Journal of Asian Economics 79 (2022) 101451

Contents lists available at ScienceDirect

Journal of Asian Economics

journal homepage: www.elsevier.com/locate/asieco

The impact of opportunity factors on fraudulent behavior in the Vietnamese stock market

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ARTICLE INFO

Keywords:
Fraudulent behavior
Price manipulation
Insider trading
Opportunity factors
Vietnam stock market

ABSTRACT

This study examines the opportunity factors on fraudulent behavior in Vietnam's stock market by employing mixed methodology. In this regard, data were obtained from 20 in-depth interviews and 568 questionnaire survey responses of securities companies, fund management companies, stock exchanges and the State Securities Commission in Vietnam. Using the exploratory factor analysis, the study discovered that the following groups of opportunity factors result in fraudulent behavior: (i) influences of the internal person and issuer, which include (person whose internal information has not been published by the company), collusion of the issuer and securities company, abuse of power by influential person in the company, complex organizational structure of the issuer (one person handling multiple positions) and failure of an issuer to properly control internal information; (ii) investors' factors, which include investors' trade of securities based on the insider's suggestion, framework of foreign investors, brokerage company recommendations, and advisory information on securities forums; and (iii) factors associated with market management and supervision, such as use of lenient penalty with no deterrent effect, untimely market management and limited authority of the securities committee. Using regression analysis, the order of the impact of each group of factors was found as follows: factors due to internal person and the issuing organization, the market management and supervision, and investors.

1. Introduction

The first recorded case of market manipulation was the Tulip Bulb scandal in 1636 in the Netherlands. Ever since, the number of frauds had increased, especially during economic crises in the 17th and 18th centuries (Johnstone, 1998). As long as opportunities for profitability exist, frauds will likely persist (Rezaee et al., 2004). Stock market fraud results in negative consequences for investors,

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https://doi.org/10.1016/j.asieco.2022.101451
Received 26 February 2021; Received in revised form 28 November 2021; Accepted 16 January 2022
Available online 21 January 2022
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such as unfair transactions, financial loss and reduced confidence (Peterson & Buckhoff, 2004; Rezaee et al., 2004). Fraud affects issuers via reduction of growth dynamics in businesses, rise in capital costs and drop in stock price accuracy due to limited competition in the information market (Lord, 2010; Murphy & Tibbs, 2010; Rezaee & Riley, 2010). In addition, fraud also reduces investment efficiency, limits the development of the capital market and the whole economy, reduces the liquidity of the market and generates several costs and losses to society (Carlton & Fischel, 1983; Peterson & Buckhoff, 2004; Rezaee et al., 2004). For the stock market to achieve its fairness, transparency and efficiency goals, state management agencies need to strengthen their administrative role to prevent and limit fraud. According to the argument of the fraud triangle theory, fraud only occurs when the following three factors exist: pressure, opportunity, and justification. The major opportunity factors represent the gaps or lapses through which fraudulent behaviors can be executed. The prevention and limitation of opportunity factors will facilitate the blockage and reduction of fraudulent behaviors. Since the factors of pressure and rationalization influence the morality and conscience of individual, they are often expressed inwardly and difficult to assess accurately and objectively (Jennifer, 2013; Kolman, 2007).

Vietnam stock market officially came into operation in year 2000 with only two public firms – Refrigerated Electrical Engineering Corporation (REE Corp) and Saigon Cable and Telecom Material Company (Samco) with stock codes REE and SAM respectively, and with market capitalization of US$65 million. By 2020, the whole market had 737 listed stocks, with 73 securities companies, and the market capitalization reached US$228 billion. After more than 20 years of development, Vietnam's stock market has increasingly improved in terms of a more established organization, enhanced liquidity and diversified products. However, fraudulent acts in the stock market also have been increasing in numbers and severity. During the period 2010–2020, the State Securities Commission (SSC) issued an average of 240 sanctioning decisions annually, which amounted total fine of 15.7 billion VND per year (more than US$680 million) (see Appendix 1). In addition to the violations that have been detected and resolved, there are several breaches that were left unsanctioned due to insufficient evidence. Many serious cases leading to the loss of billions of VND for investors over a long period of time show the existence of ineffectiveness in the management and supervision of the authorities. These include forgery of documents, as in the case of MTM stock documents which cost 1064 individual investors a total amount of 56 billion VND (more than US$2.4 million); and CDO stock price manipulation, resulting in sudden drop in stock prices for 26 consecutive sessions within a month, costing nearly 82% of the value (Bach, 2018). The State Securities Commission of Vietnam once transferred three investigations to the police, all of which were rejected due to lack of evidence, despite the clear indication of insider trading, especially for the purpose of market manipulation (Ta, 2019).

Empirical wise, better scrutiny is needed given the disparities in existing literature. Evidence amassed shows an increasing attention on the field of financial fraud research (Du & Wei, 2004; Kenyon & Tilton, 2012; Phan & Zhou, 2014). Past studies identified several dimensions of financial fraud; investor related (Dorminey, Fleming, Kranacher, & Riley, 2010; Nguyen, 2012; Phan & Zhou, 2014) as well as market management and supervision related (Bhattacharya & Daouk, 2009; Rosen, 2007; Wei, Chen, & Wirth, 2020). However, studies on opportunity factors leading to fraudulent activities appear to be limited. A comprehensive measure is needed to evaluate the complex nature of opportunity factors leading to fraudulent activities. Indeed, Vietnam's stock market is a frontier market among emerging markets, but studies analyzing frauds components are still limited and unidimensional. Currently literature on Vietnamese fraudulent activities mostly focuses on fraud disclosure related to financial statements (Ha, 2016; Le, 2013; Ta, 2017).

Given the above gaps, there is a need for further investigation on the fraudulent activities in the Vietnamese stock market, by assessing different dimensions of opportunity factors. This investigation is pertinent, to offer lasting resolution to the concerned management bodies. Therefore, this study focuses on fraudulent behaviors such as price manipulation, insider trading and misinformation disclosure. Specifically, the study tries to uncover opportunity factors paving ways for fraudulent activities in a bid to offer solutions to eradicate deceptive behavior in the Vietnamese stock market and other similar markets.

2. Literature Review

2.1. Methods of Fraudulent Activities in the Stock Market

This section describes various types of fraud that can be committed in the stock market. Continuous purchase and sale of securities is a popular technique to create false supply and demand in the market. The increment of the trading account is the most favorable method utilized to raise false liquidity in the market. Also known as the "pump and dump" plan, a technique which executes price manipulation as highlighted by several authors (Aggarwal & Samwick, 2003; Back & Baruch, 2004; Kyle, 1984). Next, continuous trading using a manipulated volume. A typical example of this orchestration is where a group of investors sell a large number of shares belonging to a company with a good business plan, which causes the stock price to decline and trick the market into believing that investment in the company would be bad (Back & Baruch, 2004). Conversely, manipulators can buy a substantial amount of stock from another company which creates a false belief of great opportunities for investment in that company. This leads other investors to misjudge the company's prospects and stock price and thus result in their inappropriate investment decisions (Back & Baruch, 2004; Chakraborty & Bilge, 2004).

Another common method of fraudulent activity is the promotion of investment trends to influence the stock price. The major strategy of those participating in this type of market conspiracy is to "manipulate" other investors' belief. An investor may conspire with an insider to "deceive" other investors by manifesting contradictory behaviors with insights as part of the strategy (Back & Baruch, 2004; Chakraborty & Bilge, 2004; Van Bommel, 2003). Another method is disclosure of misinformation or ignition of misunderstandings regarding the company's prospects in order to increase the stock price significantly and sell them at a higher price. However, there are also cases where disclosure of wrong information resulting in the defamation of a company and causing its stock price to decrease. This type of fraud is mostly employed in goods' collection before review or in business merger and acquisition

(Aggarwal & Samwick, 2003; Kyle, 1984).

