AN ANALYSIS OF THE STATE OF SUSTAINABILITY REPORTING IN SELECTED SRI LANKAN COMPANIES.

A dissertation submitted to

The Department of Accounting of

The Faculty of Management Studies and Commerce of

The University of Sri Jayewardenepura

In partial fulfilment of the requirement for the

Bachelor of Science in Accounting (Special) Degree

By

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November 2018

DECLARATION

The work described in this dissertation was carried out me under the guidance of Senior Professor Kennedy D. Gunawardena and has not been submitted elsewhere.

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ACKNOWLEDGEMENT

The writing of this dissertation has been assisted by many generous individuals and I wish to express my humble gratitude to them

First and foremost I would like to express my sincere gratitude to my research supervisor Senior Prof. Kennedy D. Gunawardena for the extensive knowledge shared with me and for the generous assistance and the encouragement rendered to me throughout the research period.

Secondly, I would like to thank the University of Sri Jayewardenepura and the Faculty of Management Studies and Commerce for the knowledge and the skills given to me during the past four years.

Thirdly, I would like to thank all the lecturers of the university for the tremendous support rendered to me during my university journey.

Last but not least I would like to express my heartfelt gratitude to my beloved family and my friends for supporting me throughout my journey and being my pillars of strength in times of need and for motivating me to achieve greater heights.

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ABSTRACT

The main aim of this study is to analyse the state of sustainability reporting in Sri Lanka. This paper analyses the current state of sustainability reporting in Sri Lanka, the trends in sustainability reporting in Sri Lanka, the relationship between organizational financial performance and the state of sustainability reporting and the relationship between organizational environmental performance and the state of sustainability reporting.

This study was based on 18 selected listed Sri Lankan companies consecutively recognized for their sustainability reports by professional accounting bodies. The sustainability disclosures in annual reports of the selected companies for the past five years (2013-2017) were analysed.

The state of sustainability reporting for each company for each year was computed by scoring the GRI – GR core disclosures included in annual reports using a five level ordinal scoring system developed by Dragmoir (2010) inspired by the GRI guidelines and then the trend analysis was conducted for each company and all 18 companies as a whole based on the calculated state of sustainability disclosure finally multiple regressions were conducted to identify the relationships between organizational financial performance and the state of sustainability disclosures as well as the relationship between organizational environmental performance and the state of sustainability disclosures.

Based on the research findings of the study it was concluded that despite not having attained the expected state of sustainability reporting Sri Lanka is on a continuously improving journey to achieve there and that the financial performance do not impact on the state of sustainability reporting but environmental reporting do impact the state of sustainability reporting in the Sri Lankan context.

Key words: State of sustainability reporting, Trends in sustainability reporting, Financial performance, Environmental performance

Chapter 01: Introduction

1.1. Introduction to the study

Noreena Hertz, an English academic, author and an economist stated that

> Transparency, accountability and sustainability have become the slogans of the market leaders. Companies carry out environmental and social audits to court the consumer, and even the bluest chips woo organisations such as Greenpeace and Amnesty.

Organizations use accounting as a method of discharging their accountability to stakeholders. The conventional method of disclosing accountability was issuing financial reports to demonstrate the organizational financial performance of organizations to discharge the accountability to the immediate stakeholders of the organizations.

With the heavy attention placed on environmental impacts, sustainability, corporate governance by the society organizations were compelled to disclose non-financial information to discharge their accountability to the entire society. In the 1970's "Social Reporting" emerged and in the 1980's "Environmental Reporting" arose with the aim of disclosing non-financial information to interested parties. "Sustainability Reporting" which was developed in the 1990's could be considered as the latest form of environmental reporting and its' purpose is disclosure of information related to sustainability performance of an organization.

As per the GRI, "A sustainability report is a report published by a company or organization about the economic, environmental and social impacts caused by its everyday activities. A sustainability report also presents the organization's values and governance model, and demonstrates the link between its strategy and its commitment to a sustainable global economy."

Sustainability reporting and sustainability reporting is not a mandatory requirement in many countries as well as in Sri Lanka. Even though Sustainability reporting is a voluntary practise the number of companies that issue sustainability reports is increasing rapidly both in the global context as well as in the Sri Lankan context.

