# The Impact of Sustainability Reporting on Firm Valuation Empirical Evidence from Singapore

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**Abstract**

Globally sustainability reporting (SR) has gained significance as one of the major concerns for businesses because these reports communicate information for the wider interest of the stakeholders. Therefore, the core objective of this investigation is to find out the relationship among sustainability reporting and valuation of firms listed in the Singaporean Capital market. The study has utilized an existing framework developed for sustainability reporting's (SR) evaluation and assess how different proxies of SR influence the valuation of a firm. The sample of the firms is based on 450 firms listed on the Singaporean stock market (SSM) based on 3 years of data from 2016-2018. The study used panel data based on a random-effects regression model to perform multivariate regression. The outcomes of this study recommend that SR has a positive association with firm valuation.

*Keywords*: *sustainability reporting (SR), firm valuation, Singapore, GRI, Panel data*

## 1. Introduction

Investors are realizing the fact that the financial growth of an organization is not enough for firm performance for the long term (Chetthamrongchai & Jermsittiparsert, 2019; Pamornmast, Sriyakul, & Jermsittiparsert, 2019). Therefore, the firms have to focus on the other aspect of the firm's performance such as social, economic and environmental performance as well (Swanson, 2015; Kerdpitak & Jermsittiparsert, 2020). Therefore, SR not only helps the firms in strategy formation, operations of the firm, and economic performance but it also aids them in many other sectors including social welfare, environment and risk management to enhance the confidence of shareholders on firm performance (Loh, Thomas, & Wang, 2017; Siew, 2015). Many researches have demonstrated that there is an existence of a relationship between SR and firm valuation, while the majority of the examinations has explicitly focused on the developed markets. (Ioannou & Serafeim, 2017; Yadav, Han, & Rho, 2016). There are some researches available in Singapore based on the issue of sustainability but these studies cannot be generalized due to small sample size and limited to some industrial segments only (El Ghoul, Guedhami, & Kim, 2017; Loh et al., 2017).

The study has utilized a common approach consistent with previous researches i.e. Global Reporting Initiative (GRI) because it is a comprehensive approach to evaluate sustainability disclosure (Misic, 2016; Zharfpeykan, 2017). Based on the guidelines proposed by GRI, SR disclosures can be divided into four areas including financial, environment, society and governance. Firms can improve their

sustainability by making use of extensive disclosure guidelines (Bhattacharya, Oppenheim, & Stern, 2015; Loh et al., 2017; Siew, 2015). While, in theses fours areas, listed firms have achieved gradual growth over the period of time in Singapore. As shown in Figure 1, expect governance, where the pace of growth is slow, in all other areas, there is a reasonable growth in SR as compared to the previous year.
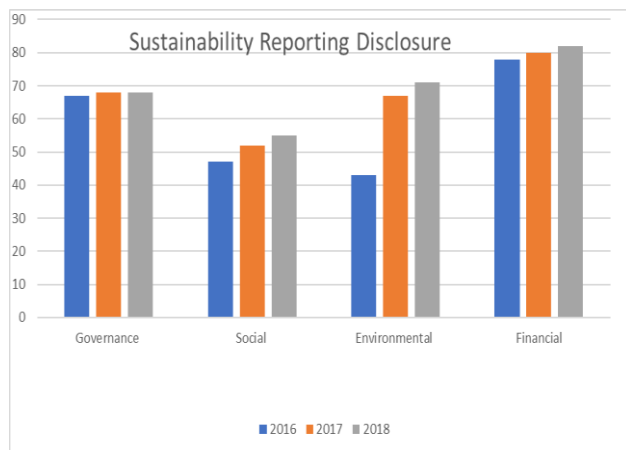


Figure 1: Sustainability Reporting Disclosure
Source: (Liu, Demeritt, & Tang, 2019)

In Asia, CSR is a relatively recent debate and there is the scarcity of literature on this issue in this region (Rezaee, 2016). Therefore, this study is interested in investigating the role of sustainability towards firm value, and this investigation will help to improve the sustainability disclosure strategies in Singapore. This paper examines the association between organizational sustainability disclosure and firm valuation. Along with addressing the research issue, this study offers a significant contribution to existing research on the association between SR and firm valuation by providing empirical evidence from developed market's context other than the UK and the US.