Another type is the usage of inside information in securities transactions. Since people within the enterprise are informed of the company's future cash flow before any external parties, some studies show that insider trading can take place before a company event, such as the announcement of acquisition, merge and share repurchase, dividend payout and stock buyback (Bonaime & Ryngaert, 2013; Carlton & Fischel, 1983).

2.2. Opportunity Factors Leading to Fraud in the Stock Market

Cressey's fraud triangle theory (Cressey, 1953) has been widely applied worldwide in the field of financial fraud research for more than 70 years. The theory mainly argues that fraud only occurs when there are three factors, namely pressure, opportunity and justification; in the absence of one of the three factors, fraud cannot be performed. Numerous studies have focused on the opportunity factors, which are the lapses or gaps that lead to fraudulent behaviors in the stock market. Some of them are reviewed below.

2.2.1. Opportunity Factors due to Insiders and Issuing Organizations

Those with undisclosed inside information have the opportunity to conduct illegal transactions to make significant profits compared to the market, as they have access to sufficient information about the company's prospects, especially before events that would have significant impacts on the stock price (Meulbroek, 1992). Collusion between insiders and brokerage firms has been identified as a common form of fraud in the studies of Aggarwal and Samwick (2003), Dorminey, Fleming, Kranacher, & Riley, 2010, Free and Murphy (2015) and Klein and Maxson (2010). Issuing organizations and underwriters take advantage of their privileged positions to limit supply, while colluding with brokers to create false demands from investors.

Furthermore, top management of the firm such as members of management board and board of directors, may have the opportunity to perform or entice their employees into committing fraud. Many investors consider insider trading as a signal of the company's business activities and cash flow (Mackevičius & Bartaška, 2003). Due to this knowledge, insiders can share the opposite information to confuse the investors. In some cases, the publisher can take advantage of their position to disclose insights in a subjective manner. Numerous studies have demonstrated that managers and employees committing fraud usually work in the company for a long period of time, and they have a thorough understanding of the weaknesses in the internal control, making it easy for them to commit the crimes without fear (Cressey, 1953; Ewa & Udoayang, 2012).

Many studies have reported that the presence of involved parties' transactions (parent companies or- subsidiaries) ranks second among the most frequent opportunities for fraud, while several other studies claimed otherwise (i.e., third rank). The fact is that firms' unusual transactions with group models, multinational enterprises, parent companies and subsidiaries facilitate the manipulation of financial statements in a subjective manner to enable transfer of costs or losses. The manipulation of financial statements is often a part of the plan to create false and misleading information about corporate financial situation for readers, thereby contributing to the successful implementation of the internal transaction and manipulation (Ming & Wong, 2003; Moyes, Lin, & Landry, 2005).

Next, a complicated organizational structure, in which one person handles multiple positions. The complex organizational structure complicates the process of internal control, especially when members in the management board undertake various positions, serving as an avenue to disclose information and establish financial statements in a subjective manner. Similarly, when management board members are also members of board of directors, leading to operational independence, that can limit internal control as well as the inability to detect and promptly handle fraud (Farber, 2005; Loebbecke, Eining, & Willingham, 1989; Lou & Wang, 2009; Miller, 2006; Skousen & Twedt, 2009; Wells & Gill, 2007).

Fraud activities are also driven by issuing organizations' lack of effective control over inside information. Companies are also required to have effective anti-fraud programs to block fraudulent activities committed by people with access to inside information (Jeng, 1998; Loebbecke et al., 1989; Noe, 1999). The most common restriction is to allow insiders to transact for only a particular period (usually 20–30 days) after the income announcement (Jeng, 1998; Noe, 1999). Many enterprises hold press conferences with analysts to discuss and expand the information regarding their earning announcements in order to prevent misappropriation of insights for the interest of individuals and groups (Noe, 1999). In countries with developed stock markets, corporations have implemented specific policies and procedures, as well as set clear dates and time to effectively control insiders' transactions (Jeng, 1998; Xu Sun, 2015).

2.2.2. Opportunity Factors due to Investors

Investors tend to make group-oriented decision and are distracted by those manipulating the market. They also feebly analyze information released by the issuing organizations. As the ratio of noise traders and uninformed traders increases, the difference between the real and bubble value will rise and enrich market manipulators (Easley & O'Hara, 1987). Investors' tendency to trade according to insiders' pattern creates a domino effect, which provides an opportunity for price and volume fluctuations (Cornell & Sirri, 1992). As a result, innocent investors accidentally abetted some groups of manipulators. Demsetz (1968) and Bagehot (1971) argued that there are three types of investors: traders that have exclusive information (traders with undisclosed information); investors that trade based on insiders' guidance (noise traders who are misled to believe that they have effective information), and ignorant traders. The authors claimed that traders who rely on insiders or investors having insights tend to increase the abnormal trading volume, which serves as an opportunity for manipulators to raise stock price as they wish. Stoll (1989) and George, Kaul, and Nimalendran (1991) suggested that people with inside information are more able to conceal their insider transactions when there are many manipulators and traders based on insiders' information in the market.

Investors also tend to trade based on foreign investors' pattern and recommendations by brokerage firms. In Vietnam, transactions

of foreign investors are of significant interest to domestic investors who believe that foreign traders are usually professional investors, and their transactions can shape the market. Therefore, securities companies often take advantage of this tendency to push information manipulating certain groups of investors, by affecting their mentality (Le, 2017; Nguyen, 2012). Studies of Aggarwal and Samwick (2003) and Dorminey, Fleming, Kranacher, & Riley, 2010 suggested that brokers abet manipulators by offering investment recommendations for their subjective purposes.

In Vietnam, stock forums are considered a place for investors to exchange information and evaluate the market. However, these websites have both accurate and inaccurate information. They serve as a tool for price manipulation teams to offer information, opinions and comments about securities or issuing organizations. If investors trade solely based on the advice on these forums without proper refinement and analysis, it may render them vulnerable to stock price manipulation in line with the manipulators' subjective opinions (Le, 2017; Nguyen, Tran, & Zeckhauser, 2017).

2.2.3. *Opportunity Factors due to Market Management and Supervision*

Several researches on management emphasized the lack of supervision, ineffective monitoring measures and criteria as some of the risk factors that increase the chances of fraud (Bussmann & Werle, 2006; Dorminey, Fleming, Kranacher, & Riley, 2010). A combination of studies by Ewa and Udoayang (2012) and (Kenyon & Tilton, 2012) showed that surveillance systems must be available to detect fraudulent acts timely and accurately. Use of a monitoring system whose criteria are outdated or lacks the ability to forecast new forms of fraud can facilitate occurrence of fraud and evasion of punishments. Inadequate legal system to prove and sanction fraudulent activities also contributes to the opportunity factors. This is further aggravated by lack of up-to-date laws, which match the market trends and the shortage of effective anti-fraud policies (Aggarwal & Samwick, 2003; Bhattacharya & Daouk, 2009). Policies for denunciators play an important role in detecting and limiting fraud. A denunciator is an individual who identifies and reports a fraud or the possibility of fraud (Rosen, 2007).

The sanctions and punishments for fraud are light and not deterrent enough. Bhattacharya and Daouk (2009) and Choi (2007) argued that fraud is more likely to happen in countries with ineffective enforcement of securities laws. The observation on stock market in underdeveloped countries shows that the sanctions do not commensurate with the degree of crimes. Lawbreakers have various ways to avoid penalties or are able to choose a lesser offence. People committing fraud may trade illegally at the time of profit optimization and accept to pay a fine afterwards. In some cases, insiders even use disclosure requirements to ambush the market by declaring an intention to buy securities to hide their actual sale plan and vice versa (Du & Wei, 2004).

