

## RESEARCH PROPOSAL



### **Market reaction to the release of environmental, social and governance (ESG) news and sustainability reports in Mauritius.**

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## **1 Background of study**

In recent times, scholars, practitioners, and policymakers have engaged in a lively debate about the need for an urgent global transition towards sustainable development by creating new opportunities for boosting the “co-evolution of the environmental, social and governance (ESG) factors” (Giljum, 2005). It follows that the transition towards sustainable development entails a rapid reorientation and restructuring of national and international institutions towards stronger emphasis on environmental concerns, effective governance, and better social integration (Steffen et al., 2015; Lo and Kwan, 2017). According to the UNPRI (2015), the non-financial information – following the ESG factors – concerns, environment which relate to pollution, gas emissions, climate change, waste management, biodiversity loss, renewable energy and natural systems; society relates to human well-being, good working conditions and human rights; and, finally, governance focuses on board size, structure and independence, gender diversity, skills development, internal control, easy access to information, ethical codes, shareholder relations and engagement.

The question which has been debated vigorously, given the increasing influence of, and current research on, sustainable and responsible investing relates to what extent do financial markets foster and facilitate more sustainable business practices (Sciarelli et al., 2020). The concept of sustainable development within the business community have grown significantly and these developments are mirrored by practices of institutional investors and market participants. Their investment decision-making process are based on ESG information, which eventually influence the corporate behaviour through the market value and financial bottom line of the corporations (IFAC, 2012). As such, the growing international focus on corporate sustainability triggered firms to engage more into sustainable and ethical business practices and reporting, through the publication of sustainability reports (Zhang et al., 2018). The appetite of the market participants drove institutional investors to align their portfolios toward companies with better ESG performance. This signals a different approach from focusing on “responsible funds,” and instead seeing ESG issues as fundamental to the performance for all investments. Eventually, the increasing relevance and demand of sustainability led capital exchanges to the development of sustainability indices to facilitate the investments in socially responsible companies (Sustainable Stock Exchanges, 2019). The structure and demand of the financial and capital markets have changed over time, moving from the exclusive focus on profit maximisation and shareholders’ wealth to a growing attentiveness about environmental issues like the green and low-carbon economy and the climate change adaptation and mitigation, becoming fundamental in the cited transition toward sustainable development (Ryszawska, 2016).

However, the theoretical underpinnings on market reaction to the publication of ESG news and sustainability reports are debatable, for the market can react positively, negatively and indifferently. It is also not clear whether the market reaction differs for companies belonging to the sustainability index against companies listed in the market index.

From the efficient market hypothesis (EMH) proposed by Fama (1991), new information is absorbed by the market instantly and entirely and is fully reflected in the asset prices within at most a day or two. According to Galema et al. (2008), under EMH socially responsible stocks are on high demand compared to conventional stocks, which means that the markets may react more positively to the publication of ESG news and sustainability reports by companies belonging to sustainability indices. Also, Starks and Zhou (2019) found that ESG information may be related to shareholder value. The argument is that better sustainability performance can not only lead to better resources (Cochran and Wood 1984; Waddock and Graves 1994), higher-quality employees (Turban and Greening 1997), and marketing success (Moskowitz 1972; Fombrun and Shanley 1990), but also mitigate the likelihood of stock price crash risk (Kim, Li, and Li 2014; Starks and Zhou, 2019) and enhance firm reputation (Fombrun and Shanley 1990; Fombrun 2005; Freeman, Harrison, and Wicks 2007). The positive market reaction is also linked to legitimacy and stakeholder theories, which are useful to derive market reactions and expectations regarding the publications of ESG information (Fernando and Lawrence, 2014).

Another viewpoint suggests that there may be no reaction to ESG news. For instance, investors might only care about ESG because of reputational or nonpecuniary reasons (Jones, Jones, and Little 2000; Baker, Bergstresser, Serafeim, and Wurgler 2018). Under such circumstances, ESG information would be valued as irrelevant and therefore financially immaterial. There would also be no reaction if investors do not update their beliefs post ESG news because much is already known through already existing channels (Griffin and Sun, 2013). The no-effect hypothesis is closely related to the Modern Portfolio Theory (MPT) (Markowitz, 1952) and somehow incorporate the efficient market hypothesis. The theory argues that there is no return premium for factors that bear only idiosyncratic risk, that is, it is assumed that ESG risks can be diversified (Bauer et al., 2005). The efficient market hypothesis maintains that stock prices reflect all available and relevant information, which makes it impossible to achieve superior risk-adjusted returns relative to the market portfolio depending on the nature of the market (Bodie et al., 2018).

Nevertheless, Cheng, Hong and Shue (2013) is of the view that a firm's ESG efforts are mainly associated with agency costs, where in such a case, ESG would mainly enhance managers' reputation at the expense of shareholders. This would lead to a rise in a firm's costs which would also be a disadvantage in a competitive market (Friedman 1970; Jensen 2002). Under the agency

theory, sustainability performance is viewed as management incentives and activities that focus on short-term earnings targets which are normally linked to executive compensation and detract from achieving sustainable and long-term performance for stakeholders. According to Fama and Jensen (1983), there is information asymmetry, as only senior management typically knows the true representation of financial reports and company's information and decides to withhold relevant information from investors. Based on the limited information available, investors will undervalue well-performing corporations and overvalue poorly performing corporations, and thus the market will fail to optimally allocate resources (Rahman et al., 2020). This statement is supported by the findings of Kruger (2015), who found that the market reacts negatively during publication of positive ESG news.

The empirical evidence relating to the market reactions to the release of ESG news and sustainability reports and whether the reaction differs for companies belonging to a sustainable index is diverse. For example, findings of Flammer (2013) stated that the US market reacts positively to the announcement of eco-friendly initiatives, and Dimson, Karakas, and Li (2015) found positive abnormal returns to successful ESG engagements by investors in North America. Capelle-Blancard and Petit (2019) found negative market reaction to negative ESG news using news from Europe. Battacharya et al. (2017) reported significant short-term stock market reaction to the release of sustainability reports in US and concluded that firms that release sustainability reports enjoy higher value relevance of sustainability performance over the long-term. As such, sustainability reports enhance information transparency and allow investors to incorporate sustainability information in stock valuation. Empirical evidence relating to the differences in market reaction to the release of ESG news and sustainability reports by companies belonging to sustainability indices, that is, sustainable companies, against non-sustainable companies, which are companies not listed in sustainability indices, suggest that there is a difference. For example, Wu et al. (2015) found that UK FSTE4Good outperform, indicating that socially responsible indices are more resilient to economic turmoil and market shocks. According to Barnea and Rubin (2010), majority of socially responsible investing related studies have found a positive correlation between companies listed in sustainability indices and stock price performance.

### **1.1 Problem Statement/Justifications to Research Gap**

The discussion above suggests that there is need for further research on how the market reacts to the release of ESG news and sustainability reports, and whether the reaction differs between sustainability indices and non-sustainability indices companies for a number of reasons.