Sustainability reporting provide organizations with communication tools to disclose their sustainability performance to their stakeholders thereby enabling them to meet the stakeholder expectations about and legal requirements with regard to sustainability performance. Sustainability reporting provides organizations with a better media exposure that would establish trust in the society about the organization and to create a better corporate image about the organization in the public which would help an organization to attract more investment funds as well as environmentally conscious customers thereby giving them a competitive advantage over their competitors who are not engaged in sustainability reporting. The benefits of engaging in sustainability reporting mentioned above motivate an organization to engage in sustainability reporting and disclose their sustainability performance.

In order for a sustainability report to provide a true and fair view about the sustainability performance of an organization then the sustainability report should include transparent, credible, relevant and complete information about the sustainability performance of the organization and it should include both positive and negative incidents with regard to sustainability performance of the organization.

1.2. Problem Statement

Sustainability reporting is voluntary in many countries and GRI is a principle based organization which provides only guidelines and not strict rules organizations are given the leeway of deciding what to be presented and what to be omitted in sustainability reports. Therefore, there exists a practical gap in the expected state of sustainability reporting and the actual sustainability reporting. Furthermore, as mentioned above organizations engage in sustainability reporting to appear sustainable and to attract positive social reactions therefore it is likely that organizations are going to exaggerate about positive sustainability performance and soften negative sustainability performance.

Hence, it is likely that there is a practical gap between the sustainability performance and sustainability reporting of organizations.

Furthermore, it’s evident that companies do not necessarily disclose all the available sustainability information to the stakeholders in their sustainability reports and instead take an approach of selective disclosure of information. Therefore, it is likely that sustainability

reporting has not yet reached the state that the GRI has expected and that there is a practical gap between the current state of sustainability reporting and the expected state of sustainability reporting.

Moreover, there are no unified opinions in the academic world regarding the relationship between organizational financial performance and the state of sustainability reporting and the relationship between organizational environmental performance and the state of sustainability reporting. Therefore, there exists a theoretical gap with relation to the above mentioned relationships.

This research aims to analyse the **current state** of the sustainability reporting of listed companies in Sri Lanka.

The following problem statement was identified.

What are the existing sustainable disclosure practices in the annual reports of selected listed companies in Sri Lanka and are there any significant relationships between organizational financial performance and sustainability reporting and between organizational environmental performance and sustainability reporting?

1.3. Objectives of the Study

Given below are the objectives of conducting this research.

1. To find out the existing state of sustainability reporting practices of listed companies in Sri Lanka.
2. To identify the last 5 years' sustainability reporting trends, after the classification of disclosure categories.
3. To identify the dominant disclosure category in Sri Lanka and to analyse the reason for the dominance.
4. To find out the relationship between the organizational financial performance of organizations and the state of sustainability reporting in Sri Lanka of organizations.
5. To identify the relationship between the organizational environmental performance of organizations and the state of sustainability reporting in Sri Lanka of organizations.

1.4. Significance of the study

It is broadly accepted that organizations are moving away from traditional financial reporting and moving towards sustainability reporting due to an array of reasons. (Lozano et al (2016)).

Even though the rate of diffusion of sustainability reporting is high the extant literature suggests that the organizations do not disclose all the available information regarding the sustainability performance of the organization due to the leeway given by the voluntary nature of the disclosures. (Henriques (2007), (Hummel & Schlick (2016)) and MacLean & Rebernak (2007). Since the organizations do not fully disclose all the sustainability related information the state of sustainability reporting in Sri Lanka has still not reached the level of disclosures expected by the GRI.

This study contributes to the existing literature by identifying the current state of sustainability reporting in Sri Lanka and the trend of sustainability reporting in Sri Lanka for the past five years which would be help to understand whether there is a gap between the desired state of sustainability reporting and the current state of sustainability reporting or not.

Moreover, the available literature fails to give an absolute verdict about both the relationship between organizational financial performance and the state of sustainability reporting and the relationship between organizational environmental performance and the state of sustainability reporting and has established mixed thoughts. (Brey & Haavaldsen (2015) and Clarkson, Li, Richardson, & Vasvari (2008.)) This study contributes to the existing literature by analysing those relationships in relation to the Sri Lankan context which would help to establish a verdict in terms of the Sri Lankan context.

1.5 Scope of the Study

The study is based on 18 listed Sri Lankan companies who have been consecutively awarded for their sustainability reports by professional accounting bodies representing various business industries including Manufacturing, Banking and Finance, Tourism and Leisure, Export, Engineering and construction, Power and etc.