However, the sanctions and punishments are not timely. Studies in Vietnam revealed that all cases related to manipulated transactions and insider trading are detected and resolved only after the crime has been commited. This means that individuals and groups who have achieved their goals are punished by the monitoring system for committing violations. The number of cases detected by the Exchanges is quite high but only a few are resolved (the number of SSC inspectors issuing sanctioning decisions accounts for only about 10% of total cases in that year). Supervisors have not been able to find the exact figure of accounts that influence the market's transactions as well as identify the causes of unusual fluctuations in stock price in a bid to come up with appropriate resolutions for these cases (Le, 2017; Nguyen, 2016).

2.3. *Research Gap*

Evidence ammased shows that over time, there is an increasing attention on the field of financial fraud research (Choi, 2007; Du & Wei, 2004; Kenyon & Tilton, 2012). With regards to opportunity factors which influence fraudelent behavior, two dimensions have been identified; investor related as well as market management and supervision.

Nevertheless, studies on opportunity factors leading to fraudulent activities appear to be limited and therefore warrants further investigations. Despite several empirical studies on the stock market ecosystem in Vietnam (Bui & Amaria, 2014; Chi et al., 2021; Pham, Hai, Lai, Lam, & Hoang, 2019;), little is known about the opportunity factors leading to fraudulent activities. For instance, Phan and Zhou (2014) examine factors influencing individuals' intention to invest in the Vietnamese stock market. The results indicate strong evidence of psychological and behavioral factors in individuals' attitude towards investment. However, the above-mentioned study does not assess market management and supervision dimensions. Additionally, several studies indicate that there is a lack of monitoring system for committing violations in relation to the Vietnamese stock market (Le, 2017; Nguyen, 2016).

Empirically, there are several studies on stock market fraud (Back & Baruch, 2004; Bagehot, 1971; Bonaime & Ryngaert, 2013; Chakraborty & Bilge, 2004; Easley & O'Hara, 1987), however these studies mainly focus on developed markets which already have ample data. While Vietnam's stock market is a frontier market among emerging markets, data sources for analyzing frauds are still limited. Current research on securities market fraud in Vietnam mainly focuses on disclosure fraud related to financial statements (Ha, 2016; Le, 2013; Ta, 2017; Tran, 2014), and these studies apply the fraudulent triangle theory of Cressey (1953). However, with regards to price manipulation and insider trading fraud, there are currently no in-depth studies showing the opportunistic factors leading to fraudulent behavior in the stock market. Most studies analyze a few violation situations, summarize experience from around the world, focus on analyzing the weaknesses of the monitoring criteria and then offer solutions and recommendations (Bui, 2015; Nguyen, 2005; Ta, 2019; Vo, 2008).

In this vein, this study examines the opportunity factors leading to fraudulent activities in the Vietnamese stock market. Specifically, it focuses on fraudulent behaviors such as price manipulation, insider trading and misinformation disclosure. The study uncovers opportunity factors that are paving ways for fraudulent activities in a bid to offer solutions to eradicate deceptive behavior in the Vietnamese stock market and other similar markets.

3. Methodology and Research Model

3.1. Research Methods

This study employed a mixed methodology combining both qualitative and quantitative research methods.

The qualitative methods: case studies are employed using in-depth interviews with the goal of identifying methods of fraud execution (the dependent variable) and opportunity factors (the independent variable) leading to fraud in the Vietnamese stock market. In-depth interviews were also conducted with 20 experts from securities companies, the State Securities Commission of Vietnam, stock exchanges and fund management companies (see Table 1). Researching fraudulent behavior is one of the most sensitive issues. Therefore, direct intensive interviews allow free access to market participants and facilitate their honest response to the research issues. Interviewing multiple subjects with cross questions aided the acquisition of a more complete, corroborated, and comprehensive views. The respondents are representative of the survey sample, they were from different provinces, cities and regions.

The management of Vietnam's stock market is institutionally organized and supervised. The Ministry of Finance is responsible for managing the securities market, the State Securities Commission is a supplementary unit that implements the management and supervision of the securities market according to the decentralization and authorization of the Ministry of Finance. Stock Exchange of Vietnam, and securities companies are under the management and supervision of the State Securities Commission.

Currently, Vietnam has 2 stock exchanges, namely Ho Chi Minh Stock Exchange and Hanoi Stock Exchange, with 73 securities companies being members of both Stock Exchanges. Among 73 securities companies, the top 10 securities companies account for more than 60% of the brokerage market share, the remaining 63 securities companies share 40% of the brokerage market (market share statistics of the Ho Chi Minh Stock Exchange in 2020).[1]

Therefore, to ensure representativeness, the authors tried to contact and conduct in-depth interviews with representatives in all three regions of the country - the North, Central and South. However, they were mostly done in Hanoi and Ho Chi Minh City. Twenty people were interviewed, including experts with more than 5 years of experience from securities companies, the State Securities Commission, the Stock Exchange, and investors, university lecturers specializing in the stock market and participate in securities investment. The officers at the inspection department of the State Securities Commission and the supervisory department of the State Securities Commission are the ones who directly perform the work of detecting and handling fraudulent acts. As Hanoi Stock Exchange has the second levels of supervision, the number of people interviewed in these units is more (2–3 people).

Vietnam's stock market is considered quite fledgling since it has just been formed and developed over the last 20 years. It is currently classified as a frontier market and is in the process of upgrading to an emerging market. Therefore, in the process of operation and management, especially in preventing and limiting fraudulent acts, there are still many shortcomings. A long-term study that analyzes data in a prolonged period would reveal that frauds are increasingly complex and sophisticated, with many opportunistic factors occurring over a long period of time or frequently. Thus, the proposal to amend and supplement legal documents must be prognostic and thoroughly address the opportunistic factors leading to fraudulent behavior.

Table 2 shows 14 cases of typical fraud in Vietnam's stock market from 2010 to 2019. The data was collected from the summary of reports of fraud cases on the Vietnamese stock market for the period 2010–2020 provided by the State Securities Commission. In this vein, typical and representative cases will be selected for research and analysis.

The authors used the exploratory factor analysis (EFA) to explore the opportunities aiding fraudulent behaviors in Vietnam's stock market. Subsequently, the regression model was used to determine the order of influence of opportunity factors that lead to fraud in the stock market. For this, the study utilized a data set of 568 survey questionnaire responses gathered from experts at securities companies, SSC, stock exchanges and fund management companies.

The survey form is designed based on reference to the research on investor behavior in the stock market by Nguyen (2012) and financial statement fraud on the Vietnamese stock market by Ta (2017). These studies also apply the fraudulent triangle theory of Cressey (1953). The survey (Google) forms were sent to subjects in person, via phone, securities companies, and emails. The questionnaire consists of two parts (Details can be found in Appendix 1). Part 1: General information about survey respondents including gender, education level, profession, number of years of experience in securities investment. Part 2 encompasses questions about the relevance of opportunity factors to the incidents of fraud in the Vietnamese stock market and the degree of relevance of fraud practices on a 5-level Likert scale (1 - Strongly agree; 2 - Agree; 3 - Normal; 4 - Disagree; 5 - Strongly disagree). Based on the survey results, the questions and answers were coded according to the variable symbol and the level ranges from 1 to 5 corresponding to 5 levels in the Likert scale.

The respondents are investors and stockbrokers with more than five years of experience, as well as experts at the State Securities Commission, stock exchanges and fund management companies.The questionnaire comprises of seven groups of opportunity factors emanating from insiders and issuing organizations (the independent variable), six groups due to investors (the independent variable), another six groups due to governing bodies (the independent variable) and five means of committing fraud (the dependent variable). The total number of valid and usable questionnaires was 568.

Of the 568 survey samples, there are 332 survey samples of men (58.45%), and women accounting for 41.55%, which means men are of the majority. Survey involved well-educated subjects, as 93.48% surveyed have a university or graduate degree. Only 6.5% of total respondents have a college or high school degree.

[1] For more information, please refer to the Ho Chi Minh stock exchange at https://www.hsx.vn/.

Table 1
List of in-depth interviewees.