## 2. Literature Review

CSR and sustainability overlap in literature. These two terms can be differentiated with an argument that sustainability is a broader term and CSR is an extension of sustainability and helps to

achieve the sustainability goals. Actually, there are a few shared characteristics in disclosure techniques and corporate social responsibility is generally considered a part of sustainability. Recently, researchers have begun to focus on the potential relationship of sustainability disclosure with market valuation, in different countries, for example, (Bergman, Leisinger, Bergman, & Berger, 2015; Lasrado & Pereira, 2018; Todorov, Akbar, Todorov, & Akbar, 2018). Therefore, the rising significance of CSR, more research has been carried out. For example, Esteban-Sanchez, de la Cuesta-Gonzalez, and Paredes-Gazquez (2017) and Senyigit and Shuaibu (2017) provided empirical evidence on the positive association among CSR and financial performance of the banking sector. Moreover, Hou, Liu, Fan, and Wei (2016) used a sample of 55 studies to carry out a meta-analysis. Results of their investigations revealed that CSR is positively associated with firm valuation. Generally, it can be said that components of such as social perspective as well as in terms of environmental responsibility offers significant benefits to the organization.

Socially aware organizations are embracing sustainability activities, in addition, researchers, nowadays are investigating the association between firm valuation and sustainability. Based on the Dow Jones Sustainability Index (DJSI), Rezaee (2016) stated that sustainability practices significant and positive influence on the maximization of wealth. Furthermore, by examining the data of top 110 and 293 firms respectively, Przychodzen and Przychodzen (2015) and Whelan and Fink (2016) concluded that companies when indulging in sustainability can get better results particularly in terms of revenue increase, return on equity, earnings per share, operational cash flows. Moreover, firm valuation is positively affected by disclosing a sustainability report and it elaborates that investors see these reports positively to predict the generation of future profitability (Ioannou & Serafeim, 2017; Utama, 2011; Yadav et al., 2016).

While some studies have different finding as compared to the most dominant positive relationship with firm valuation. For instance, the in the UK, some researchers dis not found a positive association of sustainability reporting and shareholder's return (Chaklader & Gulati, 2015; De Klerk, de Villiers, & van Staden, 2015). Morioka and Carvalho (2016) investigated top 56 firms, as per Global indices from 1999 to 2005 and divided them into two groups, and the research results showed that SR negatively influences the performance of a firm. Moreover, the results of the paper are additionally opposing to existing developed relationship and stated that due to environmental disclosure had a moderating impact of on the association among earnings and market value a German firms, whereas, this relationship was not valid in the context of Australian and France firms (Fatemi, Glaum, & Kaiser, 2018; Semenova & Hassel, 2016). Additionally, Cho, Michelon, Patten, and Roberts (2015) claimed that markets do not respond significantly on the disclosure of sustainability reports, while a positive response is seen by the firms pertaining high-quality reporting than that of firms with low-quality reporting. Almilia and Budisusetyo (2009) and Elsewhere Stanisic (2015) have not found any empirical evidence from the banking sector of Europe, that SR is positively associated with a market valuation.

This global research shows that there is no conclusive relationship between firm value and SR because some countries show firm value is positively associated with SR and in many others, a negative relationship exists. In the meantime, different perspectives have been investigated too. Furthermore, researchers suggest that during the recession firms disclose more SR reports because these disclosures help firms gain competitive advantage and bifurcate their products and services which enhances the trust of stakeholders (García-Sánchez, Cuadrado-Ballesteros, & Frias-Aceituno, 2016; Lee & Hwang, 2019). Scholars like, Wang, Tong, Takeuchi, and George (2016) suggest two primary factors that persuade the organizations to disclose CSR reports: a better relationship with stakeholders and the conformation of operational norms of stakeholders partners, accordingly Loh and Nguyen (2018) stakeholders feel more confident because SR reporting clarifies that firm management is responsible and trustworthy. Loh et al. (2017) investigated in the context of Singapore and stated that organizations here revealed that SR reporting and shareholder's equity were positively associated with each other.