Even though, the sample is representative of many industries this sample does not necessarily represent all the business industries in the world and therefore the findings of this study might not be universally acceptable to all the business industries in the world.

Moreover, the sample consists of the best in class when sustainability reporting in the Sri Lankan context is considered. However, it cannot be assumed that the levels of sustainability reporting in other business organizations are in par with the selected few organizations. Therefore, the research findings might not be applicable to all the business entities in the country.

Auxiliary, only a few key variables were used to measure the relationships between organizational financial performance and sustainability reporting as well as organizational environmental performance and sustainability reporting. Therefore, the research findings might not be applicable if other variables are used instead of the variables used in this study.

Further, this study was conducted in Sri Lanka where sustainability reporting is voluntary. Hence, the research findings might not be applicable to a country where sustainability reporting is mandatory.

Finally, the findings might not be applicable to companies who are not listed on a stock exchange.

1.7. Structure of the report

The rest of this report is organized as follows. Chapter two reviews the existent literature on sustainability reporting while chapter three discusses the methodology employed in the study followed by chapter four which analyses the research findings and discusses the findings with relation to empirical findings and the conclusion of the study and finally chapter five which provides a brief summary to the research study.

Chapter 02: Literature Review

2.1. Introduction

This chapter provides an overview of the extant empirical literature on sustainability reporting which highlights the purpose of engaging in sustainability reporting, the key motivating factors which compelled organizations to embrace sustainability reporting, the performance-portrayal gap in sustainability reporting and the relationship between organizational financial performance and sustainability reporting.

2.2. Sustainability report

The GRI defines a sustainability report as a report published by an organization about the economic, environmental and social impacts caused by its actions and the consequences of those actions on the wider society. The GRI believes that a sustainability report benevolences the organization's values and governance model, and demonstrates the link between its strategy and its commitment to a sustainable global economy and communicate its sustainability performance to the stakeholders.

2.3. Motivating factors that encourage organizations to adopt Sustainability Reporting.

As per, Lozano et al (2016) organisations arrive at the decision to publish Sustainability Reports due to a combination of internal motivations and external stimuli. Herremans et al (2010) acknowledged that regulative aspects (self-imposed regulation), normative aspects (shareholders 'resolutions) and cognitive aspects (corporate values of the top executives) are the motivations that encourage organisations to engage in sustainability reporting.

Several key researchers in the area of Sustainability reporting identified that organizations engage in sustainability reporting due to either the belief of the managers that there is an accountability or a responsibility to report the sustainability performance ((Hasnas (1998), Donaldson & Preston (1995) and Freeman & Reed (1983)) or the desire to comply with the community expectations (Deegan (2002)) or the desire to comply with industry requirements or particular codes of conduct (Deegan and Blomquist 2001) or economic rationality considerations ((Friedman 1962) or to forestall efforts to introduce more onerous disclosure regulations (Deegan and Blomquist 2001) or to reduce agency costs and to claim legitimacy (Reverte (2009) ,Watts and Zimmerman (1978) and O' Dwyer (2002)) or to develop and

maintain healthy relationships with stakeholders (Lopez et al (2007) ,Cortez and Cudia (2011)).

2.4. The purpose of Sustainability Reports

The purpose of a sustainability report is to provide assistance to firms in being accountable to various stakeholders, to meet their expectations and to demonstrate compliance with sustainability standards (Roberts (2009), ISEA (Institute on Social and Ethical Accountability (2003) and Unerman et al (2007)) and to provide stakeholders with enhanced information to make informed decisions. (GRI 2013).

GRI (2006) emphasizes that Information and processes used in the preparation of sustainability reports should be gathered, recorded, complied, analysed and disclosed in a manner establishes the quality and materiality of the information and improves the overall accountability of the organization.

Adams (2004) has recognized that for sustainability reports to be accountable, then the reports need to demonstrate corporate acceptance of its ethical, social and environmental responsibility.

As per the AccountAbility AA1000AS standard on accountability for sustainability, Accountability is made up of three principles namely transparency, responsiveness and compliance.

2.4.1. Compliance

As per the GRI (2006) sustainability reports issued by companies should comply with the GRI guidelines and other regulations applicable.

2.4.2. Responsiveness

The GRI (2006) states that sustainability reports should be responsive to societal expectations or in other words should react to the changes in social expectations to cater the information needs of the users of sustainability reports.