Firstly, based on the theoretical predictions and empirical findings, how markets react to the publication of ESG news and sustainability reports is still debatable. The findings are inconclusive as there is not much support for the theoretical frameworks, EMH, agency, stakeholder and legitimacy theories. Normally, markets react significantly towards firms that disclose more ESG information when a negative event occurs, because the occurrence of the negative event may contrast with investors' expectation (Hummel, 2020). For example, Capelle-Blancard and Petit (2019) reported a negative market reaction to negative ESG news using news from Europe. Krüger (2015) found mixed results in US, that is, the market reacts negatively during publication of positive ESG news. Similarly, Melinda and Wardhani (2020) found that, within Asian countries, ESG controversies contributed to a positive relationship with the company value. Guidry and Pattern (2010) found that investor reaction in US varies based on the quality of the report being issued, where firms with the highest quality reports exhibit significantly more positive market reactions than companies issuing lower quality reports. However, in Milan Stock Exchange and using a sample of 178 Italian companies, a negative correlation between firms' market value and social report publication was reported (Cardamone, Carnevale, and Giunta, 2012). Thus, whether and how the publication of ESG news and sustainability reports impact the market reaction remains an empirical question.

Secondly, there are limited and contradictory studies on how the market reaction to the release of ESG news and sustainability reports differ between companies listed in sustainability indices and non-sustainability indices. For instance, Lean and Pizzutilo (2020) found that both sustainable and conventional indices performed almost in the same way independently of the financial market conditions in North America (MSCI Sustainability Index), while results of Wu et al. (2015) supported the outperformance of the UK FSTE4Good, indicating that socially responsible indices are more resilient to economic turmoil and market shocks. Yue et al. (2020), found that sustainable funds are less risky than traditional funds, but no clear evidence was found to confirm that sustainable funds can generate higher returns compared to traditional peers. In Australia, Chandra and Rad (2021) found that listed companies with high ESG factors outperformed those formed on low-ESG factors, which eventually drives the significant investors' observed reaction to a firm's sustainability reports. Therefore, there is need to add more to empirical evidence to these limited but contradictory studies.

Finally, most of the studies to date are concentrated in developed countries with very few in developing countries and virtually none in Small Islands Developing States (SIDS). There is a plethora of studies undertaken in US (Flammer, 2013; Battacharya et al., 2017, Dimson, Karakas, and Li, 2015 and Mensi et al. 2017), UK (Wu et al., 2015), Europe (Yue et al., 2020; Del Mar

Miralles-Quiros et al. 2017; and Stolowy and Paugam, 2018) and Australia (Chandra and Rad., 2021) to investigate on the market reaction to the publication of ESG news, sustainability reports and assess whether companies listed in the sustainability indices outperform companies which are not. As such, the call for investigation is to shift focus in Small Islands Developing State, like Mauritius. According to Karlsson and Chakarova (2008) the level of impact of CSR activities on stock prices also varies geographically, for the differences in national and international cultures exhibit varying behavioural patterns (Amankwah and Abonge, 2011). Therefore, it will be interesting to find out how the market reacts to the publication of ESG news and sustainability reports and whether there is a different reaction for companies listed on The Stock Exchange of Mauritius Sustainability Index (SEMSI) compared to those which do not belong to the sustainability index.

## **1.2 Aim and Objectives of the research**

### ***1.2.1 Aims***

The aim of this study is to assess the market reaction to the publication of ESG news and sustainability reports on the Stock Exchange of Mauritius (SEM) from year 2012 to 2021. Further, the study also aims to find out if there is a difference in the market reaction to the publication of ESG news and sustainability reports by companies that belong to The Stock Exchange of Mauritius Sustainability Index (SEMSI) and other companies not belonging to the SEMSI.

### ***1.2.2 Research Objectives***

1. To determine the market reaction to the release of environmental, social and governance information.
2. To investigate the market reaction to the release of sustainability reports.
3. To examine whether the market reaction to the release of ESG news differs between companies listed in the Sustainability Index and companies not listed in the Sustainability Index.
4. To examine whether the market reaction to the release of sustainability reports differs between companies listed in the Sustainability Index and companies not listed in the Sustainability Index.

### ***1.2.3 Research Questions***

1. How does the market react to the release of E, S, G news in Mauritius?
2. What is the market reaction to the release of sustainability reports in Mauritius?
3. Does the market reaction to the release of E, S, G news differ between companies listed in the Sustainability Index and companies not listed in the Sustainability Index?

4. Does the market reaction to the release of sustainability reports differ between companies listed in the Sustainability Index and companies not listed in the Sustainability Index?

## **2 Literature Review**

### **2.1 Theoretical Review**

A number of theories such as efficient market hypothesis, signaling theory, agency theory, modern portfolio theory, stakeholder theory and legitimacy theory support the market reactions to the publications of both ESG news and sustainability reports.

#### ***2.1.1 Efficient Market Hypothesis***

According to the Fama (1976), efficient capital markets are "efficient in processing information", which means that stock prices observed in capital markets are based on "correct" assessments of all information available at a given moment in time. Thus, the Efficient Market Theory (EMH) posits that active investors will not be able to consistently outperform the market (Bodie et al., 2008). According to Fama (1970), in a market where the current price of a security "fully reflects" all available information, the following three conditions or assumptions are sufficient for markets to be efficient. Violations of any of the following three assumptions could be seen as a potential source for market inefficiency:

1. No transaction costs in trading securities
2. Asset markets are frictionless, and all information is costless and simultaneously available to all investors.
3. Investors are price-takers and have equivalent (homogenous) expectations on the implications of current information for the current price and distributions of future prices of securities.

However, these assumptions are extreme and non-existent in real-world capital markets (Fama, 1970). In the context of informationally efficient markets and EMH, the question whether ESG information is a "priced" risk factor matters to a great extent. To answer the question whether ESG is "priced" in stock markets, scholars tend to refer to the theoretical debate on demand differences (or tastes) for different types of stocks (Fama and French, 2007; Galema et al., 2008; Hamilton et al., 1993). For example, excess demand for socially responsible stocks and a shortage in demand for conventional stocks will overprice socially responsible stocks (Galema et al., 2008), which means that the markets may react more positively to the publication of ESG news and sustainability reports by companies belonging to sustainability indices.



To empirically analyse whether ESG information is "priced" by the market, Hamilton et al. (1993) suggest three alternative hypotheses (equal performance, underperformance, or overperformance) based on the risk-adjusted returns of socially responsible portfolios relative to conventional portfolios.

### ***2.1.2 Signaling Theory***

Signaling theory helps explain management incentives for achieving non-financial ESG dimensions of sustainability performance and investors' reaction to the disclosure of sustainability performance information (Grinblatt and Hwang, 1989). Signaling theory suggests that firms disclose "good news" through the use of various mandatory financial reports on their sustainability performance and voluntary reporting of non-financial ESG sustainability performance to differentiate themselves from less sustainable firms.

The signaling theory suggests that firms should promote their good sustainability stories and communicate effectively with all stakeholders to build branding and develop a good reputation for themselves. However, the expected link between a firm's voluntary non-financial sustainability performance reporting and the use of these signals is ambiguous. Healy and Palepu (2001) suggest that firms' voluntary reporting may act as a complement to signal information about expected future financial performance. Alternatively, these signaling mechanisms could be substitutes, suggesting a negative relationship between the probability of voluntary disclosures and the use of these signals (Grinblatt and Hwang, 1989). Signaling theory encourages business organisations to communicate with all stakeholders and send a uniform signal to achieve non-financial ESG dimensions of sustainability performance (Connelly et al., 2011; Dainelli et al., 2013). To sum up, signaling theory suggests that companies that disclose on environmental issues send a signal that they are engaged in proactive environmental strategy as they are incentivized to inform shareholders and other stakeholders by voluntarily disclosing more (Loh et al., 2017). Therefore, these positive signals make the companies more appealing to investors in the stock market.