Association between SR and firm valuation of an organization is explained by many existent theories. Any single theory cannot explain the concept of SR because it is difficult to find and merge all concepts in a single framework. Agency theory, stakeholders, signaling theory and legitimacy theory are some common theories to explain SR. It is illustrated by the agency theory that companies disclose about the environment and social welfare voluntarily and the motive behind is to avoid the legal costs (Jensen & Meckling, 1976). This decrease in the costs will influence the risk profile and incomes of organizations and it will affect the market value of the firm. Moreover, Signal theory proposes that firms reporting environment problems are actually giving a signal that they have a proactive strategy for the environment and are motivated to inform the investors and stakeholders. The theory further specified that organizations that try to focus on environmental issues, actually, they are sending a positive signal that they are occupied with proactive environmental planning. Due to these positive signals, investors in capital markets, are more interested in these firms. According to legitimacy theory, the firm valuation increases when SR discloses the data for the legitimization of firm behavior to appeal to stakeholders and develops a public perception about the business. In the case of social and environmental accounting, this theory is commonly used. Based on the arguments above, the flowing hypothesis is proposed:

*Hypothesis 1 (H1) Firms not offering SR have a lower firm valuation than the firms offering SR.*

Quality of the report is also a major concern rather than offering SR or no in any context. SR has certain benefits as it attracts the talented and motivated workforce, on the other hand, firms not offering SR will bear the future costs in terms of decrease in profits and increase in legal and R&D cost to shareholders thus, firms that offer SR, results in increased firm valuation. Furthermore, in managerial context, information asymmetry between management and shareholders can be reduced through high-quality reporting, as it provides sufficient assurance to the shareholders with respect to operational activities and performance, which, resultantly decreases the cost bared by the shareholders for information. Likewise, the quality of sustainability reporting portrays a better image of profitability of a company, the higher management provides more confidence to shareholders, to make less risky and more efficient decisions. Accordingly, the following hypothesis proposed:

*Hypothesis 2 (H2) Firms with less sustainability disclosure will have a lower firm valuation than firms with high sustainability disclosure.*

## 3. Data and Methodology

### 3.1 Sample Size and Sources of Data

This sample of the study covers companies listed on the SSM's mainboard. The total sample size is 450, amongst which delisted, the firms that are missing with data on any of the studies' variables are excluded. Moreover, the companies that are listed on the secondary board are excluded. The reason for considering only the Main market firms is because they are more established and more exposed to the public eye than secondary markets and significant market capitalization lies with these main market firms. This study is based on the firms that have full coverage of data during 2016-2018 and consisting of 1350 observations. The data is extracted from Bloomberg for financial variables such as firm value. For sustainability reporting, all information is publicly available, of which major source is the financial statements.

### 3.2 Sustainability Reporting

The current study considers SR, the disclosure of non-financial information based on the components i.e. governance, economic, social and environmental. This study measures the SR level of a firm by calculation a score using a measurement procedure by ASEAN CSR Network and Centre for Governance, Institutions and Organizations. While this scheme is based on the Global Reporting Initiative (GRI), it has 27 criteria related to governance, economic, social and environmental, and prior studies used this to measure SR variable. firms (Fatemi et al., 2018; Hou et al., 2016; Semenova & Hassel, 2016).

A firm is considered as disclosing firm with respect to SR if significant data is disclosed, for any one form the environmental, social, governance and financial components of the SR. For measuring the SR, the data disclosed will be evaluated for each of the four parameters and will calculate a total score, the SR score. For the firms that are not disclosing any data on sustainability, the score will be zero.

### 3.3 Methodology

In this paper, we utilized the Ohlson model as the benchmark model, which is additionally utilized by (Yadav et al., 2016). In the extant literature, testing the association between accounting information and firm value has been defined as value relevance of accounting information (Barth, Beaver, & Landsman, 2001). It points out the capability of accounting information content to explain the firm value or stock returns (Vishnani & Shah, 2008). If the information has explanatory power on firm value, it is termed as value relevant (Filip & Raffournier, 2010; Thi & Schultze, 2011). The present study presumes that firm value is dependent on accounting information, expressed as follows:

**firm value = f (accounting information)**

The above function does not provide any explanation of accounting information that should be used in valuation. Therefore, this study has decided to use a price model given by Ohlson (1995). Then, we included the sustainability score dummy variable, based on the arguments that other earnings and book value of equity share piece is influenced by other accounting information SR. Firm value significantly varies also among industries as evidenced by Lev (2000). Controlling for industry effect can help to identify unobserved heterogeneity at the industry level (Klapper & Love, 2004). Industry variations are controlled based on the industry categorization given by SSM. Finally, to examine the relationship between SR and firm valuation (H1), the formal model is presented below:

$$MV_{it} = \beta_0 + \beta_1 SR1_{it} + \beta_2 IND_{it} + \varepsilon_{it}$$

where

$MV_{it}$= Share price per share for a firm after four months following the year t and firm i,

$SR1_{it}$= It is a dummy variable equal to 1 if the firm is providing sustainability reports for the year covered and 0, otherwise.

