information.

5.4. Risk analysis

To capture changes in systematic risk, we examine the effects of the four regulatory announcements on the systematic risk of 35 sectors. In general, our results indicate that most sectors exhibited an increase in systematic risk (Fig. 1)[2] . By using the aggregate risk model (3) in conjunction with a GARCH (1,1) specification, the tobacco and non-life insurance sectors were most affected by the regulatory announcements on information disclosure. The tobacco sector, for instance, experienced an increase of 1.95 in systematic risk to 2.45 (originally 0.5). The results are supported by other models such as TARCH, EGARCH and PARCH[3] . In addition, we find nine sectors that experienced a decline in systematic risk.

The effects of announcements as captured by Eq. (3) may offset each other, and for this reason, we use Eq. (4) to overcome this weakness by creating individual dummies for each announcement to capture the short-term and long-term effect on systematic risk. The results are reported in Figs. 2 and 3. Interestingly, we find that the financial sector was most affected in the short run by the publication of Circular 38/2007/TT-BTC on 18 April 2007 as the first regulation on information disclosure. The sector originally had a beta of 0.78, which declined by -4.64 to -3.86 following the event date. Another sector that experienced a large swing in short-term systematic risk is the media sector. Its short-term systematic risk increased temporarily by 2.56–2.98 following the publication of

[2] GARCH(1,1) results are reported in Fig. 1.
[3] The TARCH, EGARCH and PARCH models are available from the corresponding author upon request.

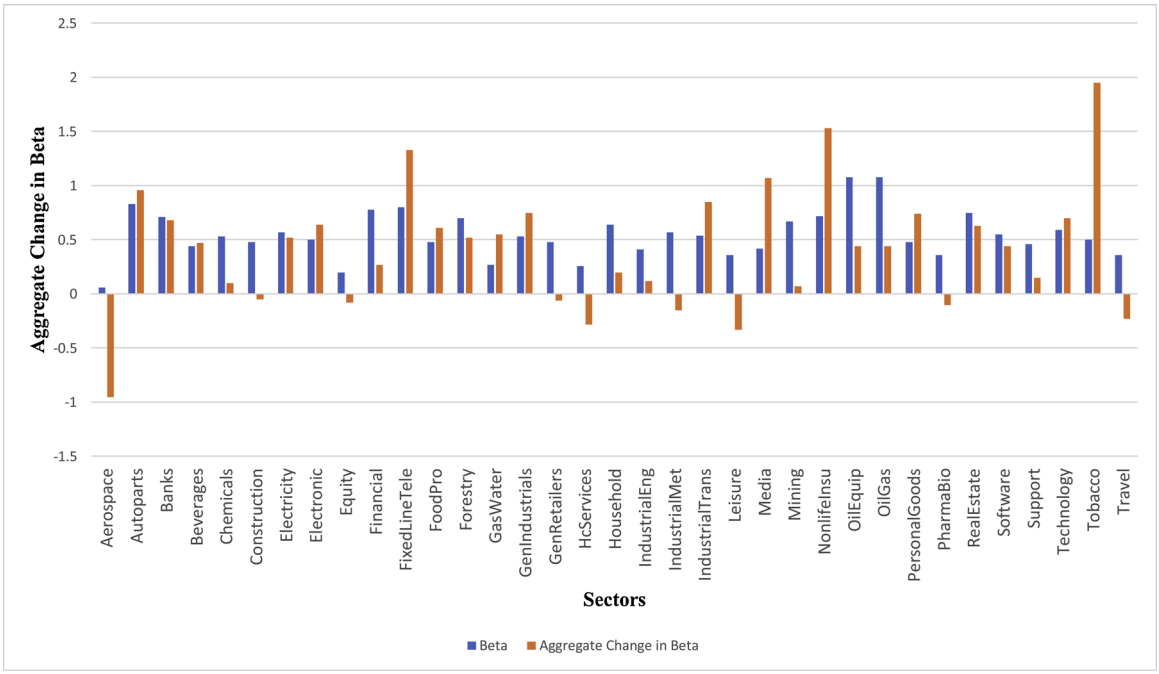

Fig. 1. Aggregate Changes in Systematic Risk following the Announcements on Information Disclosure Regulation.