### ***2.1.3 Agency Theory***

Agency theory focuses on risk sharing and agency problems between shareholders and management by suggesting that the interests of principals (owners) and their agents (executives) are often not aligned (Fama and Jensen, 1983). The implications of agency theory for sustainability performance are that management incentives and activities often focus on short-term earnings targets which are normally linked to executive compensation and detract from achieving sustainable and long-term performance for shareholders. Thus, firms should focus on creating shareholder value and leave the decisions about social responsibility to their

shareholders. There is information asymmetry, as only senior management typically knows the true representation of financial reports. Thus, to mitigate the perceived information asymmetry, management may choose to voluntarily disclose non-financial ESG performance information (Fama and Jensen, 1983). Based on the limited information available, investors will undervalue well-performing corporations and overvalue poorly performing corporations, and thus the market will fail to optimally allocate resources (Rahman et al., 2020). This statement is supported by the findings of Kruger (2015), who found that investors respond negatively to bad ESG news and have weakly negative reactions to good news. He also noted that the price reaction depends on whether investors perceive an event to be indicative of agency conflicts with management. Additionally, Ioannou and Serafeim (2015) showed that analysts' stock recommendations initially suggested a negative view of firms' ESG investments and reports, consistent with these activities being costly or a reflection of agency problems.

#### ***2.1.4 Modern Portfolio Theory***

The modern portfolio theory (MPT), developed by Markowitz, sets out a framework for creating a portfolio of assets from which the expected return is maximised for a given level of risk borne by the investor (Markowitz, 1952). The assumption to the theory is that investors need to be compensated for holding more risky assets, a portfolio's risk can be reduced through uncorrelated asset diversification and that markets are efficient. Traditional analytical interpretations of MPT do not account for sustainability and ESG. Previous research has shown that some investors (also called ethical or socially responsible investors) are willing to give up a portion of their financial returns for the increased utility provided by investments which align with their pro-social preferences (Webley, Lewis, and Mackenzie, 2000; Ariely, Bracha and Meier, 2009). Moreover, various research has highlighted better returns and reduced risk for socially responsible investments (Sudha, 2014; Fatemi, Glaum and Kaiser, 2018). Typically, sustainability considerations into MPT frameworks take the form of an exogenous constraint to the risk-return portfolio optimisation equation. Therefore, by virtue of MPT's assumptions, accounting for sustainable investments make them appear less 'optimal' on the efficient frontier.

Quigley (2010) showed that the stocks of companies with poor ESG policies and practices exhibit higher volatility. The author pointed out that the distribution of companies with poor ESG policies and commitment has a higher incidence of extreme negative outcomes and these stocks are considered riskier by portfolio theorists and average investors. According to International Monetary Fund (2019), the theory suggests that restricting the investment universe can reduce

diversification and therefore lead to underperformance. The International Monetary Fund analysis reflects that exclusionary screening increases volatility, but the overall performance of sustainable and conventional funds remains comparable. The findings contrast with Gasser, Rammerstorfer and Weinmayer (2017), which showed that investors choosing to maximise the social impact of their strategy face a statistically significant decrease in the expected return.

In general, and according to modern portfolio theory, investors only care about financial returns. If the stock price changes due to an ESG related event, this means that investors think that it influences expected future cash-flows. ESG information plays a role in investors' decisions. As such good ESG performance is not valued by investors, but bad ESG performance is interpreted as a risk. Jaworski (2007) finds that investors assign a higher risk premium in their valuation model to companies with ESG risks. On the other hand, companies with a good ESG record do not receive a risk discount. Henningsson (2008) also finds that investors see ESG as a reputation risk. Investors do not care, from a financial perspective, about ESG performance, if a company meets a certain minimum level.

### **2.1.5 Stakeholder Theory**

Stakeholder theory advocates that organisation should regard the interests of their stakeholders, who are "any group or individual who can affect or are affected by the achievement of the organisation's objectives" (Freeman, 1984), in their organisational decisions and target setting.

Two main variants of stakeholder theory have evolved over time: a normative and a managerial branch (Donaldson and Preston, 1995; Jamali et al., 2008). Within the normative branch, companies pursue their duty to account for their actions to all stakeholders that have a right to be informed about the implications of the companies' operations. Thus, there is an ethical standpoint (Deegan, 2013).

The second branch, the managerial stakeholder theory, takes an instrumental stance and argues that companies purposefully use voluntary reporting to control stakeholders, which are critical for the companies' subsistence and the provision of resources (Mitchell et al., 1997). As such, in the view of stakeholder theory, voluntary reporting is used to manage key stakeholders of the company (Fernando and Lawrence, 2014).

As such, in the view of stakeholder theory, voluntary reporting is used to manage key stakeholders of the company (Fernando and Lawrence, 2014). In the branch of the managerial stakeholder theory, studies are conducted to unveil the motives to disclose sustainability reports. For example,

Belal and Owen (2007) or Islam and Deegan (2008) explored how powerful stakeholder groups exercise pressure on companies about their social and environmental performance and thus affect the reporting practices of those companies. In both studies, the reports directly reflect the interests of powerful stakeholder groups. Belal and Owen (2007) asked for the perceived need of ESG information and the role of key stakeholders in the reporting process. First findings are that the general perception of most managers was positive regarding the disclosure of ESG information and that key stakeholders are those, depending on company specific circumstances, that possess economic power (e.g. shareholders or international buyers). Social or environmental groups or the wider society were merely mentioned. Thus, the main motivation for the provision of ESG information seems to be improving the corporate image and managing the interests of powerful stakeholder groups (Belal and Owen, 2007).

In a developed-country setting, Thorne et al. (2014) studied the decision and motivations to provide or not to provide sustainability reports. Larger companies were more likely to provide these reports. The author argues from a stakeholder theory perspective, that larger companies are more visible and have to react to a greater level of scrutiny by stakeholder groups. Both, reporters and non-reporters reveal that (missing) pressure from specific groups is an important factor for the actual (non-) disclosure of ESG reports.

Further, a main motivation for the reporting companies is to benefit through stakeholders and to show their social and environmental performance. The results indicate that companies react with their sustainability reporting to external scrutiny by stakeholder groups (Thorne et al., 2014). Similarly, Deegan and Blomquist (2006) identified pressure from powerful stakeholder groups as a factor in changing CSR strategies and reporting. Hence, the WWF as a large-scale NGO with great success in lobbying was identified as powerful stakeholder. The change in CSR reporting was perceived as a demonstration of environmental awareness and necessarily to receive the support of this key stakeholder to survive (Deegan and Blomquist, 2006).

Under the stance of the stakeholder theory, these studies agree that identified powerful stakeholders are able to put pressure on companies, which consequently affects the corporate (sustainability) reporting to contain mostly information of relevance for those groups.