2.4.3. Transparency.

The GRI (2006) specified that a sustainability report should reflect positive and negative aspects of the organization's performance to enable a reasoned assessment of overall performance and formulated three essential recommendations for the purpose of application

of the principle of balance which improves the transparency of the information disclosed by an organization. The GRI guidelines established that when preparing sustainability reports companies should avoid commissions or selective presentation of material information, include both adverse and favourable actions of the organization and the corresponding results should clearly distinguish between the presentation of facts and the company's interpretation of information.

Several key researchers believe that the transparency of sustainability reports is related to the credibility, completeness and reliability of the disclosed information. (Menendez- Viso (2009), Livesey & Kearins (2002) and Dando & Swift (2003)). Credibility of the information refers to the trustworthiness of the information presented in a sustainability report or in other words how much can a reader of the sustainability report can trust the organization and the discharges made by them with regard to sustainability. The principle of completeness of the information establishes that the entire positive and the negative information regarding sustainability that is material to the judgements of the readers should be included in sustainability reports. Reliability of the information presented states that the information presented should be true and non-fiction and should provide the readers with actual information to base their decisions on.

Numerous key contributors to the literature on the topic has identified that in the absence of such transparency, sustainability reports tend to resemble marketing tools primarily aimed at improving the firm's image and social legitimacy rather than disclosure tools aimed at the improvement of accountability of the organization. (Lauer (2003), Duchon & Drake (2009), Milne et al (2006), Deegan et al (2006) and Cho & Patten (2007)).

2.5. Criticisms against Sustainability Reports.

The available literature suggests that most business entities reporting on sustainability and claim to carry out their business activities sustainability actually have little or nothing to do with sustainability. (Beder (1997), Gray & Milne (2002), Milne, Tregida & Walton (2003), Gray (2006-b) and Milne and Kearins & Walton (2006)) and what organizations account for sustainability are probably not accounts of their true sustainability performance and are often used as mechanisms of manipulating the users. (Gray & Milne (2002), Gray & Milne (2004) and Milne, Ball & Gray (2008)).

Key contributors to the topic has identified that the organizations who are engaged in sustainability reporting are often limited to reporting and does not practise what they report. Researchers have further argued that when a corporate body talks of "sustainability" it is not actually talking about sustainability but (probably) environmental management and some ill-defined form of social responsibility (Gray (2006), Young & Tilley (2006) and Pataki (2009)).

The main criticisms regarding sustainability reports are presented below.

2.5.1. Voluntary Disclosure

Since Sustainability reporting is a voluntary, the companies engaged in sustainability reporting provide sustainability information related to social and environmental issues at their discretion (Sisaye (2011a), Sisaye (2011b) and O'Dwyer (2003)). As a result of the voluntary nature of the disclosures provided, the content of the sustainability reports seem extremely subjective and highly dependent on the type of social and environmental problems that the companies are addressing in the community.

Firms with superior sustainability performance is given the opportunity to choose high quality sustainability reporting to signal their superior sustainability performance and firms with poor sustainability performance are given the chance to engage in low quality sustainability reporting to protect their legitimacy by the voluntary nature of sustainability reporting. (Hummel & Schlick (2016)).

Non-financial voluntary disclosures such as sustainability information are often not verified by auditors and as result the management has more leeway to choose the type, content, and timing of such disclosures (Choi, Myers, Zang & Ziebart (2010)) which leads managers to engage in selective disclosure of sustainability information which enables managers to underplay negative performance and exaggerate positive sustainability performance (Henriques (2007), MacLean & Rebernak (2007)).

2.5.2 Self-interest motives and Impression Management.

2.5.2.1 Self- Interest Motives

As discussed above organizations are stimulated by a collection of motivators. Even though, the purpose of engaging in sustainability reporting is the disclosure of accountability to the

wider society with regard to the sustainability performance of the organization, some organizations are motivated by self-interested objectives in engaging in sustainability reporting.

Key researchers have established that the disclosed information in sustainability reports tend to reflect business interests rather than a genuine concern for transparency and accountability of the organizations. (Laufer (2003), Cho et al (2010), Adams (2004), Gray (2006) and Milne et al (2006))

The available literature on the area has identified numerous self- interest objectives which motivates organizations to engage in sustainability reports.