No	Interviewees	Number of people	Province/City/Region
1	Manager of SSI Securities Corporation	1	Ho Chi Minh (Southern)
2	Manager of Mirae Asset Securities Company	1	Ha Noi (Northern)
3	Manager of Vietcombank Securities Company	1	Ho Chi Minh (Southern)
4	Manager of VietFund Management Company	1	Ha Noi (Northern)
5	Manager of Bao Viet Fund Management Company	1	Ha Noi (Northern)
6	Inspection Office of the State Securities Commission	3	Ha Noi (Northern)
7	Supervision Department of the State Securities Commission	2	Ha Noi (Northern)
8	Hanoi Stock Exchange	2	Ha Noi (Northern)
9	Investors at SSI Securities Corporation	1	Ho Chi Minh (Southern)
10	Investors at Vndirect Securities Company	1	Da Nang (Middle)
11	Investors at Vietcombank Securities Company	1	Da Nang (Middle)
12	Investors at Mirae Asset Securities Company	1	Ho Chi Minh (Southern)
13	Investors at Military Commercial Securities Company	1	Da Nang (Middle)
14	Lecturer of Stock Market Subject at National Economics University	1	Ha Noi (Northern)
15	Lecturer of Stock Market Subject at Vietnam University of Commerce	1	Ha Noi (Northern)
16	Lecturer of Stock Market Subject at Hanoi Industry University	1	Ha Noi (Northern)
Total		**20**	

Source: Authors

Of the 568 analyzed survey questionnaires, there are 291 surveys of investors with more than 5 years of experience in securities investment (accounting for 51.23%), the number of surveys of people working in the securities sector (securities companies, State Securities Commission, Stock Exchange) account for 48.77%. This shows that the research sample is relatively even among the surveyed subjects.

The survey results were processed by the SPSS program through the following steps: First, the research assessed the scale's credibility with Cronbach alpha coefficient of 0.7 or higher and the total correlation coefficient of 0.3 or above. Second, the authors verified the scale value by analyzing the EFA whose factor loading was above 0.5. The principal component used in the research was Varimax rotation. Third, the study tested the scale's credibility using Cronbach alpha coefficient after eliminating inappropriate indicators. Fourth, the researchers analyzed the correlation between variables. Fifth, the authors analyzed the multi-linear regression model.

3.2. Research Model

Table 3 provides the summary of dependent and independent variables. The authors developed a regression equation to evaluate the impact of opportunity variables on various types of fraud in Vietnam's stock market. Regression analysis is used to estimate the equation that best fits the observed result sets of the dependent and independent variables. It allows to obtain the best estimate of the true relationship between the variables.

$$\mathbf{FRD} = \beta\mathbf{0} + \beta\mathbf{1}\mathbf{*ISD} + \beta\mathbf{2}\mathbf{*IVT} + \beta\mathbf{3}\mathbf{*MNG}$$

Where:

FRD: type of fraud.
ISD: opportunity variable due to insiders and issuing organizations.
IVT: opportunity variable due to investors.
MNG: opportunity variable due to market management and supervision.

4. Findings and Discussion

4.1. Research Findings

4.1.1. Evaluation of the Scale's Credibility

Cronbach's alpha coefficient is adopted to evaluate the intrinsic consistency of the reliability of the scale (Cronbach, 1951). Intrinsic consistency describes the extent to which all indicators measure the same construct, i.e., the interrelations of the indicators. Expressed between the values of 0–1, this test allows the elimination of inconsistent variables that can create dummy factors. Cronbach's alpha values greater than 0.8 are considered good scale and values ranging from 0.7 to 0.8 are also deemed acceptable. However, Cronbach's values of 0.6 and above can be used in cases where the research concept is new (Nunnally, 1978; Peterson, 1994). Therefore, the value of Cronbach's alpha considered in this research is > 0.7.

The process of evaluating the reliability of the scale was conducted twice. Tables 4 and 5 illustrate the analysis of Cronbach's alpha to prove the scale's credibility. The value of the Cronbach's alpha coefficients for all variables exceeds 0.7. However, the ISD4 indicator with Cronbach's alpha coefficient if the item is deleted is 0.809, which is greater than the initial credibility evaluation of scale shown in Table 6, where the Cronbach's alpha coefficient of the ISD variable is 0.802. Meanwhile, the MNG1 indicator of Cronbach's alpha

Table 2
Case Studies.

No	Ticker symbol involving with fraud	Year	Type of fraud	Typicality
1	KSH - Damac GLS Joint Stock Company	2010	Insider trading	This case indicates that insider trading is actually very difficult to detect. Since the relationships in society are very complex, apart from the tippers, identifying tippees is very difficult.
2	SKG- Superdong Fast Ferry Kieng Giang Join stock company	2017	Insider trading	When the company has information (good or bad) that increases or decreases the stock price but is not disclosed in time, there is a possibility that insider transactions have occurred.
3	SHN - Ha Noi Investment General Corporation	2012	Insider trading	Before the announcement of important information, several insiders have sold off their stocks to avoid losses; however, there is insufficient proof to sanction them, leading to incorrect assessment of criminals and disregard of the crime.
4	SBC - Saigon Beer Transportation Joint Stock Company	2015	Insider trading	Outside investors often refer to insider trading as
5	D2D - Industrial Urban Development Joint Stock Company No. 2	2018	Insider trading	a signal of the company's situation and prospects. Transactions of insiders without reporting lead to untimely and incorrect assessments of outside investors.
6	DVD - Vien Dong Pharmaceutical Joint Stock Company	2011	Price manipulation	This is also a serious violation, owing to its complexity disclosure of false information to manipulate stock prices and mislead investors.
7	TNT - Tai Nguyen Corporation	2018	Price manipulation	The situation shows that manipulation is quite common. Right after the discovery of one investor manipulation, another one happens. The detection and handling of the violation by the authorities is slow, sometimes up to a few years after the incident.
8	CDO - Consultancy Design and Urban Development Joint Stock Company	2016	Price manipulation	This is the second time that the charge of manipulating securities prices has been prosecuted in Vietnam. The subject took advantage of the position of director of a securities company to use 70 customer IDs at 24 securities companies to forge contracts to open accounts, use margin services, and guarantee payment for accounts to collect money to buy and sell, resell between accounts, creating a false liquidity, pushing CDO's stock price right from the time the new shares are listed.
9	SPI – SPI Joint Stock Company	2017	Price manipulation	With a total fine of nearly 10 billion VSD (more than US$400,000), this was the largest amount of personal fines at that time. However, there were not enough grounds for the criminal prosecution. Former senior leader of the company used the classic tactic of using multiple accounts to create fake supply and demand to manipulate stock prices.
10	MTM - Central Mining and Mineral Import - Export Joint Stock Company	2019	Price manipulation	This was a complicated case that did not only violate price manipulation but also combined collusion, appropriation of properties, falsification of documents and disclosure of false information. The case showed that problems with several authorities that licensed MTM to issue shares to the public, indicating the lack of effective coordination among management agencies.
11	KDM - Le Gia Investment Group Joint Stock Company	2018	Price manipulation	Authorities did not realize that there were illegal benefits from violations, due to the complicated nature of the "collusion" factor. Stocks were intentionally beaten up and down in waves, alternating with correction sessions and avoiding continuous ceiling-hitting or floor-dropping which could create doubts for management agencies.
12	AAA - An Phat Bioplastics Joint Stock Company	2011	Price manipulation	The price manipulation has caused systemic risk where a series of securities companies

(*continued on next page*)

Table 2 (*continued*)

No	Ticker symbol involving with fraud	Year	Type of fraud	Typicality
				simultaneously disbursed AAA shares due to the use of excessive margin tools in the accounts.
13	DVD - Vien Dong Pharmaceutical Joint Stock Company	2011	Misinformation disclosure	The former chairman of the board of directors cum general director of the company instructed a number of employees and acquaintances to set up companies to do roundabout business, forge large value contracts, falsify bank loan documents and manipulate financial statements to disclose false information.
14	FLC - FLC Group Joint Stock Company	2017	Misinformation disclosure	The trader did exactly opposite with what he announced to the shareholders. At the unexpected shareholder meeting, the chairman of the board of directors of FLC announced to investors that he would buy up to 50 million shares of the company. This information immediately created a positive effect that pushed up stock prices. But in fact, soon after he sold 57 million FLC shares, earning about 400 billion VND (nearly US$17.6 million) but did not report to the Securities Commission. In particular, he was only fined for the error of "Not reporting the expected transaction" with the amount of 65 million VND (nearly US$2860).