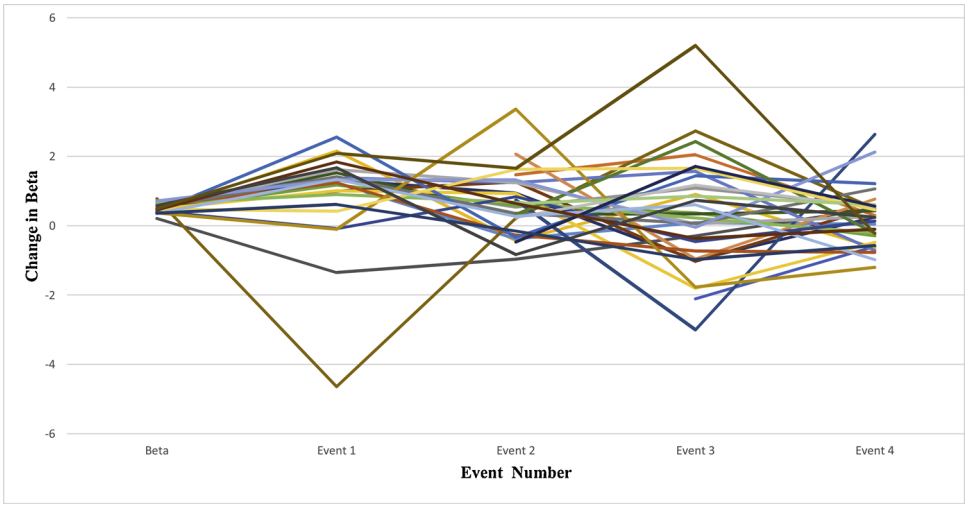

Fig. 2. Short-term Changes in Systematic Risk following the Announcements on Information Disclosure Regulation.

Circular 38/2007/TT-BTC. However, we find that changes in systematic risk did not hold in the long run as changes in long-term systematic risk following this event moved in an opposite direction in comparison to short-term changes (Fig. 3). Our findings, in general, suggest that regulatory announcements on information disclosure tend to cause a temporary shock, rather than a long-term shock, to the market.

6. Conclusion

The regulation of information disclosure is intended to ensure that listed Vietnamese firms on the Vietnamese stock exchange disclose all available information to investors to improve information efficiency and transparency, but the effects of these changes are unclear. Our findings confirm the existence of market reaction to regulatory announcements and reveal that, in contrast to earlier studies of Pham et al. (2017) and Pham et al. (2018) where the authors find mixed results, the reaction is relatively unified across sectors following announcements on information disclosure regulation. In general, we observe that sectors tend to react negatively two and five days before the event date and positively on the event date, two and five days after the event date. We conclude that the

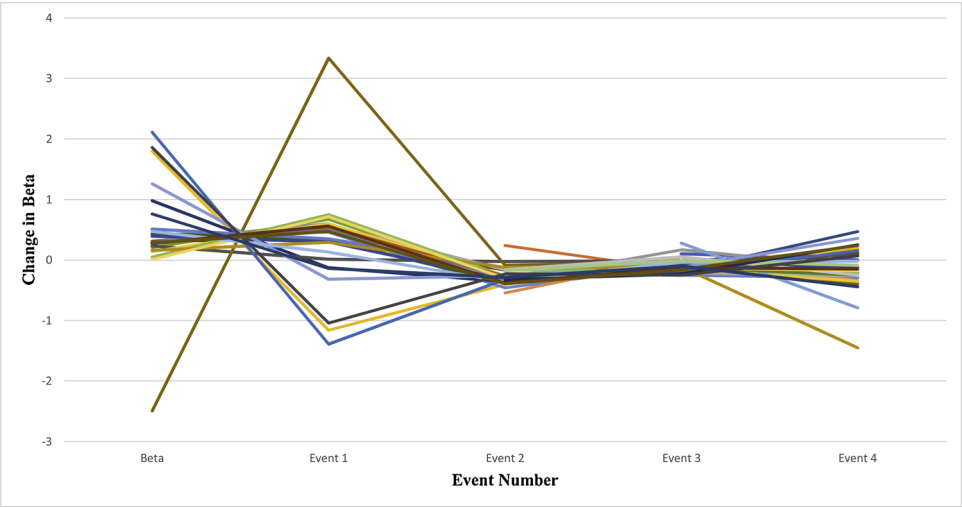

Fig. 3. Long-term Changes in Systematic Risk following Announcements on Information Disclosure Regulation.

Vietnamese stock market can anticipate changes in regulation and incorporate these changes into stock prices. This is one of the main contributions of this study where we provide empirical evidence on market anticipation and fill the existing gap in the literature on the Vietnamese stock market. However, we find that the stock market reaction is relatively concentrated in certain firms. In addition, our results show a difference between the reactions of the Ho Chi Minh Stock Exchange and the Hanoi Stock Exchange such that the Hanoi Stock Exchange tends to yield more negative returns. Finally, we find evidence of risk shifting behaviour, but the effects only exist in the short run.

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