- The mimicry of the trend set by close competitors in issuing sustainability reports and the industry pressure (Frenkel (2008))
- To face the threats to the organizational legitimacy (Deegan et al (2000), Patten (2002)).
- To comply with societal expectations (Deegan (2002))
- The desire to win particular reporting awards for the issued sustainability reports. (Deegan & Carrol (1993))
- The desire to comply with borrowing requirements and attraction of investment funds from capital providers concerned about the sustainable performance.
- Management of particular stakeholder groups highly interested in the sustainability performance of the organization. (Ullman (1985), Roberts (1992), Evan & Freeman (1988) and Neu et al (1998)).
- Development and maintenance of long term healthy relationships with stakeholders (Lopez et al (2007) and Cortez & Cudia (2011)).

2.5.2.2 Impression Management tool.

The key contributors to the topic believe that the concern of the management on the company's image and social legitimacy with various stakeholders tends to favour sustainability reporting as marketing and impression management rationale intended to seduce and persuade stakeholders rather than to straightforwardly present the firm's actual situation with regard to the sustainability performance. (Cerin (2002), Coupland (2006) and Hooghiemstra (2000)).

Hence, sustainability reports are often understood in the available literature as marketing instruments, tools for social legitimation (Duchon and Drake (2009), Milne et al (2006), Deegan et al (2006) and Cho and Patten (2007)) or impression management strategies (Cho et al (2012), Merkl- Davies and Brennan (2007), Merkl- Davies and Brennan (2011) and Merkl-Davies et al (2011)) rather than as a source of reliable information for stakeholders.

Studies have further stressed organizations are using the concept of sustainability reporting mostly as a marketing tool that gives birth to biased and superficial explanations of sustainability disconnected from internal practices of the organization. (Springett (2003), Moneva et al (2006), Markus & Gray (2007), Boiral & Roy (2007) and Devinney (2009)).

2.5.3. Lack of expected level of accountability in the disclosed information.

Critics argue that the practise of sustainable reporting is flawed in the sense that there is a lack of confidence in the content of the report and the main challenges identified by these critics are accuracy, sincerity, and completeness (Doane (2000)) or that the non- financial reports consist of mere images than the actual performance. (Bowers (2010)).

Researchers have emphasized on the fact that sustainability reports often do not meet the principles of balance, exhaustiveness and transparency and therefore the credibility of the disclosed information is questioned. (Boiral & Henri (2015), Boiral (2013) and Dingwerth & Eichinger (2010)) The accuracy of information is one of the main issues in sustainability reporting due to the lack of balance, completeness and transparency of the presented information. (Dando & Swift (2003), Perez & Sanchez (2009) and Cho et al (2012)).

Moreover the current literature suggests that due to emphasis placed on the firm's projected image to outside parties rather than on the substantive integration of reporting practices, sustainability reporting is not beneficial to transparency and instead encourages a symbolic and a superficial approach primarily intended to showcase the firm's socially responsible behaviour. (Milne et al (2006) and Wagner et al (2009)).

Key contributors to the area have further identified that the lack of full disclosure in sustainability reports, the lack of completeness of information and the little coverage of negative impacts of organizational activities in sustainability reports reveal that sustainable reports are issued to meet minimum requirements and the disclosure of performance

indicators varies significantly even among firms with the same level of application sustainability reporting principles. (Adams & Whelan (2009) and Aktas et al (2013)).

The available literature further suggests that the disclosure of information in sustainability reports echoes opportunistic conduct of the reporting entities which results in both the manipulation of stakeholders and an exploitation of information asymmetry between the reporting entities and their stakeholders. (Merkl- Davies & Brennan (2007)

2.5.4 Flaws of sustainability reports.

The available literature suggests that sustainability reports are flawed and fails to deliver the expected results and that the sustainability reports offer no evidence or reasoning that connects the operation of these organisations with the perilous state of the planet.

Aras & Crowther (2009) emphasized that current sustainability reporting fails to highlight the environmental risks and opportunities of business and fools the stakeholders including capital providers by cloaking the readers of the reports in a mask of ignorance and environmental risks.

Researchers have criticised the sustainability reports for their opacity, questionable connection with the firm's real situation and the superficial nature and have established that the sustainability reports are far from reality. (Moneva et al (2006), Unerman et al (2007) and Gray (2010)).