Source: Authors

coefficient if the item is deleted is 0.858, which is higher than the Cronbach's alpha coefficient of the MNG variable being 0.832. Therefore, to increase the suitability of the scale, for the second round of analysis, the research removed the two indicators, namely ISD4 and MNG1.

4.1.2. Exploratory factor analysis (EFA) of the Independent Variables

EFA is a form of multivariate statistical tool to identify an unobservable variable which can parsimoniously describe the covariation among the set of observed variables (Brown, 2015). EFA is a fundamental tool in the validation evaluation of measurement instruments and is executed on the correlation matrix between the variables. EFA is used in studies to explain many measurements with a small number of potential attributes (Wu et al., 2019). This method can generate a model to find the main attributes and evaluate its overall performance. EFA is also able to amass large criterias into a limited set of qualities based on the correlation between criterias. In EFA, an unobserved variable is called a factor and the associations between unobserved and observed variables are called factor loadings (Fontaine, 2005).

Factor loadings are standardized regression weights. Besides factor loading, Kaiser-Meyer-Olkin (KMO) is also a criterion used to evaluate the appropriateness of EFA (Kaiser, 1974). The appropriate discovery factor is analysed when $0.5 \leq \text{KMO} \leq 1$ (Hair, 1998).

Based on the aforementioned information, the authors assess the value of the scale by considering the discovery factor EFA with the following criteria: factor loading > 0.5, KMO coefficient > 0.5 and extraction variance $> 50\%$. The factor extraction method used is the rotation method of Varimax factors.

After testing the suitability of the scale, the authors implemented EFA. The analysis was performed twice, with the factor loading in each analysis being above 0.5. This proved the existence of appropriate correlation between the observed variables (indicators) and the factors selected in the model. However, indicators such as ISD5, IVT1, IVT2, MNG2 and MNG3 were eliminated at the first analysis due to their failure to achieve the "convergent validity" for the same factor. Results of the second analysis showed that the remaining data were eligible for analysis, as their factor loading was above 0.5 and they satisfied the conditions of "convergent validity" (observed variables converged to the same factor) and "discriminant validity" (observed variables that belong to one factor are different from other variables). Tablke 7 shows the results of first and second analysis of EFA. Table 7.

4.1.3. Exploratory Factor Analysis (EFA) of Dependent Variables

The Bartlett test considers the hypothesis that the variables are not correlated in the overall; however, if this test is statistically significant (Sig. ≤ 0.05), the observed variables are correlated with each other in the overall. The EFA of dependent variables illustrated that the KMO coefficient was 0.756 (> 0.5), signifant value was 0.000 (<0.05), average variance extracted was 50.503%, and indicators were combined into a single variable, indicating that the requirements of "convergent validity" were fulfilled. Thus, the scales of the dependent variable are suitable and meet the analysis requirements (see Table 8 and Table 9).

4.1.4. Assessment of the New Scale's Credibility

After performing the EFA, eliminating inappropriate indicators and grouping them into new variables, authors evaluated the credibility of the scale. Cronbach's alpha testing of the new variables proved the credibility of the scale used in the analysis, as the Cronbach's alpha coefficients of all variables exceed 0.7 (see Table 10).

Table 3
Summary of Dependent and Independent Variables.

Variable Code	Indicators	Sources
I	*Fraud opportunities due to insiders and issuing organizations (independent variables)*	
ISD1	People with undisclosed inside information	Bonaime and Ryngaert (2013),Nguyen et al. (2017)
ISD2	Collusion of issuing organizations, insiders, and securities companies	Aggarwal and Samwick (2003),Dorminey, Fleming, Kranacher, & Riley, 2010
ISD3	Abuse of power and status	Ewa and Udoayang (2012),Mackevičius and Bartaška (2003)
ISD4	Asking friends or acquaintances who do not contribute capital or not run the firm to be the company's legal representatives	Amended from case studies and in-depth interviews.
ISD5	Issuing organizations have transactions with related parties and parent companies – or subsidiaries	Moyes et al. (2005),Ming and Wong (2003)
ISD6	Issuing organizations have a complicated organizational structure, i.e., one person handles multiple positions	Farber (2005),Lou and Wang (2009)
ISD7	Issuing organizations do not effectively control inside information	Loebbecke et al. (1989),Jeng (1998),Noe (1999)
II	*Fraud opportunities arising due to investors' lack of knowledge and investment decisions based on herd mentality (independent variables)*	
IVT1	Investors do not thoroughly analyze the information of issuing organizations	Easley and O'Hara (1987),Nguyen et al. (2017)
IVT2	Investors lend securities accounts to friends and acquaintances	Amended from case studies and in-depth interviews.
IVT3	Investors buy or sell securities based on insiders' suggestion or those who are believed to have inside information	Cornell and Sirri (1992),Demsetz (1968),Bagehot (1971)
IVT4	Investors tend to trade in accordance with the foreign investors' pattern	Nguyen (2012)
IVT5	Investors trade based on brokers' recommendation	Aggarwal and Samwick (2003),Dorminey, Fleming, Kranacher, & Riley, 2010
IVT6	Investors trade based on advice from securities forums	Nguyen et al. (2017)
III	*Fraud opportunities due to ineffective market management and supervision (independent variables)*	
MNG1	"Leverage-creating credit" services by securities companies	Amended from case studies and in-depth interviews.
MNG2	Inopportune detection of fraud by supervision system of government bodies	Ewa and Udoayang (2012),Dorminey, Fleming, Kranacher, & Riley, 2010
MNG3	Inadequate legal system fails to detect or incorrectly evaluates criminals and lacks policies for denunciators	Aggarwal and Samwick (2003),Bhattacharya and Daouk (2009)
MNG4	The sanctions are too light and not deterrent	Bhattacharya and Daouk (2009),Choi (2007),Nguyen et al. (2017)
MNG5	Inopportune and delayed sanctions and punishments	Nguyen (2016)
MNG6	Limited authority of the SSC to partake in investigation and sanctions	Amended from case studies and in-depth interviews.
IV	*Methods of committing fraud (dependent variables)*	
FRD1	Use of one or many accounts to continuously buy and sell in order to create false supply and demand for securities	Aggarwal and Samwick (2003),Kyle (1984)
FRD2	Continuous trade with the controlling volume at the time when the closing price or the new opening price of the security is determined	Back and Baruch (2004),Chakraborty and Bilge (2004)
FRD3	Expression of opinions through the mass media about a security in order to influence the stock price	Van Bommel (2003),Back and Baruch (2004), Chakraborty and Bilge (2004, 2004)
FRD4	Disclosure of false or misleading information to greatly affect the stock price in the market	Aggarwal and Samwick (2003),Kyle (1984)
FRD5	Use of inside information to trade	Carlton and Fischel (1983),Vo (2008)

Source: Authors

Table 4
Evaluate the reliability of the dependent variable scale.

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
FRD1	14.14	8.299	0.516	0.711
FRD2	14.30	8.897	0.485	0.722
FRD3	14.23	8.432	0.578	0.690
FRD4	14.27	8.540	0.498	0.718
FRD5	14.16	8.487	0.523	0.708

4.1.5. PEARSON Correlation Analysis Among Variables

The study carried out correlation analysis to determine the relationship between variables and the degree to which the variables are linearly related. It provides information about the importance of the relationship, or correlation, as well as the direction of the relationship (see Table 11).