### ***2.1.6 Legitimacy Theory***

Sustainability reporting is also often described by legitimacy theory, which seeks to explain disclosures of institutions or companies in its social and ecological environment (Hooghiemstra, 2000; Tilling, 2004). Legitimacy theory, which was built on a socio-political view, posits that firms should preserve their legitimacy by fulfilling their social and political contracts. Firms

should communicate valuable and relevant sustainability performance information and engage in non-financial ESG sustainability activities to obtain legitimacy and fulfill the ‘social contract’ (Guthrie and Parker, 1989; Tilling, 2004). In other words, the firms’ aim is to show a balance between the social, ecological and economic influences of its operations and the set of norms and values of society through sustainability reporting. Non-compliance with social norms and environmental requirements threatens organisational legitimacy and financial sustainability (Neu et al., 1998; Melloni et al., 2017). Hence, in contrast to stakeholder theory, legitimacy theory expects voluntary reporting to address the broad public in contrast to some selected groups only.

Hahn and Lülfs (2014) assessed the reporting behaviour of companies regarding negative aspects in voluntary sustainability reporting. They found in a sample (19 Dow Jones listed and 21 DAX listed companies) six different legitimisation strategies (symbolic and substantial) for the communication of negative aspects whereby most of the identified strategies (e.g. marginalizations or abstractions) are manipulations of the presentation of information to reach the change in perceptions of the reader (Hahn and Lülfs, 2014). Waniak-Michalak et al. (2018) observe a lack of explanation of the reasons for changes made in ESG measures, which they link to attempts of retaining legitimacy.

While challenging the question why for-profit companies to invest resources in voluntary reporting, scholars give, at least, two disparate answers. From a legitimacy theory perspective, companies use voluntary reporting as a tool for justifying their activities towards the public with respect to their license to operate (Deegan, 2014). Taking the stance of stakeholder theory, this view is questioned by highlighting those reports might not necessarily be tailored to all, but to selected individual interest groups. Accordingly, they are a means to give account to the company’s stakeholders “sometimes based on the extent of the stakeholders’ power” (Fernando and Lawrence, 2014). Therefore, a rich body of literature on legitimacy and stakeholder theory is useful to derive market reactions and expectations regarding the publications of ESG information.

## **2.2 Prior literature and hypotheses**

### ***2.2.1 Market reaction to ESG news***

From the efficient market hypothesis proposed by Fama (1991), new information is absorbed by the market instantly and entirely and is fully reflected in the asset prices within at most a day or two. According to Galema and al (2008), under EMH, socially responsible stocks are on high demand compared to conventional stocks, which means that the markets may react more positively to the publication of ESG news and sustainability reports by companies belonging to sustainability indices. The positive market reaction is also linked to legitimacy and stakeholder

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Thirdly, Cheng, Hong and Shue (2013) is of the view that a firm's ESG efforts are mainly associated with agency costs, where in such a case, ESG would mainly enhance managers' reputation at the expense of shareholders. This would lead to a rise in a firm's costs which would also be a disadvantage in a competitive market (Friedman,1970; Jensen 2002). Under the agency theory, sustainability performance is viewed as management incentives and activities that focus on short-term earnings targets which are normally linked to executive compensation and detract from achieving sustainable and long-term performance for stakeholders. According to Fama and Jensen (1983), there is information asymmetry, as only senior management typically knows the true representation of financial reports and company's information and decides to withhold relevant information from investors. Based on the limited information available, investors will undervalue well-performing corporations and overvalue poorly performing corporations, and thus the market will fail to optimally allocate resources (Rahman et al., 2020). This statement is supported by the findings of Kruger (2015), who found that the market reacts negatively during publication of positive ESG news.

#### ***2.2.1.1 Market reaction to environmental news***

Companies committing to carrying out environmental responsibilities and disclosing information to the public will be valued more highly by market participants, which is reflected by the rise in their stock prices (González-González,2016). Environmental disclosure is a tool which helps investors assess future financial prediction and reduction in cost of capital (Clarkson et al, 2013). High level of disclosure enhances market liquidity, consequently reducing the cost of capital through a reduction of transaction cost and an increase in the company's securities demand (Botosan and Plumlee, 2002).

Johnston et al. (2008) has conducted research, among 71 US companies during 1995–2000, on the value relevance of greenhouse gases information (GHG). GHG information is measured by SO<sub>2</sub> gas emission. Information on SO<sub>2</sub> gas emission allowances affects the increase in the companies' stock prices. According to Johnston et al. (2008), investors considered information on SO<sub>2</sub> gas emission as a corporate strategy for managing companies' risks associated with GHG gas emissions. They concluded that SO<sub>2</sub> gas emission information had information content and was considered informative by market participants. Neglecting environmental aspects can be a negative signal for investors on companies' performances and can lead to financial losses. Disclosure of environmental aspects, such as greenhouse gas emissions, waste installations and the use of renewable energy, has proven to be able to increase companies' superiority (Cormier and Magnan, 2013; Fatemi et al, 2018).

Hamilton (1995), Karpoff et al. (2005) and Griffin and Sun (2013) examined studies on pollution and violations of environmental regulations. Using the event study methodology with event window of 0 to 1 day in New York, Hamilton (1995) demonstrated that the publication of toxicological performance indicators by the US Environmental Protection Agency leads to a statistically significant negative abnormal return on the day of disclosure. Karpoff et al. (2005) studied the stock market effects of Wall Street press announcements of environmental violations. Based on their study, they claim that news about an environmental violation is costly to firms, and the stock value losses are similar regardless of the type of the environmental harm. They found that the initial press announcement caused a significant stock price reaction: an average two-day abnormal return of -1.69%. The amount of losses is of a similar magnitude to the legally imposed sanctions. Griffin and Sun (2013) explored voluntary publications through the news portal CSRwire, a leading source of CSR information and found that the publication of news with content about greenhouse gas emissions led to a positive abnormal return for shareholders.

Disclosure of new information will be responded with various forms of responses. If the information has content, the reaction of investors can be examined through the rise of share prices. Based on the previous literature and empirical research, the following research hypothesis is proposed:

**Hypothesis 1:** *There is a significant market reaction to the release of environmental information.*

### ***2.2.1.2 Market reaction to social news***

Social information describes a company's achievements on social aspects within a certain period of time. Social aspects such as employee welfare, customer satisfaction, work accident rates, and customer complaint levels are other indicators besides financial indicators that can be sensitive information for stakeholders. Companies have a responsibility in the social and environmental aspects. Good corporate social performance can be reacted as a positive signal by investors because it is related to the long-term sustainability of the companies' operations and can increase investors' awareness of the importance in considering social factors as an indication of potential risks in the future (Zuraida et al, 2016). Therefore, market participants are expected to give higher values on companies which disclose information more highly on social aspects.

Qiu et al. (2016) have conducted research on the value relevance of environmental and social disclosure in the UK. The study used 629 observations during year 2005-2009. Using regression analysis, they found that only social disclosure had value relevance and mattered to investors. Environmental disclosure has no significant effect on market value. Higher market value earned by companies that disclose social information highly is driven by greater prediction of growth rate in their future cash flow (Qiu et al., 2016). The importance of social aspects as a signal of potential future risk and return among investors has raised attention on the disclosure of social information (Zuraida et al, 2016). Using an event study of 178 negative legal/regulatory actions against 99 Wall Street firms throughout the 11 years from 1993–2003, Godfrey et al. (2009) confirmed that companies dealing with socially responsible investments incur fewer losses of market capitalisation compared to companies that do not. Krüger (2015) concluded that negative events lead to strong negative abnormal such that the news with an increased content of legal and economic information leads to stronger reactions of stock prices. The researcher identified 2,116 precisely dated positive (574) and negative (1,542) ESG events between 2001 and 2007 for 745 US companies and used two set of time window +5, -5 days and +10, -10 days to investigate the market reactions to ESG news.