Furthermore, the lack of clarity in sustainability reports, information overload, inclusion of confusing and misleading information and the confusing language used to mystify the poor sustainability performance with the intention of fooling the readers has been highlighted in the literature (Debord (2002), Rutherford (2003), Cho et al (2015) and Boiral (2013)).

When looking at the criticisms against sustainability reporting highlighted in the available literature it is visible that the available literature suggests that there is a disclosure gap between sustainability reporting and corporate sustainability practices.

2.6. Methods adopted to improve the quality of disclosures of sustainability reports.

With the increasing criticisms on the quality and the level of disclosures of sustainability reports, various new methods such as social auditing, stakeholder engagement, counter accounting, applications of standards and etc. were introduced to the corporate world and the corporate world embraced these methods warmly with the intention of improving the quality of the disclosures made.

2.6.1. Social Audits

As per Zhang et al (2003), social auditing is a vigorous process consisting of planning, accounting, auditing and reporting, embedding and stakeholder engagement followed by an organisation with the intention of accounting for its sustainability performance and improving its sustainability performance.

The available literature establishes that the process of social auditing enables an organisation to evaluate its sustainability performance in relation to society's requirements and expectations which helps organizations to further reinforce their sustainability performance and sustainability reporting. (Vinten (1990) and Elkington (1997)).

Social auditing is being undertaken by organizations at a rapid rate and regarded as a successful endeavour that has guided organizations involved with sustainability reporting to become more transparent and open to stakeholders. (Rotheroe et al 2003)

2.6.2. Stakeholder Engagement

Stakeholder engagement is placing the stakeholder interests at the heart of the corporate sustainability to enhance the mutual understanding of sustainability and to balance the varied interests of stakeholders to ensure balanced outcomes. (ISEA (1999), Wassock (2001), Beckett & Jonker (2002) and Factor (2003)).

AccountAbility Standard 100 (Hereafter referred as AA 100), states that stakeholder engagement is not about organisations relinquishing responsibilities for their activities, but rather using governance to build interactions with their patrons and thereby refining the overall organizational performance, accountability and sustainability.

2.6.3 Counter Accounting

2.6.3.1 Counter Accounting

Boiral (2013) defines counter accounting in the area of sustainability reporting as the process of identifying and reporting information on an organization's significant economic, environmental and social issues that comes from external or unofficial sources in view of verifying, complementing or countering organisations' official report on their performance and achievements.

2.6.3.2. Criticisms against Counter Accounting

The key contributors to the research areas has often questioned about the extent of reliability of these counter accounts and whether the counter accounts portray a true and fair view of the sustainability performance of an organization. Everett & Neu (2000), argue that most if not all of these tentative endeavours to counter account for sustainability have at their core, an attempt to capture and describe a reality to convey a true and fair view of the organisation's sustainability to the readers.

2.6.4 Application of Standards

Sustainability Reporting is a voluntary practise in most of the countries of the world and organizations have the leeway to engage in sustainability reporting as per their wish which has resulted in opacity in sustainability reports as discussed above under the topic 2.5.1.

Boiral & Yves Gendron (2010), suggest that a certification based on recognized standards can therefore be viewed as a mechanism to transform the opacity inherent in the notion of accountability into a sort of sign or trademark easily recognizable in the eyes of external stakeholders.

The Sustainability Accounting Standards Board (Hereafter referred as SASB) was founded in 2011 to develop and disseminate sustainability accounting standards. Various organizations have introduced standards on sustainability even prior to the establishment of the SASB. However, only the literature on GRI standards will be reviewed under the literature review.

2.6.4.1. GRI

The GRI is an independent international organization founded in 1997 that issues standards and guidelines to help organizations to comprehend and acknowledge the impacts of their

actions on the society and the environment. The GRI standards are regarded as the best standards of guiding and certifying sustainability reporting.

As per Roca & Seacry (2012), the guidelines focus on the context of corporate sustainability reports, the vision of the company concerning sustainability, their objectives in sustainability and their sustainable performances.

Key contributors to the literature on the research area has identified that the GRI aims to develop a voluntary reporting framework that will elevate sustainability reporting practices to a level equivalent to that of financial reporting in terms of rigour, comparability, auditability and general acceptance (Willis (2003), Bhimani & Soonwalla (2005), Simnett et al (2009) and GRI (2010)) and the implementation of GRI indicators has increased the rigor and reliability of the reporting process (Dando & Swift (2003) and KPMG (2013)).