Correlation analysis demonstrated that all variables have significant influence on fraud in the stock market and also have a close correlation with each other (Sig coefficients (2-tailed) are < 0.05). Therefore, for accuracy, it is necessary to review the role of independent variables in the multivariate regression model by reviewing the degree of impact of each independent variable on dependent variables.

Table 5
Evaluate the reliability of the scale of independent variables.

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ISD1	19.77	19.237	0.525	0.779
ISD2	19.89	19.584	0.580	0.769
ISD3	20.01	19.252	0.601	0.765
ISD4	20.47	20.754	0.363	0.809
ISD5	19.92	19.466	0.572	0.770
ISD6	20.07	18.949	0.632	0.759
ISD7	20.10	19.759	0.496	0.784
IVT1	16.50	13.330	0.413	0.746
IVT2	16.82	13.241	0.403	0.750
IVT3	16.43	12.908	0.515	0.719
IVT4	16.49	12.762	0.540	0.712
IVT5	16.53	12.595	0.570	0.705
IVT6	16.49	12.236	0.564	0.705
MNG1	17.46	19.049	0.333	0.858
MNG2	17.15	16.256	0.645	0.796
MNG3	17.03	16.041	0.715	0.782
MNG4	17.05	16.091	0.692	0.786
MNG5	17.09	16.395	0.715	0.783
MNG6	17.32	17.323	0.553	0.815

Table 6
Credibility Evaluation of the Scale via Cronbach's Alpha Coefficient.

No	Variables	Acronym	Cronbach alpha coefficient (1st round)	Cronbach alpha coefficient (2nd round)
1	Methods of committing fraud	FRD	0.754	0.754
2	Fraud opportunity variable due to insiders and issuing organizations	ISD	0.802	0.809
3	Fraud opportunity variable due to investors	IVT	0.758	0.758
4	Fraud opportunity variable due to market management and supervision	MNG	0.832	0.858

Source: Aggregated from analysis

Table 7
Results of EFA.

EFA	*KMO coefficient*	*P-value*	*Average Variance Extracted (%)*	*Factor Loading*	*Conclusion*
First analysis	0.877	0.000	61.116	All > 0.5	Elimination of 5 indicators
Second analysis	0.817	0.000	60.595	All > 0.5	Eligible for analysis

Source: Aggregated from analysis

Table 8
KMO Coefficient of Dependent Variables.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.756
Bartlett's Test of Sphericity	Approx. Chi-Square	616.244
	df	10
	Sig.	.000

Source: Aggregated from analysis

4.1.6. Analysis of Regression Model

Regression analysis as shown in Table 12 illustrated that all independent variables included in the model had a positive correlation with dependent variables, given the significance values of less 0.05 and the positive standardized beta coefficients.

The ISD has the highest influence with standardized coefficients beta of 0.413, followed by MNG (0.211) and IVT (0.079). The regression equation is illustrated as follows:

$$FRD = 1{\cdot}470 + 0.377*ISD + 0.072*IVT + 0.164*MNG$$

Table 9
Average Variance Extracted of Dependent Variables.

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.525	50.503	50.503	2.525	50.503	50.503
2	.844	16.883	67.386			
3	.671	13.413	80.799			
4	.514	10.273	91.072			
5	.446	8.928	100.000			

Note: Extraction Method - Principal Component Analysis.
Source: Aggregated from analysis

Table 10
Assessment of the Credibility of the New Scale.

No	Variables	Acronym	Cronbach's alpha coefficient
1	Fraud opportunity variable due to insiders and issuing organizations	ISD	0.781
2	Fraud opportunity variable due to investors	IVT	0.756
3	Fraud opportunity variable due to market management and supervision	MNG	0.806

Source: Aggregated from analysis

Table 11
Correlation Coefficient Among Variables in the Model.

Variables		FRD	ISD	IVT	MNG
FRD	Pearson Correlation	1	.543**	.289**	.443**
	Sig. (2-tailed)		.000	.000	.000
	N	568	568	568	568
ISD	Pearson Correlation	.543**	1	.324**	.493**
	Sig. (2-tailed)	.000		.000	.000
	N	568	568	568	568
IVT	Pearson Correlation	.289**	.324**	1	.361**
	Sig. (2-tailed)	.000	.000		.000
	N	568	568	568	568
MNG	Pearson Correlation	.443**	.493**	.361**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	568	568	568	568

* *Correlation is significant at the 0.01 level (2-tailed).
Source: Aggregated from analysis

Table 12
Regression Analysis of the Factors of Independent Variables.

No	Independent variables	B	Standardized Coefficients Beta	Sig.	Variance Inflation Factor VIF
	(Constant)	1.470		0.000	
1	ISD	0.377	0.413	0.000	1.366
2	IVT	0.072	0.079	0.035	1.188
3	MNG	0.164	0.211	0.000	1.406

Source: Aggregated from analysis

The R^2 adjusted value was 0.337, indicating that independent variables included in the model could explain 33.7% of the variation of dependent variable (FRD).

Analysis showed that there was no multicollinearity, as all Variance Inflation Factors (VIF) were below 2. This proved the accuracy of the testing model and collected data. Table 13 shows the value of statistical mean (descriptive statistics). The survey data consisted of 568 samples with response amplitudes coded from 1 to 5.

4.2. Discussion

In summary, fraud opportunity factors include fraud chances arising from insiders and issuing organizations; investors' lack of knowledge or herd mentality; and ineffective market management and supervision. All these had impacts on the occurrence of fraud in

Table 13
Value of Statistical Mean.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
ISD1	568	1	5	3.60	1.141
ISD2	568	1	5	3.48	1.009
ISD3	568	1	5	3.36	1.036
ISD6	568	1	5	3.30	1.045
ISD7	568	1	5	3.27	1.095
IVT3	568	1	5	3.42	1.007
IVT4	568	1	5	3.36	1.004
IVT5	568	1	5	3.32	1.001
IVT6	568	1	5	3.36	1.076
MNG4	568	1	5	3.57	1.110
MNG5	568	1	5	3.53	1.039
MNG6	568	1	5	3.30	1.084
Valid N (listwise)	568				

Vietnam's stock market. In particular, factors of the insider and issuing organization had the greatest influence on fraud in the Vietnamese stock market. The result of the statistical mean showed that, among the opportunity factors, people with undisclosed inside information were the most common cause of fraud in the stock market (Mean of ISD1 = 3.60) (see Table 13). This result agrees with findings from case studies and in-depth interviews as well as corresponds with the research of Carlton and Fischel (1983) and Bonaime and Ryngaert (2013). The factor was followed by collusion among major shareholders, issuers and securities companies (Mean of ISD2 = 3.48) (see Table 13). This outcome is similar to observations from the case studies and in-depth interviews as well as concurred with the findings of Aggarwal and Samwick (2003) and Free and Murphy (2015) who discovered that 58.7% of financial fraud were conducted with accomplices. In addition, collusion was also a key element in many complicated and costly frauds (Dorminey, Fleming, Kranacher, & Riley, 2010; Klein & Maxson, 2010). Major factors causing fraud in the Vietnam's stock market include: (i) abuse of power and status to entice others into committing fraud; (ii) complicated organizational structure of issuing organizations, in which a person handles multiple positions; and (iii) failure of issuing organizations to effectively control inside information. These results did not completely conform with studies of Mackevicius & Bartaska (2003), Lou and Wang (2009), Jeng (1998) and Noe (1999), which are solely focused on financial statements fraud without considering insider trading and stock price manipulation.