$IND_{It}$= it is a dummy variable based on the industry classification based on ten industries.

$\varepsilon_{it=}$ error term

The reason for taking the share price at four months at the end of the financial year is that accounting information cannot be available at the end of the reporting period as there is a 2-4-month delay before the announcement of the audited annual report. After examining the relationship between having sustainability reporting or not and the firm value, we further investigate the relationship between the quality of sustainability reporting and market value to test the H2 hypothesis. Thus, we replace the dummy variable SR1 in Model (1) with the

sustainability score SR2 and following Model (2) was developed:

$$MV_{it} = \beta_0 + \beta_1 SR2_{it} + \beta_2 IND_{it} + \varepsilon_{it}$$

where

$MV_{it}$= Share price per share for a firm after four months following the year t and firm i,

$SR2_{it}$= Score of sustainability reporting at the year t and firm i,

$IND_{It}$= it is a dummy variable based on the industry classification based on ten industries.

$\varepsilon_{it=}$ error term

## 4. Results and Analysis
## 4.1 Descriptive Statistics

Table 1 presents a descriptive analysis of all variables included in the study.

Table 1
*Descriptive Statistics*

| Variable | Mean | Min. | Max. | St.D |
|---|---|---|---|---|
| SR1 | .437 | 0 | 1 | .521 |
| SR2 | 17.346 | 0 | 89.04 | 23.481 |
| MV | 28.47 | 0.7 | 79 | 32.342 |

MV = Share price of a firm, SR1= A dichotomous variable, 1 for firms disclosing sustainability reports, otherwise 0, SR2= SR Score

The mean value of SR1 .437, whereas the mean value of SR2, is 28.47, which shows that averagely, firms are meeting17.346% of the expectations of the sustainability reporting. This figure is considered very low, especially in the context of Singapore because it is developed markets like the UK and the US.

Additional analysis is performed to see how many firms are providing SR. Results are presented in Table 2. The statistics show that, out of the 450 firms in the sample, 234 has offered SR, that shows that 52% of sample firms are providing stakeholders with SR to support in

decision making. While Table 1 shows that, among the 234 firms that are offering SR, the rate of the average score of SR, that shows the quality of SR is 52.

Table 2
*Sustainability reporting score by the firm.*

|  | **Min** | **Max** | **Average** |
|---|---|---|---|
| Total | 35.7 | 89.04 | 47.8% |

Generally, almost half of the firm in Singapore do not offer disclosure on SR, and, the firms that offer SR, the quality needs significant improvement because the average SR score is 47.8% that is even less than 50%, despite the fact that Singapore is a developed country. In addition, this study also performed the sector-wise analysis of SR score. Findings of the analysis are reported in Table 3. Some of the sectors have higher scores for example, as the SERV sector has the highest score, while AGR has the lowest score. However, for some sectors, Singaporean regulators need to put efforts to enhance the SR by the listed firms in Singapore.

Table 3.
*Average Sustainability Reporting Score by Sector.*

| Sector | **Average Sustainability Reporting Score** |
|---|---|
| Agriculture (AGR) | 32.0 |
| Commerce (COM) | 33.2 |
| Construction (CONS) | 39.5 |
| Finance (FIN) | 47.3 |
| Hotels (HOT) | 42.7 |
| Manufacturing (MFG) | 44.9 |
| Mining (MINQ) | 42.6 |
| Properties (PROP) | 47.5 |
| Services (SERV) | 49.4 |
| Transport (TSC) | 41.5 |

## 4.2 Correlation Analysis

In addition to descriptive analysis, the correlation among constructs was also performed. It is observable for Table 4, the correlations among dependent variable MV and independent variables SR1 and SR2 is .28 and .37, positive and significant. It shows that the SR will improve the valuation of a firm. Whereas, the correlation between independent variables SR1 and SR2 is .69 i.e. less than .8. Therefore, the issue of multicollinearity can be ignored in this context (Hair, Bill, Barry, & Anderson, 2006; Mirza, Malek, & Abdul-Hamid, 2019a, 2019b).

