The Impact of Information Disclosure on Firms' Systematic Risks – The Case of Vietnam Stock Market

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Abstract

Purpose – *The purpose of this study is to examine the association between information disclosure and the impact of systematic risk of the biggest listed non-financial companies in two stock exchanges of Vietnam.*

Design/methodology/approach – *The data was gathered from the annual reports of listed companies in VN30 and the HNX30 from the year of 2018 to 2022 to construct the disclosure index (DS). The study will use two approaches to estimate firms' beta. The first method is to estimate beta through historical price fluctuations in 35 firms (the historical market model). The second method is using the fundamental approach to estimate betas in 38 companies.*

Findings – *The result shows that there is an expected negative association between the level of information disclosure and the extent of influence that systematic risks have on a company. Information disclosure, however, only contributes a minor impact on companies' systematic risks among many firm-specific factors.*

Practical implications – *The findings indicate that the impact of systematic risks on the firms, albeit not too significant, is still affected by their information disclosure. Therefore, companies should actively raise their information disclosure to help mitigate systematic risks. Meanwhile, while considering a company to invest in, investors should not ignore its corporate disclosure since it somehow might show that the firm is subjected to some kinds of risks but trying to hide them.*

Social implications – *Full disclosure of information will help the Vietnamese stock market become more dependable. The minimization of systematic risk is demonstrated through full disclosure, and it also gives investors access to the company's financial information so they can establish their own opinions. The companies that have good information disclosure will draw more investors due to their reliability and safety.*

Originality/value – *Our paper contributes to the existing literature on corporate disclosure by providing empirical evidence to point out the impact of systematic risks on non-financial companies listed on the stock exchange of Vietnam - an emerging economy.*

Keywords – Non-financial disclosure, Financial Risk, Equity, Systematic Risk, Listed companies, Vietnam Stock market

1. INTRODUCTION

Prior research has found a relationship between information disclosure and systematic risk. However, only a little research has been conducted on the impact of companies' information disclosure on systematic risk. Therefore, the purpose of this study is to show two main implications. First is understanding how information disclosure affects systematic risks through

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price fluctuations. To be more specific, providing good-quality disclosure will help investors have an overview of companies' financial situations, and as a result, enhance their financial decision-making in choosing appropriate stocks to put in their investment portfolio, thereby minimizing dangers in stock selection.

Second, it gives investors proof regarding the importance of corporate disclosure to the performance of the stock market. The paper shows that a higher level of corporate disclosure would decrease systematic risks, providing investors with protection and lowering investment risk.

Our research will be using two models based on two different beta approaches. The first approach will utilize regression to estimate beta from historical stock market price fluctuations. The second approach is to employ fundamental beta, in which will estimate levered beta using secondary data from financial statements and industry statistics and regression.

In recent years, especially during Covid-19 pandemic, the world has experienced a period of economic stagnation and Vietnam is no exception. Countless businesses had to pause their operating activities; many even went bankrupt. To help firms overcome this crisis, the State Bank of Vietnam had continuously lowered the lending interest rates, and deposit interest rates as well. Consequently, the flow of people's cash has poured into the stock market and made it flourish more than ever before. Following that, information disclosure of enterprises on the Vietnamese stock exchange has received increasingly extensive attention. Investors who are new to the market would tend to choose companies with a high reputation for safety's sake.

In Vietnam, there are two reputable stock indexes named VN30 - and HNX30 that track 30 listed companies that have the biggest market capitalization on Ho Chi Minh Stock Exchange (HoSE) and 30 listed companies with such criteria on Hanoi Stock Exchange (HNX), respectively.

These two are the best overall measurement for the performance of the Vietnamese stock market. Since VN30 and HNX30 have high representative value, our group's research will focus on non-financial companies included in these two indexes. Financial institutions are excluded due to the difference in capital structure and distinctive types of business, as well as the layout of such firms' financial statements. Besides, financial companies have risks unique to their doing of business, which also means that risk information sharing will be considerably different. To ensure consistency in the study, this research will not consider financial firms but focus on non-financial enterprises to obtain the most accurate results.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Literature review

In recent years, information disclosure has played a pivotal role in helping investors with their decision-making regarding investing in a listed company. There can be different ways to classify information disclosure in the corporate field, however, it can be divided into two main types: mandatory disclosure (MD) and voluntary disclosure (VD). MD is information that companies are required to make public, namely the annual report, to comply with the stock exchange as well as market regulations and national laws. VD, meanwhile, is the disclosure of additional information that companies 'volunteer' to reveal. The relationship between voluntary published company's information and the required return on equity are measured by using regression analyses Botosan (1997). They found out that for companies that attract a low analyst following, the more information disclosure does significantly lower the investors's required return on equity.