The factor group named "ineffective market management and supervision" ranked second in terms of influence on fraudulent activities in the stock market. In this regard, light sanctions, with no deterrent effect (Mean = 3.57), inopportune and late sanctions and punishments (Mean = 3.53) and limited authority of the SSC in investigation and sanctions (Mean = 3.30) are those factors in this group which had the most effect on fraud in Vietnam's stock market. The results corresponded with the findings from the in-depth interviews and case studies. Similar to the study of Le (2017), this research proved that all cases involving the manipulation of transactions and insider trading are detected and resolved only after thier occurrence. This means that only individuals and groups caught after achieving their goals are punished by the monitoring system. Nguyen et al. (2017) argued that securities fraud resulting from light sanctions could be responsible for the current situation. The following factors had absolutely no impact on fraud in the Vietnamese stock market: (i) leverage-creating credit services by securities companies; (ii) inopportune detection of fraud by supervision system of government bodies; (iii) inadequate legal system to prosecute criminals; (iv) and lack of policies supporting denunciators. The outcome is supported by the studies of Aggarwal and Samwick (2003), Bhattacharya and Daouk (2009), Dorminey, Fleming, Kranacher, & Riley, 2010, Ewa and Udoayang (2012) and (Kenyon & Tilton, 2012). Furthermore, Nguyen et al. (2017) explained that Vietnam's stock market is the place where securities laws exist but without effective enforcement. Factors like "leverage-creating credit' services by securities companies" was identified in the case studies but unsupported in the quantitative results. During the in-depth interviews, experts also said that the margin rate allowed by securities companies was acceptable, which is also acknowledged in the Securities Law; therefore, securities enterprises were not motivated to exceed the permitted rate like they did before.

The last group of factors affecting fraud is investors' lack of knowledge and herd mentality. This result was similar to outcomes from studies by Nguyen (2012). Factors such as "investors do not thoroughly analyze issuing organizations information" and "investors lend securities accounts to friends and acquaintances" did not have any influence on fraudulent behaviors in the Vietnamese stock market. This finding is in contrast with results from the studies of Easley and O'Hara (1987), and Nguyen et al. (2017).

To recapitulate, there are a number of opportunity factors that lead to fraud, indicating the need for the management to mend these lapses to prevent and limit fraudulent behaviors in the Vietnamese stock market.

Drawing from the research results, the authors propose following recommendations. Firstly, to make substantial improvement of legal documents related to securities trading activities. Legal documents on state management of securities and stock market need to be amended and improved on a regular basis. Securities companies have responsibilities and obligations towards fraudulent acts commited by investment accounts registered at their companies. It is also essential to establish supervisory responsibilities at the third level for securities companies in the monitoring system of trading.

Laws and regulations should clearly stipulate issuing organizations' responsibilities towards fraud prevention. It is pertinent to require issuing organizations to have regulations to monitor fraud and protect shareholders' rights. Issuing organizations should develop internal regulations on the management and processing of inside information to protect the legitimate interests of

shareholders in the company. In the process of internal control, it is essential to establish regulations to easily identify people who receive inside information. Concurrently, it is also important to develop laws to restrict insiders' transactions at the time of information disclosure. Specifically:

(i) Aside from public officers, executives in issuing organizations should be restricted from conducting transactions related to securities issued by their own companies from the date of publication of the annual balance sheet until the approval of the annual report. These regulations should also apply to the staffs of issuing organizations and those who are legally involved in drafting the balance sheet. Parties receiving the report for liquidating, authorized people, and those ultimately responsible for the report should not be allowed to trade or disclose information to others in a bid to control transactions related to securities of their own issuing organizations.
(ii) Essential insiders (insiders who are legally required to disclose information) and others related to them should be prohibited from conducting transactions with securities issued by their own company prior to the publication of the company's interim and financial statements. This period should last for at least 14 days or 21 days, if the company publishes information on the results of production and business activities every six months.
(iii) If a market situation indicates that someone is conducting transactions based on inside information, the issuing organizations may disclose such inside information officially, if it is deemed necessary. This will allow all investors to make investment decisions based on the same information and in this way, insider trading can be eliminated. Similarly, when market activities indicate that someone may be conducting transactions based on inside information, which in reality does not exist, the issuing organizations are required to issue a notice dismissing such activities. This will help prevent stock price manipulation.
(iv) If unchecked, the current fraudulent practices will emerge into new configurations when the Vietnamese stock market enters more developed phase by expanding into high-frequency and algorithmic trading, driven by advanced technology. In well developed markets, it was found that reputable websites were used to publish ghost-written and anonymous articles to disseminate misleading information, which are actually paid promotions, that could reach far more investors and drive-up stock prices. Predatory traders could also focus on algorithm trading through the practice of "spoofing" (submitting thousands of buy or sell orders and then cancelling them before execution) which can cheat algorithm traders who need to respond in a microsecond. The State Securities Commission should foresee such high-frequency and algorithmic trading fraudulent activities in the near future in Vietnam. It should consider setting in place regulations, and awareness and training programs to tackle such developments.

It is also necessary to separate the State Securities Commission from the Ministry of Finance and make them independent. The current operation of State Securities Commission under the Ministry of Finance limits their authority in investigating and sanctioning. The State Securities Commission should be given more power to exercise its supervisory role and promptly respond to violations as well as unrestricted access to account information, and information of those individuals or organizations showing signs of fraud. Fig. 1 shows the present legal position of the State Securities Commission and Fig. 2 shows our recommended legal position of the State Securities Commission. The State Securities Commission should cooperate with agencies and organizations, especially through securities companies, to intensify training and education to raise awareness and prevent fraudulent acts against investors. Specifically:

(i) They should develop and implement programs to improve financial knowledge of investors. The programs should include training on basic financial knowledge and more sophisticated investment products, and the ability to verify the suitability of investment products for personal needs. These measures can minimize trading by investors with herd mentality, such as trading

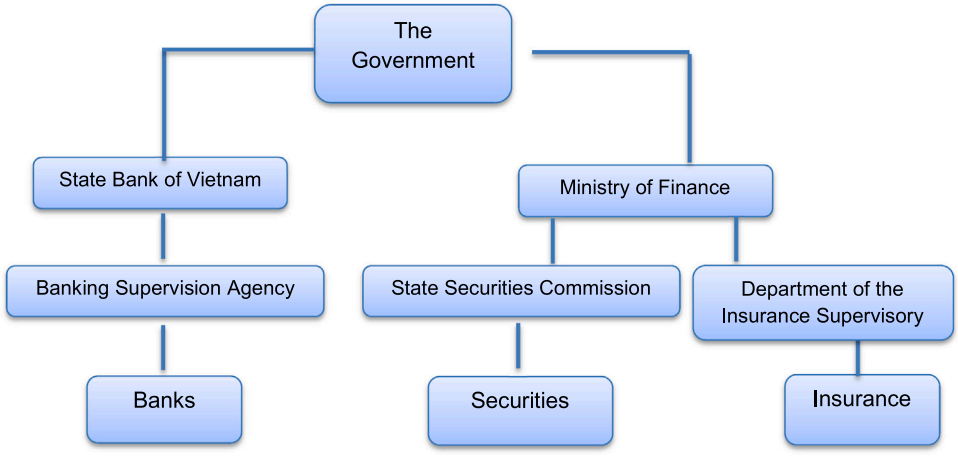

Fig. 1. Current Legal Position of the State Securities Commission.