The connection between layoffs and stock prices has been studied by Chen et al. (2001), where they studied the stock market and earnings performance as well as operating performance (measured by profit margins and labour productivity) before and after layoff announcements published in Wall Street Journal 1990-1995. They found that layoffs are preceded by a period of poor stock and operating performance and followed by improvements in both. Also, they found that layoff announcements are followed by a significantly negative stock market reaction of, on average, -1.2% (two-day abnormal return).



An international comparison is offered by Carnevale et al. (2012), who found no significant correlation between stock prices and social reporting within a sample of European listed banks in the period 2002 to 2008. However, their results change by moving to a cross-country analysis. Although, in some countries, social reporting produces a significant positive influence on stock prices, in other countries, this influence remains significant but negative. Based on the previous literature and empirical research, following research hypothesis is proposed:

**Hypothesis 2:** *There is a significant market reaction to the release of social information.*

### **2.2.1.3 Market reaction to governance news**

From the beginning of the twenty-first century, corporate scandals, such as those of Enron and WorldCom, as well as the sub-prime mortgage crisis and the following credit crunch, have shaken confidence in large organisations and prompted the call for greater Corporate Social Responsibility (CSR). Stakeholders not only demand transparency regarding financial activities in the annual report, but also greater corporate accountability with reference to social and environmental issues and performance (Mahmood et al., 2018; Rezaee and Tuo, 2017). Information about good governance structures is a positive signal for investors. These benefits include enhanced corporate image and relations with stakeholders; better recruitment and retention of employees; improved internal decision making and cost savings; and increased financial returns (Riadh et al., 2018). Investors believe that the company can prevent potential fraudulent behaviours and maintain shareholders' value. Disclosure of governance information helps ensure investors that corporate social responsibility activities are running well. Disclosure of corporate governance information is indicated to be able to attract more investors (Khan et al., 2013; Liu and Zhang, 2016).

Previous studies have examined the effect of corporate governance in improving companies' financial performances. Governance information is considered to have a positive impact on firm value (Khan et al., 2013; Beltratti, 2005). Using 41 publicly listed Australian companies over 1983–2003, Gibson and O'Donovan (2007) mention that "good governance is now closely linked to the concept of CSR and accountability and that one way to demonstrate CSR is to increase annual report disclosures". According to the existing literature, several characteristics of a board of directors that influence the effectiveness of corporate governance, and the quantity and quality of CSR disclosure can be identified: board independence and size, CEO duality, and the diversity of the board of directors (Adams and Mehran, 2003; Chan et al., 2014). Additionally, when it comes to gender diversity within the board, according to Boulouta (2013) and Harjoto et al. (2015), boards with female directors are more likely to invest in CSR.

Zahra and Pearce (1989) argue that one of the major roles of directors is to advance the firm's reputation. As such, firms can enhance their reputation and ultimately their legitimacy by appointing important or powerful individuals to their boards. Consequently, Aguilera (2006) argue that corporate governance mechanisms can be seen as a set of accountability measures that increase the level of legitimacy. According to Hillman et al. (2007), the appointment of women on corporate boards adds legitimacy to an organisation by sending a positive message to current female employees and potential recruits, as well as to the stakeholders and the market, that the firm will comply with society's expectations.

These studies indicate that independent boards of directors and larger boards help facilitate both shareholders' and other stakeholders' interests (Chan et al., 2014). From an agency theory viewpoint, powerful CEOs tend to provide a higher degree of CSR disclosure to maintain their private reputation and deal with risk management (Jizi et al., 2014). Board gender diversity has also received increased attention in recent years in relation to corporate governance and CSR disclosure.

Empirical evidence has proven that effective corporate governance can increase corporate investors' confidence. Publication of governance information is expected to be responded positively by investors, which can be observed through an increase in stock prices. Based on the argument, hypothesis three is proposed as follows:

**Hypothesis 3:** *There is a significant market reaction to the release of governance information.*

### **2.2.2 Market reactions to sustainability reports**

The prevalent way to disseminate the ESG information to the stakeholders is to report them along with the other standalone reports such as corporate social responsibility, sustainability, or governance reports (Bassen and Kovacs 2008; Navi 2014). Sustainable development reports are defined as tools of stakeholder communication, including companies' economic, social and governance performance, providing a more comprehensive picture of the non-financial aspects of firms' managerial practices. The release of ESG information helps companies ensure investors that the company has made a commitment to improving its operations (Fatemi et al., 2018). Therefore, the publication of ESG reports is a positive signal for investors.

At the same time as firms are taking the lead by either voluntarily or mandatorily publishing information about their sustainable development initiatives and achievements in their annual reports, on their websites or in separate reports, several national and international organizations have developed frameworks to provide them with guidance on disclosing information and preparing such reports (Adams and Narayanan, 2007). Yet, the adaptability of the frameworks

around the international platform is still debatable. Perez and Sanchez (2009) observed that the content of sustainability reports differed significantly from one firm to another; while Ho and Taylor (2007) and KPMG (2008) indicated that the reports vary from one country to another.

Clarkson et al. (2008) examined the link between the environmental information contained in sustainability reports and the environmental performance of companies proxied by two measures of the Toxics Release Inventory (TRI) of the US Environmental Protection Agency's (EPA). Their results show a positive relationship. Schadewitz and Niskala (2010) note that Global Reporting Initiative (GRI) based reports issued by Finnish firms are valued by the market. Berthelot et al. (2012) reported that investors, through the Canadian companies listed on the Toronto Stock Exchange, positively value this type of reporting. These findings support the relevance of initiatives like the Global Reporting Initiative, the UN Global Compact, and that launched by the International Organization for Standardization (ISO), which focus on the development of recognized guidelines for sustainability reporting. Aureli et al. (2020) considered 170 report disclosures from 55 listed companies on the DJSI World during the period from 2009 to 2016 to analyze the impact of the report publications on the security returns. The event study methodology was employed, using 33 different event windows. The authors found two significant event windows and an increasing level of significance in the reports released after 2013. Similar finding is provided by (Zuraida et al, 2016; Auer and Schuhmacher, 2016; Benlemlih and Bitar, 2018).

Brown et al. (2010) have investigated whether the first-time issuance of a standalone sustainability report led to changes in reputation as measured by Fortune Most Admired scores. Their results show no significant changes in reputational factors. In fact, their findings suggest that only the highest quality sustainability reports appear to positively enhance corporate reputations. The results of a Danastas and Gadenne survey (2006) of Australian social and environmental non-governmental organizations (NGOs) suggest that the NGO perception of social disclosure is relatively homogeneous. They view some information as relevant but consider the disclosures to be insufficient overall.