According to signaling theory, information disclosure is a mechanism for the firm to communicate with the public, to gain the main purpose of disclosure practices is to their investors and customers about firm value and performance (Spence, 1973). After all, reducing information asymmetry and helps it maintain competitive advantage of the firm (Bae et al., 2018), so companies are inclined to disclose good information to the public. This would motivate firms to enhance performance to have positive information to increase their disclosure levels, which would boost the firm's value. Diamond and Verrecchia (1991) investigated the impact of disclosure on corporate securities. The result revealed that a higher level of disclosure from big companies increases their securities' liquidity, which is explained that large institutional traders are particularly exert a pull on a significant reduction of information asymmetries. The empirical studies of Healy et al. (1999) and Leuz and Verrecchia (2000) also support the above conclusion.

In Vietnam, when it comes to corporate information reporting, annual report has been an important source that listed companies are required to make according to a framework that is stated in Circular 96/2020/TT-BTC, issued by the Ministry of Finance of Vietnam. As a result, all listed companies are obliged to publicize certain information including their corporate structure, financial situation, investment activities and Environment-Social-Governance (ESG); however, different companies will have different extent to which they comply with such criteria. Simply put, a company can voluntarily disclose more valuable information in their annual report than others. This difference can result from the

demand for disclosing information about the company itself. Companies with a growth potential will tend to supplement additional information in their financial reports to attract investors, while companies without such potential would only comply with the minimum requirement for statutory disclosure and not give out any other information. Therefore, we consider a firm's financial report as a primary source for both MD and VD. In this paper, we would use the disclosure scoring model developed by (Dang Anh Tuan et al., 2022), which uses annual reports of listed companies as input to evaluate the impact of their disclosure level on the Vietnamese stock market.

Talking about risks, a listed company is subject to a variety of financial risks, but they can be divided into two main types: systematic risk and unsystematic risk. Systematic risks are risks that can make an impact on a part or the whole market, while unsystematic risks refer to risks that affect a very specific group or an individual's security. Usually, the latter stems from inside the organization, within its operating mechanism, such as liquidity risks, credit risks, information asymmetries, etc. From an investor's perspective, they cannot expect to be rewarded for bearing unsystematic risks as they can be reduced by diversifying the assets portfolio. In contrast, systematic risks (or market risks) cannot be eliminated by doing so, which is why investors are more concerned regarding the sensitivity of a company's share to the market, and their expected returns when the market changes as well.

When a company has a good level of information disclosure, it can reduce information asymmetry risks as well as transaction risks such as reduce the stock price fluctuations in the market, increase stock liquidity, thus affecting the cost of equity capital and the value of the firm. This is seen when examining the relationship between information disclosure and financial risk, Ngo Thu Giang (2014). Nevertheless, although companies can somehow avoid such unsystematic risks by raising their disclosure levels, it demands more studies to shed light on the impact of information disclosure on how responsive listed companies are to systematic risks. Theoretical studies support the hypothesis that there exists a negative association between disclosure level and companies' financial risks including systematic risk. More specifically, greater information disclosure will enhance market liquidity as well as increase demand for corporate securities thereby reducing the cost of equity capital, through reduced transaction costs (Demsetz, 1968; Copeland and Galai, 1983; Glosten and Milgrom, 1985; Amihud and Mendelson, 1986 and Diamond and Verrecchia, 1991). A review of empirical research has also unfolded results in agreement with this statement (e.g., Healy et al., 1999; Leuz and Verrecchia, 2000; Hail, 2002; Botosan and Plumlee, 2002). Regarding the association between disclosure level and beta, Hassan et al. (2011) examined this issue for companies listed on the Egyptian Stock Exchange, where they follow the International Accounting Standards (IAS). Although its enforcement there is still weak, they do believe that those standards still have a certain extent of influence. Regressing beta on the level of voluntary disclosure, their result "*generally show a negative relationship between voluntary disclosure level and beta, consistent with predictions of a differential information model and theories about the economic consequences of increased disclosure.*"

In this research, we only look at the impact of information disclosure on a company's systematic risks, by using annual reports of 38 non-financial companies with highest market capitalization listed in the Vietnam's stock market as input. Financial companies are excluded since they have different operating as well as financial reporting structures. As for the result, we found out that in theory, the higher the disclosure level of a company, the less it is prone to systematic risk. However, when considering the results produced by these 38 top companies, another conclusion prevails: the level of disclosure only has an insignificant impact on companies' financial risks.

2.2. Hypothesis development

2.2.1. Asymmetric information and agency cost

"Lemon market" Akerlof's economic theory (Akerlof, 1970) is not only the basis for reflecting the ineffective operating mechanisms of the market, but also lays down the basic theoretical foundation of corporate information disclosure.

The theory of "Lemon market" refers to the fact that buyers, due to lack of information about the products held by sellers, lead to purchasing poor quality goods. He used the used car market to explain the problem of uncertain product quality. The fact is, most people who want to buy used cars are often unable to accurately evaluate the quality of cars for sale, meaning they cannot identify among the used cars, which ones still run well, which ones do not. This means the buyers would only evaluate the given products of average quality at best. Meanwhile, the sellers are the ones who know most about the conditions of the cars including various aspects such as maintenance, driving style, and record of historical accidents. As such, people with above-average-quality cars would not want to sell their goods on the market, since their cars are priced lower than their worth. Therefore, only poor-quality cars are traded, leading to very few people wanting to buy.