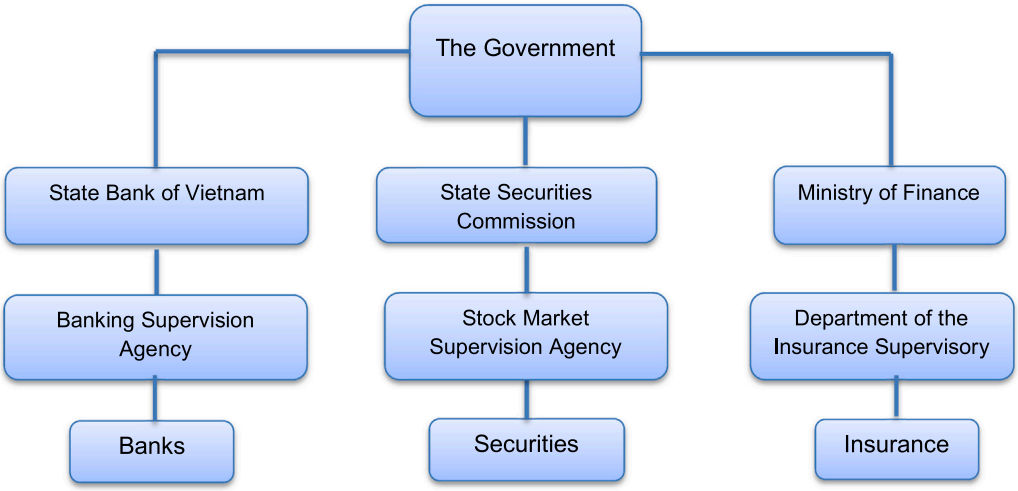

Fig. 2. Recommendations of Legal Position of the State Securities Commission.

in foreign investors' pattern, trading based on advice by brokers or securities forums, and trading that is believed to be based on insider information.

(ii) Establishment of programs to enhance knowledge on frauds' recognition and prevention. Investors should be trained on how to recognize, irregularities and signals of fraud, such as breaches in disclosure of inside information by insiders and issuing organizations, the nature of figures in the financial statements, auditors' note, abnormal price changes without information support, and enticing market reviews regarding manipulation of stock price.

(iii) Dissemination of knowledge about rights and obligations of investors. It is necessary that investors are aware of their basic rights when investing in securities of issuing organizations, and their obligations when participating in securities transactions. As an instance, investors have the right to notify fraudulent behaviors as well as denounce those committing fraud. And concurrently, investors must not lend securities accounts or be the company's legal representative without contributing capital or running the firm.

5. Conclusion and Recommendations

The order of influence for the groups of factors leading to fraud in Vietnam's stock market from the greatest to the lowest was identified as follows: opportunity factors due to insiders and issuing organizations, factors due to the ineffective market management and supervision, and factors due to investors' lack of knowledge or herd mentality. Specifically, "people with undisclosed inside information" and "collusion of issuing organizations, insiders and securities companies" are the most common ones in the factor group due to insiders and issuing organizations. This result corresponds with research outcomes of several local and foreign authors. In addition, some outcomes are unique, as the Vietnamese stock market is still developing and has just been in operation for 20 years, resulting in its inadequate legal system and management model. Particularly, "inopportune and delayed sanctions and punishments" and "limited authority of the SSC in investigation and sanctions" are the most critical factors in the factor group due to ineffective market management and supervision. The factor group with lowest impacts on fraud was "investors' lack of knowledge and herd mentality".

The abovementioned research results can be applied in the State Securities Commission, securities companies, enterprises, and investors to proactively preclude and limit fraudulent activities in the Vietnamese stock market. First, the research results will have practical implications for the State Securities Commission, especially in the recommendations of the law and legislative authority in investigating and sanctioning fraudulent acts. Secondly, the research results help investors to enhance their awareness, roles and understanding of fraud, and swindling prevention, so that the stock market can achieve efficiency, fairness, and transparency. Finally, the research results can be applied by issuers and securities companies to help them to identify vulnerabilities which are prone to fraud, thereby helping to strengthen the management measures and corporate governance to prevent and limit fraudulence.

Due to limited resources, the research faced some limitations. The authors only studied stock fraud in the general stock market and excluded fraud in derivatives market and fraud combined in derivatives market and general stock market. Also, the study also concentrated on insider trading, price manipulation, creation or disclosure of false information without including other acts, such as adjusting or falsifying securities documents and records, and using accounts and property of others without their consent or appropriating other people's property. However, despite these limitations, the study has made a major contribution towards understanding the complex issues surrounding the fradulent activities in the Vietnam stock market.

In general, research on financial market misconduct has been growing over the years due to increasing fraud and insider trading. This is particularly the case since the 2008 and 2009 global financial crisis. With respect to fraudulent activities in the Vietnam stock market, future studies could have multidisciplinary focus (legal, economic, sociological, organizational, and cultural conditions) for

better understanding of the underlying reasons for financial market misconduct and fraud. This will help to understand the causal factors from outside the traditional sphere of finance. For example, financial market fraud research in future could be expanded into psychological and behavioral analyses. Further, future research on fraud and financial market misconduct in Vietnam and in other countries could also make use of new computer methods such as “big data”.

Compliance with ethical standards

NA.

Declaration of Competing Interest

The authors state that there is no conflict of interest.

Data Availability

The authors do not have permission to share data.

Appendix 1. Statistics of fraudulent acts on the stock market 2007 – 2019

Frauds	Number of violations handled												
	2007	2008	2009	2018	2011	2012	2013	2014	2015	2016	2017	2018	2019
Violations of the issuers (1)	56	94	115	74	81	67	44	50	44	56	122	74	101
Insider trading, price manipulation (2)	3	3	5	9	14	2	7	2	4	6	7	9	8
Internal and large shareholders’ violations of reporting policies, (3)	17	16	26	260	57	62	34	33	60	51	199	260	325
Violations of Securities, and Fund Management Company (4)	6	11	12	19	14	41	23	33	29	14	21	19	16
Other Violations (5)	1	0	0	9	0	7	0	3	13	0	0	9	2
Total number of penaties (6)	83	124	158	371	166	179	108	121	150	133	349	371	452
Total value of penalties (billion VND)	–	3,8	4,1	15	11	11	8	10	12	12,3	30,4	20	28,1

Source: State Securities Commission of Vietnam

Appendix 2. Questionnaire structure and symbols of variables in the research model

Part 1: includes four questions regarding personal information of respondents
Part 2: consists of 19 questions according to a 5-level Likert scale to study the influence of opportunity factors leading to fraud in Vietnam stock market. 1. Absolutely no influence; 2. No influence; 3. Medium influence; 4. Really influence; 5. Absolutely influence.The first group of questions revolves opportunity factors due to insiders and issuing organizations (independent variables) which include:+ ISD1: People with undisclosed inside information+ ISD2: Colludition among issuing organizations, insiders and security companies+ ISD3: Abuse of power and status+ ISD4: When asked by friends or acquaintances, they can be the company’s legal representative but not contribute capital or run the firm+ ISD5: Issuing organizations have transactions by related parties, parent companies - subsidiaries+ ISD6: Issuing organizations have a complicated organizational structure, one person is in charge of multiple positions.+ ISD7: Issuing organizations do not effectively control inside informationThe second group of questions revolves opportunity factors due to investors (independent variables) which include+ IVT1: Investors do not thoroughly analyze issuing organizations’ information+ IVT2: Investors lend securities accounts to friends and acquaintances+ IVT3: Investors buy or sell securities according to insiders or those are believed to have inside information+ IVT4: Investors tend to trade in foreign investors’ pattern+ IVT5: Investors trade based on brokers’ recommendations+ IVT6: Investors trade based on advice on securities forumsThe second group of questions revolves opportunity factors due market management and supervision (independent variables) which include+ MNG1: "Leverage-creating credit" services by securities companies.+ MNG2: Inopportune detection of fraud by supervision system of government bodies+ MNG3: Inadequate legal system misses or incorrectly evaluates criminals, lacks policies for denunciators.+ MNG4: The sanctions are too light, and not deterrent+ MNG5: Inopportune and delayed sanctions and punishments+ MNG6: Limited authority of the SSC in investigation and sanctions***Part 3***: composes of 5 questions revolving ways to commit fraud (measurement of dependent variables):+ FRD1: Use one or many accounts to continuously buy and sell to create false supply and demand for securities.+ FRD2: Continuously trade with the controlling volume at the time for determining the closing price or the new opening price of that security.+ FRD3: Give opinions through the mass media about a security

(*continued on next page*)

(*continued*)

Part 1: includes four questions regarding personal information of respondents
to influence the stock price.+ FRD4: Disclose false or misleading information to greatly affect stock price on the market+ FRD5: Use inside information to trade.

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