Table 4
*Correlation Matrix*

|  | **MV** | **SR1** | **SR2** |
|---|---|---|---|
| MV | 1 |  |  |
| SR | 0.28* | 1 |  |
| SR2 | 0.37* | .69** | 1 |

*Significance level (0.01\*,0.05\*\*,0.10\*\*\*)*
MV = Share price of a firm, SR1= A dichotomous variable, 1 for firms disclosing sustainability reports, otherwise 0, SR2= SR Score

Before, moving towards the regression analysis, this study has performed some diagnostic test to assess the presence of autocorrelation and heteroskedasticity in the panel data set. If this issue is not addressed, it will result in biased statistical inference. Results of the diagnostic tests are provided in Table 5.

Table 5
*Test for serial correlation and heteroskedasticity*

| **Wooldridge Test for Auto-Correlation** |  | **Breusch-Pagan Test for Heteroskedasticity** |  |
|---|---|---|---|
| F Value | 8.650 | Chi$^2$ | 3794.79 |
| Prob > F Value | 0.034 | Prob >0.019 Chi$^2$ |  |

The value of Chi$^2$ statistics autocorrelation test is 8.650 and the p-value<0.05. Therefore, it shows the presence of serial correlation. The value of Chi$^2$ of heteroskedasticity statistics is 3794.79 and the p-value<0.05. Therefore, it can be concluded that the panel data is suffering from these issues. The final step to perform regression is the selection of an appropriate method of

regression. Therefore, this study carries out the Hausman test to see whether the fixed effect (FE) or random effect method (RE) is appropriate for this panel data set. Findings of the Hausman test is given in Table 6. The value of $Chi^2$ statistics is 1279.47, and the p-value is not significant at the 5% level; the insignificant p-value shows that difference between the coefficients of the RE and FE models is not systematic. Therefore, the RE model is appropriate to conduct a regression analysis. Baesd on this finding, this study has adopted the RE mehod of regression for testing the hypotheses. In addition this study will use robust stand errors developed by the Eicker (1967) and Huber (1967) and to resolve the issue in the panel data set.

Table 6
*Hausman Specification Test for Random-Effects vs Fixed-Effects*

| Hausman Test | |
|---|---|
| $Chi^2$ | 1279.47 |
| Probability> $Chi^2$ | 0.127 |

### 4.3 Regression Results

Table 7 offered the empirical findings of regression analysis. The R2 is 16.74% and 18.97% for Model 1 and 2 respectively. The independent variable, SR1 explain 16.74% variation towards the dependent variable, MV, while independent variable, SR2 explains 18.97%. There is a difference between $R^2$ (2.23%) between the two models, this difference can be attributed to the fact that the proxy for SR in both models is different from each other. SR1 is based on a dichotomous variable, whereas, SR2 is based on a continuous variable. Additionally, due to the difference in the nature of dichotomous and continuous variables, the coefficients between the two models are not comparable.

Moreover, with respect to hypothesis 1, The results of the regression for Model 1 show the positive and significant association between SR1 and firm valuation (MV) ($\beta$=1.486, p<0.05), supporting H1. This result confirms the significance of SR for the market valuation as suggested by the Ohlson (1995) price model that other accounting information also influence the valuation of the firm. While the results for Model 2 also finds similar results, SR2 and firm valuation (MV) ($\beta$=1.510, p<0.05), supporting H2. These results are in line with the previous findings that SR is the source of competitive advantage that creates a strong positive image of the firms (Fatemi et al., 2018; García-Sánchez et al., 2016; Lee & Hwang, 2019; Loh & Nguyen, 2018; Semenova & Hassel, 2016). Consequently, the markets reward firms in terms of higher firm valuation (Cho et al., 2015; Jensen & Meckling, 1976; Loh et al., 2017).

As discussed in the literature, there are many theories that can explain the positive influence of SR on firm valuation. First, these results are in line with signaling and agency theory. The results infer that the firm which are offering SR will results in more enhance valuation and also the firms which are meeting high standards of SR will be rewarded more from the markets, which are offering less SR. Secondly, Agency theory support these findings through the explanation that, the firms which are offering SR will reduce the information asymmetry and conflict of interest Jensen and Meckling (1976) and in turn, the investors will value these firm high, On the other hand, SR is seen as a signaling device in the market, more SR will be considered as more positive and consequently the market will appreciate this issue and will result in high firm valuation (Loh et al., 2017). Finally, these results can be explained through legitimacy theory as well, because every firm wants to be legitimate in the market by providing high-quality SR to meet social need generally. Therefore, their efforts are seen positively and consequently, firm valuation is increased.