In general terms, this concept suggests that those with products of above average quality will tend to want to leave the market. The reason is that buyers' information about a certain product under asymmetric information conditions is unclear

and therefore they may be willing to pay a higher price for a product with poor quality and pay a lower price for high quality products. In theory, the impact of asymmetric information and heterogeneity in product quality can even lead to the disappearance of a market, described by Gresham's Law: "bad money chases good money", is considered one of the most traditional principles of classic economy.

Many markets tend to start with asymmetric information and sellers are not willing to accept prices below product quality over a long period of time, methods are needed to make sellers willing to offer necessary information about products to improve the impact of asymmetric information on the market.

Asymmetric information also appears in corporate information disclosure. Companies are owned and managed by different (groups of) people. While managers are responsible for operating, managing, and maintaining the operations of a company, owners (or investors) finance the company's development and operations. Thanks to the activities and positions of managers, they can gain a deeper understanding of the company's situation in the market, potential problems with its operations or even its financial problems. Meanwhile, owners have very little knowledge about such issues.

By analogy with Akerlof, information asymmetry can be observed, causing a conflict of interest to maximize benefits between managers and business owners. Investors' uncertainty about a company's situation can lead to adverse selection, which depends on the level of information asymmetry and how investors behave toward uncertainty. The problem of asymmetric information can cause financial inefficiencies, which in the worst case can lead to disruptions in financial supply, when investors are not willing to accept inefficiencies. In general, costs related to actions that are beneficial to the principal, but disadvantageous to the agent, such deviations in benefits are considered agency costs (Jensen and Meckling, 1976).

The second set of problems, arising from moral hazard, exists when a party is willing to accept risks or undertake unacceptable activities without knowing or knowing that the potential costs or burdens will be borne in whole or in part by another person. Applied to the case of agents and owners at the corporate level, managers may make decisions and activities that go against the interests of owners, due to information asymmetry between both sides.

In addition to introducing measures to regulate different interests, reducing information asymmetry between stakeholders will bring closer to a perfect market and help the participants reap its benefits. Corporate disclosure offers an opportunity to reduce this asymmetry by improving investors' knowledge. To achieve this, representatives must provide transparent, reliable information about the financial and business status of the enterprise, either on a voluntary basis or with regular mandatory reporting. However, it is a different story when businesses take advantage of this and only disclose good information, while hiding potential risks from external stakeholders, to attract capital inflows. Therefore, to reduce such behavior, mandatory reporting standards that set a minimum level of quality in relation to corporate disclosure must be established. Besides, effective information disclosure can be a strategic weapon for businesses when competing in the market.

In short, the operation of the market is inevitably affected by information asymmetries, which stems from the fact that one party (the agents) knows more information than the other parties (the owners) and their interest conflict with each other. This serves as the basis for the theory of "agency cost" and points out the important role of information disclosure in reducing information asymmetry between managers and investors.

2.2.2. Disclosure and the impact on systematic risks of the firm:

Kissings (2016) found out that: companies with high levels of financial leverage often tend to limit the level of information disclosure; large-scale companies often disclose more complete information than other companies; small-sized companies, and businesses with high market-to-book-value ratios often have better information disclosure levels. Their empirical research shows that a more comprehensive level of information disclosure by business organizations has a positive impact in reducing financial risk. Besides, asymmetric information causes uncertainty and improves the quality of information disclosure as a tool to reduce the cost of equity and costs related to capital mobilization, Cordella and Yeyati (1998), Baumann and Nier (2003).

Attaching Akerlof's "lemon market" theory to the stock market, suppose you are an investor who wants to buy common stock of a business on the market, but cannot distinguish between companies with high future growth potential and companies with potential risks and poor growth as information is not fully reflected in the market. Therefore, it is difficult for you to choose a stock price that truly reflects the quality of that company and often tends to choose the general market price between the stock price of a good company and the stock of a bad company.

Meanwhile, the company's managers or business owners often have the most in-depth view of the company's financial situation, business operations, and especially the potential risks the company is facing such as: high leverage ratio or problems in the internal management of the business. For companies with good financial and business situations, they will not be willing to sell shares when the company's stock value is being priced lower than the real value due to lack of information causing uncertainty. of investors. Therefore, only bad companies are always willing to sell their stocks on the market, and fewer and fewer people want to hold stocks, causing the market to operate inefficiently.

Uncertain information about the business would make investors more cautious in making investment decisions or investors will demand a higher profit, and the large difference between the bid price and stock offering prices as investors demand compensation for the increased transaction costs resulting from lack of information, increasing the cost of equity capital, Amihud and Mendelson (1986). Facing a higher cost of equity causes businesses to face heavier losses than businesses with lower costs of equity when facing systematic risk. Thus, by disclosing comprehensive information, companies can reduce the adverse price selection component of investment decisions for investors and reduce their cost of equity capital (Diamond and Verrecchia, 1991), thereby reducing the impact of systematic risk on businesses. This was also observed by Klein and Bawa (1976), Barry and Brown (1985), Coles and Loewenstein (1988), Handa and Linn (1993), Coles et al. (1995) and Clarkson et al. (1996) argue that greater disclosure can reduce the cost of equity capital through reducing the impact of estimated non-diversifiable risk. In a perfect market situation when all information is fully reflected in stock prices, investors are willing to increase demand for corporate securities. However, information asymmetry due to the poor quality of information disclosed by businesses leads to mis assessment of the real value of their securities on the market. This makes it difficult for investors to set the correct expected profit level for the risks that the business faces. This means that the expectations of the real value of securities expressed through market prices of businesses with a level of transparent information disclosure are more accurately evaluated by the market than those of businesses with transparent information disclosure. has a low level of information disclosure. Therefore, companies with a good level of information disclosure can partly reduce risks for investors and businesses when systematic risks occur.