Moneva and Cuellar (2009) and Murray et al. (2006) examined investors' integration of the ESG information disclosed in annual reports. Moneva and Cuellar (2009) found that investors take financial rather than non-financial information into account. Murray et al. (2006) found no significant relationship between a company's stock price performance and its disclosure of social and environmental information. The findings of a study by Magness (2009) show that while investors do take environmental information into account, the extent to which they do so remains to be determined. Guidry and Patten (2010) found no significant market reaction to the announcement of the first release of a sustainability report. However, in dividing their sample

according to the quality of these reports, their results show that companies with the highest quality reports elicited significantly more positive market reactions than those issuing lower quality reports. Cui and Docherty (2020) examine stock returns around ESG news announcements by using the event study methodology and calculate the cumulative abnormal return (CAR) to 21 trading days around for each news release. They found evidence that the market overreacts to ESG news; this could have some adverse implications in terms of market efficiency and investors behavior. Based on literature reviews and empirical evidence, the publication of sustainability is expected to have a positive impact on share price performance. Therefore, the fourth hypothesis is proposed as follows:

**Hypothesis 4:** *There is a significant market reaction to the publication of sustainability reports.*

### ***2.2.3 ESG news and Sustainability indices***

Ortas and Moneva (2011) studied market reaction to the announcement of variations in the DJSI Stoxx composition and the release to the market of the new sustainable equity index, using an event study throughout 2003–2007. They found that the companies' inclusions or exclusions are not associated significantly with their stock prices. Curran and Moran (2006) investigated the effect on price of inclusion in and deletion from the FTSE4 GoodIndex and found that although there is a trend towards positive and negative announcements having the expected impact on daily returns, these movements are not significant and do not suggest that a company's inclusion in the index produces any substantial financial gain.

Using the Morningstar SRI Index from 2003 to 2010, Nakai et al. (2013) investigated how investors evaluate membership of a sustainability index; they found that while inclusion in the index positively affects share price, exclusion from the index does not have a significant effect. Miralles-Quirós (2019), Khan et. al (2013) and Dimson, Karakas, and Li (2015) studied how investors perceive firms ESG attitude and how they incorporate this factor in their investment decision, influencing financial performance and stock prices. There is evidence that companies fulfilling sustainability requirements have better market performance even though ESG factors may impact differently according to specific businesses and sectors (Khan et al., 2013).

Friede et al. (2015) highlighted that the ESG index effect on share price performance vary among asset classes and countries, showing that in emerging markets, ESG strategies outperform other investment opportunities. Giese and Nagy (2018) highlighted that stock markets react more sensitively to ESG information for companies that do not have extreme ESG scores, i.e., neither very low nor very high, and that stock markets show a stronger reaction to improvements in ESG, rather than to drops in ESG performance. Recent studies of La Torre et al. (2020) used the panel

data analysis with a sample of 45 listed firms on Eurostoxx50 during 2010–2018 to investigate how ESG components affect stock returns. They found that companies with high ESG commitment have higher returns and lower volatility, this being supported by the assumption that ESG factors are considered, by market agents, as a good proxy for firms' financial soundness. Based on the above, the following research hypotheses are proposed:

**Hypothesis 5:** *There is a significant difference in the market reaction to the publication of environmental news by companies that belong to a sustainability index and companies that do not belong to the sustainability index.*

**Hypothesis 6:** *There is a significant difference in the market reaction to the publication of social news by companies that belong to a sustainability index and companies that do not belong to the sustainability index.*

**Hypothesis 7:** *There is a significant difference in the market reaction to the publication of governance news by companies that belong to a sustainability index and companies that do not belong to the sustainability index.*

#### **2.2.4 Sustainability reports and Sustainability indices**

In recent years, companies increasingly have been declaring themselves sustainable and releasing sustainability reports along with their annual reports (Yilmaz et al., 2020). To the extent that shareholders interpret such benefits as leading to increased long-term value for the firm, the initiation of sustainability reporting would be expected to lead to positive market reactions.

In a survey data consisting of 280 Dubai companies, Rettab et al. (2009) analysed the connection between social responsibility and organisational performance. The results indicate a positive linkage between survey-based social responsibility index and a financial index consisting of four accounting-related indicators. De Klerk and De Villiers (2012) used KPMG database to assess the level of the companies' corporate responsibility reporting and showed that it is positively correlated with market value of South African listed firms.

Moneva and Cuellar (2009) explored the relationship between a firm's market value and environmental reporting, using different types of financial and non-financial environmental information disclosed in the annual report. Their study examined a sample of listed Spanish companies. The results suggest a significant market valuation of financial environmental disclosures (investments, costs, and contingencies), but not of non-financial disclosures. Also, by

comparing stock returns of BIST SI and BIST 100 indexes, Altın and Yazan (2016) demonstrated that there is no statistically significant difference between stock performances of Borsa Istanbul Sustainability Index (BIST SI) and BIST 100. In a similar manner, Citak et al. (2018) found no difference between the stock returns of the firms indexed and those of non-indexed in BIST SI.

Cardamone et al. (2011) examine the value relevance of sustainability reports on a sample of 178 Italian companies listed on the Milan Stock Exchange from 2002 to 2008. In the research model, the market value is a function of the book value, earnings, and the sustainability reports. Their findings show a significant negative correlation between the firm's market value and sustainability reports publication. Furthermore, comparing companies that publish sustainability reports and companies that do not publish sustainability reports, the authors conclude that the book value per share accounting information is more relevant for the companies that publish sustainability reports, whereas the value relevance of earnings per share and share price do not change for these companies.

Both Ingram's (1978) and Anderson and Frankle's (1980) studies yielded mixed results. Ingram (1978) finds no significant results for his overall sample but does report some positive valuation effects for selected subsets of disclosures. Anderson and Frankle (1980) indicate that firms publishing sustainability reports significantly outperform non-disclosing counterparts in the market, but primarily only for the month preceding annual report releases.

Limited studies were carried out on how market reactions may, upon publication of sustainability reports, differ between companies listed in sustainability index and companies which are not. As such this study will potentially contribute to the existing literature. Based on the previous literature and empirical research, the following research hypothesis is proposed:

**Hypothesis 8:** *There is a significant difference in the market reaction to the publication of sustainability reports by companies that belong to a sustainability index and companies that do not belong to the sustainability index.*

### **3 Methodology**

This section sets out the methodological approach to achieve the research objectives of the study. A quantitative approach will be applied, using secondary data extracted from The Stock Exchange of Mauritius (SEM), annual and sustainability reports, over the 10 years period of study ranging from year 2012 to 2021.

### 3.1 Institutional Aspects of SEM

The Stock Exchange of Mauritius (SEM) was incorporated on 30<sup>th</sup> March 1989 under the Stock Exchange Act 1988 and is positioned as one of the leading Exchanges in Africa, with both local and international investors. SEM is a signatory and Partner Exchange of the United Nation’s Sustainable Stock Exchanges (SSE) initiative. Trading take place on two core listing markets – Official Market (OM) and Development and Enterprise Market (DEM).

Listing Market	Number of listed companies
OM	38
DEM	38
<b>Total</b>	<b>76</b>

The Exchange has classified the listed companies into 8 industries namely: banking, insurance and other finance, commerce, industry, investments, leisure and hotels, property development, sugar and transport.

#### 3.1.1 The SEM Sustainability Index (SEMSI)

To promote sustainability, good governance and transparent business practices, the Stock Exchange of Mauritius (SEM) launched in September 2015 the Stock Exchange of Mauritius Sustainability Index (SEMSI). The SEMSI tracks the price-performance of those companies listed on the Official Market or the Development & Enterprise Market of SEM which demonstrate strong sustainability practices.

SEMSI provides a robust measure of listed companies against a set of internationally aligned and locally relevant ESG criteria. It offers a useful tool for domestic and international investors with an appetite for responsible investment in frontier markets.