Table 7
*Relationship between SR and Firm Valuation*

**Dependent Variable MV**

| Variable | Coff. | Z value | P>Z | Coff. | Z value | P>Z |
|---|---|---|---|---|---|---|
| | **Model 1** | | | **Model 2** | | |
| SR | 1.486 | 2.240 | 0.025** | 1.510 | 2.450 | 0.031** |
| Commerce (COM) | 0.834 | 1.940 | 0.053*** | 0.817 | 1.900 | 0.058*** |
| Construction (CONS) | -0.138 | -0.820 | 0.412 | -0.134 | -0.790 | 0.432 |
| Finance (FIN) | -0.438 | -1.650 | 0.099*** | -0.448 | -1.680 | 0.092*** |
| Hotels (HOT) | -6.750 | -4.450 | 0.000* | -6.776 | -4.510 | 0.000* |
| Manufacturing (MFG) | -0.847 | -1.650 | 0.099*** | -0.845 | -1.650 | 0.099*** |
| Mining (MINQ) | 0.025 | 0.060 | 0.950 | 0.025 | 0.060 | 0.949 |
| Properties (PROP) | -0.437 | -3.250 | 0.001* | -0.439 | -3.270 | 0.001* |
| Services (SERV) | -0.690 | -1.750 | 0.080*** | -0.704 | -1.790 | 0.073*** |
| Transport (TSC) | -0.459 | -1.740 | 0.083*** | -0.467 | -1.770 | 0.078*** |
| Constant | -2.598 | -2.290 | 0.022 | -2.626 | -2.350 | 0.019 |
| $R^2$ | 16.74% | | | 18.97% | | |
| N | 1350 | | | 1350 | | |

*Significance level (0.01\*,0.05\*\*,0.10\*\*\*)*

MV = Share price of a firm, SR1 (Model 1) = A dichotomous variable, 1 for firms disclosing sustainability reports, otherwise 0, SR2 (Model 2) = SR Score

## 5. Conclusions

This study analyzed the association between SR and firm valuation by using a sample of mainboard firm quoted in Singapore. A comprehensive framework was utilized for the measurement of SR of companies by making use of global standards of SR i.e. GRI. The findings revealed a significantly positive association among relationship SR and firm valuation and better quality of SR is an assurance of better firm valuation. On the other hand, many of investigations have previously not established a well-defined association between SR and firm valuation. This study has done this by providing empirical evidence from a developed countries context. This investigation was an addition to the literature in three main areas including, investigation of SR issue in the context of Asia and additionally, the focus of the study was on Singapore because its environment is totally different from other developed countries.

Secondly, the study utilized worldwide acceptable and acknowledged standard to measure SR i.e. GRI. The outcomes of the study will support the better understanding the sustainability reporting among organizations, particularly with the certainty that the adoption of SR has implications for market values.

Thirdly, in Asia, the global authorities are trying to implement a regulatory framework for SR. As embodied in the challenges of introducing sustainability measures such as in the problems of resistance form the firms and lack of understanding on this issue and misconception of increasing cost without any benefits. Therefore, this evidence will be helpful to create awareness of SR in Asia, so it will become easier for the regulator to implement and enforce SR practices.

### 5.2 Practical Implications

This study has several practical aspects for the consideration of policymakers in Singapore. The finding revealed a significantly positive association between SR and firm valuation. The issue has significant implications for regulators interest. The regulators can create awareness based on this evidence that SR should not be considered as an irrelevant activity. The evidence shows that SR compliance improves firm's valuation. Therefore, policymakers should try to improve SR practices among the listed firm. This will help to improve communication between the firm and its stakeholders. Therefore, the confidence of stakeholders will be improved that will help in the efficient functioning of the capital market. Moreover, the firms will be able to get more capital from the capital market easily for their investments projects.

## 5.3 Limitations and Directions for Future Research

This study is having numerous limitations. First, this study is based on Singapore listed firms on the main market SSM and ignored the secondary market. Despite the fact that the secondary market is very small as compared to the main market, still, the public has invested in the secondary market. Thus, it leads to the issue of generalization of the findings to other markets in Singapore, as well as, to other developing countries due to the difference in the contextual environment. To overcome this limitation, the conceptual framework should be tested in other developed and developing countries with different regulatory environments. Additionally, the other measures of firm valuation should be considered such as Tobin Q. This study has considered the only control variable related to industry segments, futures researches should also consider this model with control variables to evaluate, whether these results are valid. The sample size of this study is based on 3 years, it is convincing that the effect of CSR takes time to incorporate in the firm values or return, therefore, future researches should take more data to asses this issue in detail.

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