In summary, there exists an inverse relationship between information disclosure and the level systematic risks have on the enterprises, and heightening the quality of information disclosure would help businesses to reduce their vulnerability to systematic risks. In summary, we see the important role of information disclosure quality in limiting the impact of systemic risk on businesses and show the inverse relationship between information disclosure and the impact of risk. system risk to the enterprise.

3. RESEARCH METHODOLOGY

In this study, the systematic risk of VN30 and HNX30 companies is estimated in two ways. Two approaches are used for estimating risk parameters; one is to use historical data on market prices for individual assets; the second is to estimate the betas from fundamentals.

According to the Historical Market Betas method, this is the conventional approach for estimating betas. The beta calculation is reflected in Eq (1). For companies that have been publicly traded for an extended period, it's relatively simple to calculate the returns investors would have gained on their investments within specific time frames, like weeks or months. These gains can then be linked to a market portfolio proxy for determining beta in the capital asset pricing model.

Estimating betas through a regression of stock returns against market returns:

The formula of the CAPM model used is:

$$R_j = \alpha + \beta * R_m \quad (1)$$

Where:

R_m: the daily market return

R_j: the daily return of a security

β : beta coefficient of a security

According to Fundamental Betas method:

The estimation of a firm's betas through regression is influenced by fundamental choices made by the firm regarding its

industry focus, operational leverage ratio, and the extent of financial leverage used. This research aims to examine an alternative approach to estimating betas, relying less on historical betas and emphasizing a deeper understanding of the intuitive foundations behind betas.

The beta of a firm is determined by three variables, including:
(1): The type of business or businesses the firm is in
(2): The degree of operating leverage in the firm
(3): The firm's financial leverage.

Then, our research model is:

$$\beta = \alpha_1 + \alpha_2 * DS \quad (2)$$

Where:

$$\beta = \text{Beta coefficient}$$

DS = Disclosure Index

3.1. Data Collection and processing

3.1.1. Data Collection

2008 was the year that Vietnam's stock market witnessed the strongest volatility since the global financial crisis in 2008, Vietnam's stock market in 2018. This was also the first year the stock market had undergone a decline after the uptrends in the previous 5 consecutive years; the stock index paralleled the growth momentum of the economy, achieving high growth, some years up to 47% (2017). Furthermore, during that period, there were many macro events affecting the entire world economy, most notably the Covid-19 pandemic, causing companies and business owners throughout the world to face various kinds of risks, especially systematic risks. This triggers a question that in a period full of such upheavals, whether the disclosure quality of a company can help it minimize the impacts of systematic risks on it. That's why we chose to start from the year of 2018 for our analysis.

In this research, we initially intended to examine all non-financial companies in VN30 and HNX30 indexes, which added up to 43 companies. However, during the data collecting process, there were 5 companies whose information disclosure was limited, and 3 more companies that lack data for price volatility, which are input specifically needed for model 1. For that reason, only 35 and 38 companies are tested in model 1 and 2 respectively.

3.1.1.1. Historical Market Betas

Our research paper relies predominantly on secondary data sourced from the audited annual financial statements of 38 companies listed on HOSE and HNX stock exchanges and stock exchanges between 2018 and 2022. The data were collected from reputable websites (FiinGroup and Vietstock) and are present in Appendix 1.

3.1.1.2. Fundamental Betas

As mentioned above, fundamental betas are measured by 3 variables: (1) The type of business, (2) The degree of operating leverage in the firm, (3) The firm's financial leverage. In this part of the scientific research, we will present how to collect data for 3 variables.

(1): The type of business:

The way to classify companies is based on Vietstock's classification: Vietstock chooses the NAICS 2007 standard (The North American Industry Classification System) to apply for industry classification because of its popularity, highly comprehensive, supported by many international organizations, has many similarities with Vietnam's VSIC 2007 sectoral system, and has a high logical order in the sectoral arrangement.

(2) The degree of operating leverage in the firm

This is a measure of the percentage of a company's operating expenses that consist of fixed costs.

A company with high operating leverage tends to exhibit greater fluctuations in operating income compared to a similar company with low operating leverage. Assuming all else remains constant, the increased variability in operating income tends to result in a higher beta for the high operating leverage firm.

Although operating leverage impacts betas, it's challenging to assess a firm's operating leverage from an external standpoint because income statements typically aggregate fixed and variable costs. An approximate measure of a firm's operating leverage can be obtained by observing how changes in operating income correlate with changes in sales.