By setting up SEMSI, the SEM has taken a leading role in creating a more sustainable capital market. This forward-thinking initiative makes SEM the second Exchange in sub-Saharan Africa to promote sustainability through a Sustainability Index (The Stock Exchange of Mauritius, 2021).

### 3.2 Sample Size

The study sample will include stocks listed on the SEM, both on trading platforms OM and DEM. The listed companies will be categorised into two groups of study over the period of 2012–2021. The first group constitutes of companies which demonstrate strong sustainability practices and are listed on the SEMSI (hereinafter, called sustainable companies) while the second group of companies do not figure in the sustainability index as they do not, supposedly, demonstrate

strong sustainability practices (hereinafter, called non-sustainable companies or conventional companies).

The dataset comprises of the 76 companies, categorised as 15 sustainable companies (13 from OM and 2 from DEM) and 61 non-sustainable companies. Studies conducted by Chelawat and Trivedi (2016) and Arya and Zhang (2009) in India and South Africa respectively support the sample size of the study.

### **3.3 Data Identification**

To achieve its research objectives, market-based measures will be employed to investigate the impact of ESG news and sustainability reports on the share price movements of the listed companies.

#### **3.3.1 Dependent variable**

The dependent variable is the change in market reaction or shareholder value, as represented by stock price, surrounding the release of a positive or negative event. The event date for the release of ESG news and publication of sustainability reports will be captured over the defined event window. Change in market reaction (the dependent variable) is the unexpected percentage change in the stock price surrounding the event, or the abnormal return. Stock prices change daily, due to market conditions as well as firm specific events.

In an event study, the dependent variable is generally the cumulative abnormal return (CAR) within a specific event window.

The daily closing share prices of both sustainable and non-sustainable companies listed on the OM and DEM from 2012 to 2021 will be used.

##### **3.3.1.1 Computation of daily returns**

The daily returns for stock prices will be calculated as the logarithmic change in the value of the stock compared with the previous day's closing value according to the following formula:

$$R_{i,t} = \log (P_{i,t}/P_{i,t-1})$$

$R_{i,t}$  = The return on the stock  $i$  at date  $t$ ,

$P_{i,t}$  and  $P_{i,t-1}$  = The daily closing prices of stock  $i$  at dates  $t$  and  $t-1$ , respectively

Logging helps to reduce the effect of any skewness in the return distribution and also filters out the fundamental issue of interest more clearly for examination, which in this case is the fluctuation of returns.



### **3.3.2 Independent variable**

The independent variables of interest are the ESG scores for positive and negative news on the announcement day of the release of the ESG news and sustainability reports. There are no formal ESG ratings index or guidelines used in Mauritius (Lexology, 2020). As such, the study will follow the guidelines of Jiang, Liu and Stark (2019) and Chiu, Chen and Hu (2020) in formalising an ESG ratings index. The study will design an ESG ratings index based on the release of E, S, G news, classified between positive and negative news, in Mauritius over the period of study.

The calculation method of ESG represents the firm's ranking of ESG performance. The release of sustainability report and a positive E, S or G news will equal to 1 and 0 otherwise. The higher the ESG score, the better the ESG performance.

The ESG rating index measures a company's performance on ESG issues, based on reported data in the public domain, covering sources of the data from the annual reports, company websites, stock exchange filings, sustainability reports, and other media sources (Jiang, Liu and Stark (2019). The ESG news for the listed companies will be segregated into Environmental, Social and Governance news, as per Table 1 below. Each segregated news will further be classified as positive or negative news upon release by the listed companies.

### **3.3.3 Market Indices**

As proxy for market returns, the sustainability index SEMSI will be used to capture the sustainability performance for sustainable companies, and SEMDEX (main index for OM) and DEMEX (main index for DEM) returns will capture for the performance of conventional companies respectively.

The use of market and sector indices controls for economy- and industry-wide events, and thus makes it easier to define price variation due to ESG events (Sini Länsilahti, 2012).

### **3.3.4 Segregation of ESG News**

The ESG announcements will be categorised as per Table 1 for both sustainable and non-sustainable companies over the period of study.

*Table 1: Segregation of ESG news*

Category	Topics	Key Terms
Environment	Climate change	Sustainability report Release of carbon
	Natural resources	Use of resources Environmental destruction Environmental protection
	Environmental pollution	Discharge of dangerous substances Waste management
	Ecological opportunities	Driving the energy transition Use of ecological opportunities Building environmentally friendly infrastructure
Society	Human capital	Innovation Increase human capital
	Labor force	Appreciation of the employees Establishing jobs
	Product liability	Responsible investment
	Social opportunities	Charitable activities Building infrastructure for society Development of society
Governance	Corporate management	Rating based on ESG Fulfillment of laws
	Company's behavior	Business ethics Quality of relationships with stakeholders Strengthening trust/peace Charges/arguments/convictions Corruption

*(MSCI ESG Research, 2015)*

### 3.3.5 Access to data

The historical daily share prices and the release dates of ESG announcements and sustainability reports will be obtained from Bloomberg Terminal, and both from the SEM's and companies' websites. Additionally, SEM Market Data Service provides timely market data packages, including share prices of the constituents, upon payment of a service fee.

## 3.4 Research Design

### 3.4.1 Event Study Methodology

This study will employ an event study methodology to analyse market reactions to ESG news and sustainability reports. This method allows assessing the financial impact of a specific event by determining whether there is an 'abnormal' stock price effect associated with an unanticipated event (McWilliams and Siegel, 1997). The event study method allows measuring the effect of an unanticipated event on stock prices and is based on estimating a market model for each company and then calculating abnormal returns, which are assumed to reflect the stock market's reaction to the arrival of new information. Previous studies of Buhlmann and Hisano (2019), Van Stekelenburg et al. (2015) and Consolandi et al. (2009) used this methodological approach.

Event studies utilise efficient markets hypothesis (EMH) assumptions, the notion that the stock prices adjust to reflect new information (Peterson, 1989) about a firm and its prospects is well accepted even by critics of the EMH such as Shleifer (2000), who notes that the basic assumptions guiding event studies produce robust results, and that these studies have significantly enhanced understanding of stock market reactions to events.

### 3.4.1.1 Steps to event study methodology

Well-established methodological rules exist for event studies (Peterson, 1989). The procedures for event studies are straightforward.

1. Identify the event of interest, and its timing
2. Control for other announcements or events that may cause investors to alter their valuations of the firm in addition to the focal event of interest
3. Predict the stock return in the absence of the event of interest
4. Observe how the actual return differed from the predicted return
5. Use regression analysis to test whether or not the variables of interest are related to the changes in stock price

Following the methodological approach of Aureli et al. (2020), the estimated returns of the selected companies over the event windows have to be calculated using a market model, which allows to obtain the abnormal return, the return actually obtained on a given day and the expected return according to a market model previously estimated. The rate of return of the stock is adjusted by subtracting the expected return from the actual return, and any significant difference is considered an abnormal return (AR). For firm  $i$ , event date  $\tau$ , and the conditioning information  $X_{\tau}$ :

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau} | X_{\tau}).$$

As applied by Krüger (2015), the study will use a two different time window ranging from five and ten trading days before the event, indicated by  $(-5, -10)$ , to five and ten trading days thereafter indicated by  $(+5, +10)$  from the ESG announcement and publication of sustainability report. The time range intends to capture the market reactions to ESG announcements and sustainability report over a relatively longer event window  $(-10, +10)$  and a shorter window immediately around the announcement  $(-5, +5)$ , benchmarked against the market and sustainability indices. AR will be calculated over the event window around the event date.