Degree of Operating leverage = % Change in Operating Profit / % Change in Sales

(3). The firm's financial leverage.

With the assumption that other things remain constant, a rise in financial leverage will increase the equity betas of a firm. In essence, we anticipate that the steady interest payments on debt would boost earnings per share during prosperous periods but depress it during downturns. Higher leverage increases the fluctuation in earnings per share and elevates the risk associated with investing in the company's equity. If the entirety of the firm's risk falls on the shareholders, debt generates a tax shield or tax advantage for the firm. The relations among parameters are shown in Eq. (3).

$$\beta_L = \beta_u \left(1+(1-t)\left(\frac{D}{E}\right)\right) \quad (3)$$

Where:

β_L = Levered Beta for equity in the firm

β_u = Unlevered beta for the firm (i.e., the beta

of the firm without any debt)

t= Marginal tax rate for the firm

D /E =Debt/(Equity Ratio)

According to the Bottom-up beta method, when combining two assets, their collective beta is a weighted mean derived from the individual asset betas, where the weights correspond to their market values. As a result, a firm's beta represents a weighted average of the betas associated with all the distinct businesses it operates within.

In establishing the Information Disclosure Index (DS), a set of criteria for evaluating the extent of information disclosed in the Annual Report has been formulated. This table is constructed by integrating Circular 155/2015/TT-BTC and Circular 96/2020/TT-BTC with the criteria outlined in Standard and Poor (2003) and Botosan (1997). The specifics of the Disclosure Index are provided in Appendix 3 below.

3.2.2 Data Process

Microsoft Excel is employed to compute several financial metrics that were not originally included in the Financial Statement. These calculations are based on synthesized theory, resulting in the creation of a comprehensive set of figures. Stata 13.0 software is utilized to conduct regression analysis and conduct essential tests, including descriptive statistical analysis, Pearson correlation coefficient analysis, Pooled OLS regression model, variance change, and correlation assessments.

3.2.3. Sample description statistics

3.2.3.1. Model 1

Through the statistical analysis, the average beta of companies is 0.62, with the lowest value of 0.07, and the highest value of 1.62 and the standard deviation reach 0.47. The average disclosure index (DS) is 44.7, minimum of 34.4, and maximum of 52.2, with a standard deviation of 4.7.

Table 1. Statistics description of stock beta and disclosure index (Historical Market Beta method)

```
. sum BETA DS

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
        BETA |         35    .6195487     .472513   .0779066    1.61848
          DS |         35    44.68571     4.71076       34.4       52.2
```

Source: Authors, 2023

3.2.3.2. Model 2

Through the statistical analysis, the average beta of companies is 0.56, with the lowest point of -7.5, and the highest point of 2.99 and the standard deviation reach 0.8. The average disclosure index (DS) is 44.6, with a minimum of 17.5, and maximum of 53, with a standard deviation value of 5.5.

Table 2. Statistics description of stock beta and disclosure index (Fundamental Market Beta method)

```
. sum BETA DS

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
        BETA |        190    .5664547    .7942714     -7.5403     2.9914
          DS |        190        44.6    5.481438        17.5         53
```

Source: Authors, 2023

4. RESULT AND DISCUSSION

4.1. Correlation analysis

The Pearson Correlation Coefficient is applied to measure the correlation between two variables including BETA and DS for both 2 models below.

4.1.1. Model 1

The p-value is 0.3386. Since this is more than 0.05, the Pearson Correlation between these two variables is not statistically significant. However, based on the results of previous studies on the same topic, the authors suspect that the independent variable still influences the dependent variable. Therefore, DS will still be retained to consider the influence relationship through regression analysis.

Table 3. Correlation coefficient (Historical Market Beta method)

```
. pwcorr BETA DS,sig

             |     BETA       DS
-------------+------------------
        BETA |   1.0000
             |
             |
          DS |   0.1667   1.0000
             |   0.3386
```

Source: Authors, 2023

4.1.2. Model 2

In the model, DS negatively correlated at -0.2128 with Beta, reaching a significant level of 10.

Table 4. Correlation coefficient (Fundamental Market Beta method)

```
. pwcorr BETA DS,star(0.1)

             |     BETA       DS
-------------+--------------------
        BETA |   1.0000
          DS |  -0.2128*  1.0000
```

Source: Authors, 2023

4.2. Results of regression analysis

After looking at the correlation coefficient between the variables in the study research, the impact of the DS on the Beta of listed companies is estimated by using the Pooled OLS regression model for 2 models.

4.2.1. Model 1

Table 5. Regression results model 1 (Historical Market Beta Model)

```
. reg BETA DS

      Source |       SS           df       MS      Number of obs   =        35
-------------+----------------------------------   F(1, 33)        =      1.47
       Model |  .414205241         1  .414205241   Prob > F        =    0.2347
    Residual |  9.32824918        33  .282674217   R-squared       =    0.0425
-------------+----------------------------------   Adj R-squared   =    0.0135
       Total |  9.74245442        34  .286542777   Root MSE        =    .53167

------------------------------------------------------------------------------
        BETA | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
          DS |   .0234303   .0193559     1.21   0.235    -.0159495    .0628101
       _cons |  -.4899881   .8695871    -0.56   0.577    -2.259176     1.2792
------------------------------------------------------------------------------
```

Source: Authors, 2023

Due to the p-value =0.235 which was greater than 10%, disclosure index (DS) was not statistically significant with BETA in this model.

4.2.2. Model 2

Table 6. Regression results model 2 (Fundamental Market Beta Model)

```
. reg BETA DS

      Source |       SS           df       MS      Number of obs   =       190
-------------+----------------------------------   F(1, 188)       =      8.91
       Model |  5.39805518         1  5.39805518   Prob > F        =    0.0032
    Residual |  113.835813       188  .605509646   R-squared       =    0.0453
-------------+----------------------------------   Adj R-squared   =    0.0402
       Total |  119.233869       189   .63086703   Root MSE        =    .77815

------------------------------------------------------------------------------
        BETA | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
          DS |  -.0308314   .0103261    -2.99   0.003    -.0512013   -.0104615
       _cons |   1.941535   .4639898     4.18   0.000      1.02624    2.856831
------------------------------------------------------------------------------
```

Source: Authors, 2023

The regression results (Table 6) show that the variable: disclosure index (DS), has a negative impact on the systematic risk of 38 listed enterprises of high capitalization and liquidity on the Vietnamese stock exchange market with the coefficient reaching a significant level of 5% due to the P-value=0.003.

To check for defects in the model, two tests included the Heteroscedasticity test by White test (Table 7), and the Autocorrelation test using the Wooldridge method (Table 8).

Table 7. Heteroscedasticity test

```
. imtest,white

White's test
H0: Homoskedasticity
Ha: Unrestricted heteroskedasticity

    chi2(2) =   0.54
Prob > chi2 = 0.7648

Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	0.54	2	0.7648
Skewness	1.57	1	0.2106
Kurtosis	1.05	1	0.3046
Total	3.16	4	0.5318

Source: Authors, 2023

Table 8. Autocorrelation tests