The expected returns will be calculated using the market model, a simple linear regression model assuming that the return on a generic  $i$ th security at time  $T$  ( $R_{it}$ , explained variable) depends on the return of the market portfolio at the same time ( $R_{mt}$ , explanatory variable). In simpler words, the daily stock returns are used to run an Ordinary Least Square (OLS) regression on the returns of a stock market index to estimate the model parameters  $\alpha_i$  and  $\beta_i$ :

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$R_{i,t}$  = rate of return, company  $i$ , day  $t$ ,

$R_{m,t}$  = rate of return, stock market index  $m$ , day  $t$ ,

$\alpha_i, \beta_i$  = regression coefficients, company  $i$ , and

$\tilde{\epsilon}_{i,t}$  = error term, company  $i$ , day  $t$ .

Using data for  $R_{it}$  and  $R_{mt}$ , the coefficients can be estimated, and the regression line can be written:

$$R_{it} = \alpha_i + \beta_i R_{mt}$$

For which,

$$AR_{it} = R_{it} - E(R_{it} | X_t) = R_{it} - \alpha_i - \beta_i R_{mt}$$

Abnormal returns can be aggregated through time, obtaining cumulative abnormal returns (CARs) referring to the selected event window.

In a study conducted by MacKinlay in 1997, CARs were averaged over the different event windows to include possible reactions in the share prices before and after the event, since the periods prior to and after the event may also be of interest. To be emphasized, the variable length of the event window will allow for better control in cases of possible leaks or rumours that could advance the reaction of the market at the date of the announcement, or the publication on a day when the market is closed (McWilliams and Siegel, 1997). Therefore, the distributional parameters of the CARs are as follow:

$$CAR_i(\tau_1, \tau_2) \sim N(0, (\tau_2 - \tau_1 + 1)\sigma_{\epsilon_i}^2)$$

Finally, the average CARs can be considered.

$$\overline{CARs}(\tau_1, \tau_2) = \frac{1}{N} \sum_{i=1}^N CAR_i(\tau_1, \tau_2)$$

The distributional parameters for CARs allow to test the evidence against the null hypothesis that the given event has no impact on the behaviour of the security returns. Therefore, if the CAR is significant, it will measure the average effect of the event on the value of the companies.

Thus, the primary dependent variable is the cumulative abnormal return, the cumulative abnormal stock return (as a percentage) accruing over the defined event window.

To compare for the market reaction to ESG news and sustainability reports among sustainable and non-sustainable listed companies, the study will also employ the paired-sample T-Test and Wilcoxon rank-sum, which will allow to test the statistical differences in the CARs produced in each type of listed companies.

### 3.4.2 Regression Analysis

The OLS regression using the abnormal return in the windows [-5, +5] and [-10, +10] will be undertaken to determine if significant differences exist in the market reaction to ESG news and publication of sustainability reports among sustainable and non-sustainable companies, as follows:

$$MA\ Return_{i,t} = \beta_0 + \beta_1 Negative\ News_{i,t} + \beta_2 Positive\ News_{i,t} + Date\ FE + Industry\ FE + Company\ FE$$

Where;

*MA Return* = Cumulative firm stock returns event window

$\beta_1$  *Negative News* and  $\beta_2$  *Positive News* = Independent variables of interest are the positive news and negative news

*Date FE* (Fixed Effect) = Announcement Day

*Industry FE* (Fixed Effect) and *Company FE* (Fixed Effect) = Type of industry and listed company releasing the ESG news and sustainability reports.

The White correction will be used to control for the heteroscedasticity that usually appears in cross-section analyses. The statistical software STATA 17 will be used to test for the research hypotheses.

### 3.5 Potential contribution of the study

The existing literature pertaining to market reactions on release of ESG news and sustainability reports focused mainly in developed and developing countries (Rahman et al., 2021; Starks and Zhou, 2019). Even the theoretical frameworks were investigated within the same geographical boundaries. To date, there has been no previous research carried out from a Small Island Developing States (SIDS) perspective in this field of study. As such the market and sustainability theories need to be investigated from a new geographical focus and different cultural landscape, that is, in Mauritius. The outcomes of the study may be potentially different from the existing literature and therefore the findings of the study, taking support from the theoretical frameworks, will contribute to the existing literature from a SIDS perspective. Besides, previous studies have found that the level of impact of socially responsible activities on stock prices also varies geographically, for the differences in national and international cultures exhibit varying behavioural patterns (Karlsson and Chakarova, 2008; Amankwah and Abonge, 2011).

The growing investor interest in ESG factors and assessing the quality of sustainability reports reflects the view that environmental, social and governance issues, including the risks and opportunities, can affect the long-term performance of issuers and should therefore be given appropriate consideration in investment decisions. In addition, the concept of ESG is still in its early stage in Mauritius (Afrasia, 2020; Lexology, 2020). Thus, the findings of the study to capturing market sentiments to the release of ESG news and sustainability reports will allow market participants to incorporate the ESG factors into their asset allocations and risk decisions, so as to generate sustainable, long-term financial returns for the investors, both individual and institutional, and add value to the share prices of the companies as well. The integration of ESG factors and the relevance of sustainability reports is linked to the forward-looking financially-material information into expectations of returns and risks and will help in generating superior long-terms returns for the Mauritian listed companies.

In light of the growing demand, the financial industry is creating more products and services related to ESG, indices, ratings and funds. Internationally, there has been a shift in the investment principles of market participants for they are engaging more in sustainable investments and seeking to position themselves to the sustainable development transition. Similarly, in Mauritius, the financial and capital markets are responding to investor demands by setting up the SEMSI and delivering sustainable investment products. The findings of the study will point to what extent the launching of the sustainability index adds value to companies listed in the index. Companies listed in the market index will have the incentive to pave their way to the sustainability index and eventually reap from the superior financial returns and broaden their shareholder base. Through the formalisation of the ESG ratings index in the study, the Stock Exchange of Mauritius will have the incentive to build on a formal ESG ratings in Mauritius, to better segregate the release of ESG news and the data in the sustainability reports by listed companies and identify companies that are adopting strong sustainability practices using a set of internationally aligned and locally relevant economic, environmental, social and governance criteria. These incentives represent an added value for listed companies to achieve the Sustainable Development Goals (SDG), which serves as a blueprint to shaping a more sustainable world.

To align with the increasing ESG awareness, companies are even communicating their sustainable commitments through the issuance of sustainability reports. Empirically, limited studies were carried out on how market reactions may, upon publication of sustainability reports, differ between companies listed in sustainability index and companies which are not. As such this study will potentially contribute to the existing literature from a Small Island Developing States (SIDS) perspective. Additionally, the issuance of sustainability reports in Mauritius is not regulated and

monitored yet by an appropriate institutional body. The outcome of the study will highlight the importance of the information and standards of the sustainability reports, and eventually encourage listed companies to opt for publication of the reports through regulated standards. It is important to strengthen ESG investment towards transparency, consistency of metrics, comparability of ratings methodologies, and alignment with financial materiality. The efforts by regulators, standard setting bodies, and market participants in Mauritius is needed to ensure market efficiency, resilience and integrity with the financial and capital markets structure of Mauritius.

#### 4 References

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