```
. xtserial BETA DS

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      37) =      1.013
           Prob > F =      0.3208
```

Source: Authors, 2023

The results show that the model had no self-correlation, and no variable variance. Then, the OLS regression model is applied to this research.

This leads to the regression equation as follows:

Beta = 1.941535 -0.308314*DS
The coefficient of the variable DS is -0. 308314, negative impact on beta. It means that when the company's information disclosure score increases only by 10 points, the beta coefficient decreases by 3. In other words, the beta coefficient would drop sharply even if the company only improves information disclosure by a small extent.

4.3. Results discussion

Based on data from listed companies in the period from (2018-2022), results from the regression show the effect of disclosure information on systematic risk as follows:

4.3.1. Model 1

The result from Table 4.2.1 shows that the model is not statistically significant. Also, the disclosure index (DS) has no relationship with the systematic risk of enterprises (Beta). This is not consistent with the evidence from previous approaches and researcher's expectations. In other words, the finding of no relationship between disclosure information and beta may be concluded due to an inappropriate estimation method of beta being involved. Therefore, this study recommends the following authors not to follow the direction of this model by estimating the beta through historical market data.

4.3.2. Model 2

The disclosure index (DS) has a negative impact on systematic risk. Because Beta = 1.941535 -0.308314*DS, it means that beta has a negative relationship with DS. The disclosure index is calculated from the enterprise's annual report, offering readers an insight into the company's historical background, production, and business operations throughout the year. It encompasses ongoing and completed projects, details on revenue composition, crucial financial metrics pinpointing areas of profitability, and key business sectors. Especially, the report delves deeper into potential risks the business might encounter and strategies to mitigate them. Consequently, a higher information disclosure index signifies a greater capacity for the business to recognize and manage risks, thereby aiding in the containment of financial risks. This is consistent with theoretical models, and findings from previous empirical information models, also the researcher's expectations.

However, when considering the results produced by 38 top companies in the Vietnamese stock market, another conclusion prevails: the level of disclosure only has an insignificant impact/or not too related to the company's financial risks.

According to table 6, although there is a negative relationship with beta, DS does not have a large impact on systematic risk. With Adj R-squared=0.0402, DS only explains 4.02% of the variation in the beta variable. Variation in beta is caused by other factors and random errors.

In terms of theory, according to the CAPM, information doesn't necessarily require explicit consideration as it's presumed to be inherently included in asset prices. Thus, information plays an unimportant role in the traditional CAPM. Garsombke (1979), Dhaliwal et al. (1979) and Firth (1984) confirmed that the level of disclosure did not hold significant value in explaining the risk associated with the firm. Also, The potential advantages stemming from increased disclosure might be too small to detect and evaluate through empirical observation and testing (Botosan, 2000; Amihud and Mendelson, 2000). On the other hand, Hassan (2011) showed that risk appears to have a closer correlation with firm characteristics like growth, size, and the book to market ratio (BTMR): each of these independent factors is generally strongly significantly associated with risk regardless of the beta-estimation model involved. In other words, larger size firms with low growth rate and high book to market ratio witness a higher risk.

5. CONCLUSION

5.1. Findings

The report shows an inverse relationship between information disclosure and the impact of systematic risks on the Vietnamese stock market. Following that, the findings demonstrate that higher information disclosure quality will lower the financial risks faced by businesses and investors in the financial market. However, the approach of estimating systematic risks through historical values of stocks on the Vietnamese stock market shows that information disclosure has no visible impact on stock price fluctuations on the Vietnamese stock market. The reason for this conclusion is due to information asymmetry between internal businesses and investors. The gap between the information disclosed to investors and the information that the company holds, especially bad information about the company that might have a negative impact on their stock prices – leads to uncertainty regarding the connection between the quality of corporate information disclosure and market-based stock price fluctuations. Therefore, there may be risks when investors decide to purchase or sell stocks and consider the stock's market price to be favorable while being unaware of any information that might be harmful to their investment.

A negative correlation between beta coefficient and information disclosure is shown by the systematic method to risk estimation using "fundamental beta" and "bottom-up beta," however this correlation is not statistically significant. Thus, it can be shown that information disclosure has an impact on the company's levered beta and the classification of the industry as a measure of systematic risk. To lessen the financial risks the company confronts, businesses must actively increase the quality of information disclosure.

5.2. Policy Implications

The model's findings suggest that the disclosure index (DS) has the opposite effect on systematic risk for 35 top companies in model 1 and 38 top companies in model 2 on the Vietnamese stock market. The government should take action to encourage information disclosure by businesses to reduce systematic risk. Furthermore, to lower the systematic risk, in their annual report, companies should provide additional details about their status, unresolved matters, financial health indicators, and investments undertaken throughout the year. Businesses need to proactively collect and disclose better

information to avoid systematic risks for the company as well as investors. Through the two beta models that the team researched, investors in the Vietnamese market through the first price fluctuation model need to be careful in their buying and selling decisions. By applying "fundamental beta" in model two, we can show that companies must employ leverage more wisely if they want to produce positive outcomes.

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Appendix 1. Company Name and Symbol

No.	Name	Symbol	Stock Exchange
1	Bim Son Cement JSC	BCC	HNX
2	C.E.O Group Joint Stock Company	CEO	HNX
3	Alpha Seven Group JSC	DL1	HNX

4	Thanh Dat Investment Development JSC	DTD	HNX
5	Doan Xa Port JSC	DXP	HNX
6	Tasco Joint Stock Company	HUT	HNX
7	Licogi 14 JSC	L14	HNX
8	Investment And Construction JSC No.18	L18	HNX
9	Lam Thao Fertilizers and Chemicals JSC	LAS	HNX
10	Lam Dong Investment & Hydraulic Construction JSC	LHC	HNX
11	Vinacomin - Nui Beo Coal JSC	NBC	HNX
12	Tien Phong Plastic Joint Stock Company	NTP	HNX
13	Southern Gas Trading Joint Stock Company	PGS	HNX
14	Petrolimex Petrochemical Corporation	PLC	HNX
15	PetroVietnam Urban Development JSC	PVC	HNX
16	PetroVietnam Technical Services Corporation	PVS	HNX
17	Thang Long Investment Group JSC	TIG	HNX
18	TNG Investment and Trading JSC	TNG	HNX
19	Vinacomin - Vang Danh Coal JSC	TVD	HNX
20	Nam MeKong Group JSC	VC3	HNX
21	VNSTEEL - VICASA JSC	VCS	HNX
22	Hoa Phat Group JSC	HPG	HOSE
23	FPT Corporation	FPT	HOSE

24	PetroVietnam Gas Joint Stock Corporation	GAS	HOSE
25	Masan Group Corporation	MSN	HOSE
26	Mobile World Investment Corporation	MWG	HOSE
27	No Va Land Investment Group Corporation	NVL	HOSE
28	Phat Dat Real Estate Development JSC	PDR	HOSE
29	Viet Nam National Petroleum Group	PLX	HOSE
30	PetroVietnam Power Corporation	POW	HOSE
31	Saigon Beer - Alcohol - Beverage Corporation	SAB	HOSE
32	Vingroup Joint Stock Company	VIC	HOSE
33	Vietjet Aviation Joint Stock Company	VJC	HOSE
34	Viet Nam Dairy Products Joint Stock Company	VNM	HOSE
35	Vincom Retail Joint Stock Company	VRE	HOSE

Source: Authors, 2023

Appendix 2. Company Name and Symbol

No.	Name	Symbol	Type of business
1	Bim Son Cement JSC	BCC	Products to produce non-metallic mineral products
2	C.E.O Group Joint Stock Company	CEO	Real estate developme-nt
3	Indochine Import Export Investment Industrial JSC	DDG	Water, waste, and other systems
4	Alpha Seven Group JSC	DL1	Transit and passenger

			transport by road
5	Thanh Dat Investment Development JSC	DTD	Construction of houses and buildings
6	DoanXa Port JSC	DXP	Transporta-tion support
7	Tasco Joint Stock Company	HUT	Heavy industrial and civil constructi-on
8	Licogi 14 JSC	L14	Real estate developme-nt
9	Investment And Construction JSC No.18	L18	Heavy industrial and civil constructi-on
10	Lam Thao Fertilizers and Chemicals JSC	LAS	Productio-n of chemicals and pharmaceuticals
11	Lam Dong Investment & Hydraulic Construction JSC	LHC	Heavy industrial and civil construction
12	Vinacomin - Nui Beo Coal JSC	NBC	Mining (except oil and gas)
13	Tien Phong Plastic Joint Stock Company	NTP	Production of plastic and rubber products
14	Southern Gas Trading Joint Stock Company	PGS	Natural gas distribution
15	Petrolimex Petrochemical Corporation	PLC	Production of petroleum and coal
16	PetroVietnam Urban Development JSC	PVC	Mining support activities
17	PetroVietnam Technical Services Corporation	PVS	Mining support activities
18	Thang Long Investment Group JSC	TAR	Food production
19	TDT Investment and Development Joint Stock Company	TDT	Production of garment products

20	Thang Long Investment Group JSC	TIG	Real estate
21	TNG Investment and Trading JSC	TNG	Production of garment products
22	Vinacomin - Vang Danh Coal JSC	TVD	Mining (except oil and gas)
23	Nam MeKong Group JSC	VC3	Real estate development
24	VNSTEEL - VICASA JSC	VCS	Products to produce non-metallic mineral products
25	Hoa Phat Group JSC	HPG	Production of basic metal products
26	FPT Corporation	FPT	Publishing industry - Except the internet
27	PetroVietnam Gas Joint Stock Corporation	GAS	Natural gas distribution
28	Masan Group Corporation	MSN	Food production
29	Mobile World Investment Corporation	MWG	Home electronics store
30	No Va Land Investment Group Corporation	NVL	Real estate development
31	Phat Dat Real Estate Development JSC	PDR	Real estate development
32	Viet Nam National Petroleum Group	PLX	Wholesale of consumer goods
33	PetroVietnam Power Corporation	POW	Generation, transmission, and distribution of electricity
34	Saigon Beer - Alcohol - Beverage Corporation	SAB	Production of beverages and cigarettes

35	Vingroup Joint Stock Company	VIC	Real estate development
36	Vietjet Aviation Joint Stock Company	VJC	Air transport
37	Viet Nam Dairy Products Joint Stock Company	VNM	Food production
38	Vincom Retail Joint Stock Company	VRE	Real estate

Source: Authors, 2023

Appendix 3. Disclosure Index scoring criteria

Quota	Maximum score
I. Company introduction, general information	
1. General information	1
2. The process of formation and development	1
3. Professions and areas	
a. Professions	1
b. Area	1
4. Information about the governance model, business organization, and management apparatus	
a. Governance model	1
b. Structure of the management apparatus	1
c. Subsidiaries, affiliates	1
5. Development orientation	
a. The main objectives of the company	1
b. Medium and long-term development strategy	1
c. Sustainable development goals and main programs related to the short and medium term of the company.	2
6. Risk exposure company? Armored response?	2
II. Operation situation during the year	
1. Production and business activities	
a. Results of production and business activities during the year. (Discussion: State major changes and fluctuations in business strategy, revenue, profit, cost, market, product, supply, number of	2

orders but not delivered, and projects developed)	
b. Implementation situation compared to the plan. Compare the results achieved during the year compared to the planned targets and adjacent year targets. (Discussion: Specific analysis of the reasons for not meeting/meeting/exceeding targets compared to the plan and compared to the adjacent year)	2
c. Market share.	2
2. Organization and personnel	
a. List of executive boards	1
b. The number of officers, employees, or personnel structure	1
c. Average salary per employee or salary and bonus policy	1
3. Investment situation, implementation of projects	1
4. Financial situation	
a. financial situation (Example: Total value of assets, net receipts, profit after tax, rate of profit paid dividends)	4
b. Key financial indicators (e.g., quick solvency, capital structure, operating capacity, profitability)	4
c. Effective financial indicators (Example: ROA, ROE)	2
5. Shareholder structure, change of owner's investment capital.	2
6. Environmental Impact Report	2
III. Expected Information	
1. Forecast market share.	2
2. Cash flow forecast	2
3. Profit forecast	2
4. Sales forecast	2
IV. Report and evaluation of the Board of Directors	

1. Evaluation of production and business results (Overview analysis of the company's activities compared to the plan and results of production and business activities in the past)	2
2. Financial situation (Asset situation, liabilities situation)	2
3. Improvements in organizational structure, policies, management	1
4. Future plans and solutions	2
5. Assessment report related to the company's environmental and social responsibilities	2
V. Evaluation of the Administrative Council on the company's operations	
1. Evaluation of the Administrative Council on the operational aspects of the company	1
2. Evaluation of the Administrative Council on the activities of the Board of Directors	1
3. Plans and orientations of the Administrative Council	1
VI. Financial Statements	
1. Audit opinion	2
2. Financial Statements	2
VII. Total score	61

Source: Authors, 2023