2.6.4.2. Criticisms against GRI

However, there are several arguments that suggest that application of GRI standards has not improved the quality of the sustainability reports.

Mori & Best (2017) criticises GRI framework stating that GRI accepts sustainability reports without any restrictions such as a clear definition of organisation's boundaries, development of integrated indicators or the attachment of an independent third party assurance statement.

Furthermore, the GRI framework is criticised for being general and containing many indicators that are not equally useful for all the companies (Goel 2005), failing to capture all the relevant sustainability development indicators (Moneva (2005) and Asif et al (2011)) and the guidelines being of voluntary nature and failing to resolve the incompleteness problem of sustainability reports and not being regulated and worked out to a degree close to the financial standards (Ihlen 2008)

2.6.5. External Assurance

2.6.5.1. External Assurance

The GRI define external assurance as the use of external, independent reviews of sustainability management processes and final disclosures is intended to increase the robustness, accuracy and trustworthiness of disclosed information.

SustainAbility's (2002) analysis of 'sustainability reporting' indicates that 68% of the world's best sustainability reports (as selected by an 'independent selection committee' working for the SustainAbility consultancy), feature some form of assurance statement.

The key researchers of the area has identified that certification practices of sustainability reporting (also called assurance) are influenced, to a large extent, by the exemplification of financial auditing and that sustainability reports often appear as a logical and necessary extension of financial reports, considered by many as too narrowly focused on economic indicators and shareholder's interests (Yongvanih & Guthrie (2006), Bebbignton and Gray (1993) and Unerman et al (2007)) and also that certification mechanisms are supposed to guarantee, through auditing procedure, the compliance of organizational practices or accounts with specific standards (Power (1997), KPMG (2008) and Rasche (2009)).

The current literature considers the assurance process as a prized tool which provides integrity for sustainability reports and contributes towards organisational improvement in terms of improvements in internal control structures, increase in transparency and credibility in relation to the information disclosed to their stakeholders. (Deegan et al (2006), Hodge et al (2009), Simnett et al (2009), Zorio et al (2012) and Junior et al (2014)).

Several researchers have identified that assurance provides several benefits such as reduction in agency costs (Carey et al (2000)), deliberation of greater user confidence in the accuracy and validity of the information provided and the improvement of transparency and accountability of the information disclosed. (ISEA (2002) and Gray (2010))

2.6.5.2. Criticisms against External Assurance.

2.6.5.2.1. Unregulated nature of External Assurance

Several key contributors to the area argues that because assurance of sustainability reports is not regulated in the majority of countries, there are different types of assurance providers providing assurance services using different frameworks , scopes, methodologies and assurance statements (O'Dwyer & Owen (2005) ,Deegan et al (2006) , Moneva et al (2006), KPMG & SustainAbility (2008), Owen et al (2009) and Perego (2009)). Mori & Best (2017) has identified that the existence of different types of assurance processes conducted by different types of assurance providers affects the capacity of stakeholders to understand the

assurance practise and the assurance statements provided by the assurers which limits the usefulness of assurance statements.

2.6.5.2.2. Independence of Auditors

Even though, some available literature argues that external audits contribute to strengthening the credibility of the information for stakeholders (Adams & Evans (2004), Wheeler & Elkington (2001) and Simnet et al (2009)), the reliability and independence of the assurance process of sustainability reports have been continuously questioned by various key researchers. (Patten (1991), Laufer (2003), Dando & Swift (2003), O'Dwyer & Owen (2005), O'Dwyer et al (2011)).

Boiral & Gendron (2010), states that as a result of institutional weakness regarding ethics regulation and training requirements, it is expected that sustainability auditors will be much influenced by commercial pressures while not being significantly affected by the threat of professional sanctions in case of misconduct or conflict of interest.

2.6.5.2.3 Limitations of External Assurance

Key contributors to the research area has identified that lack of transparency and comparable verification criteria are among the various problems relating to the practice of external verification and assurance, limited stakeholder participation hinders the value of external assurance (O'Dwyer & Owen (2007), Kamp-Roelands et al (2008) and Manetti & Becatti (2009)).

Adams & Whelan (2009), highlights that the external assurers place their focus only on the verification of reports and not on assessing sustainability performance and are unable to guarantee that a sustainability report will not be used to legitimize corporate action

Bepari & Mollik (2016) has identified that due to scope limitation placed on the assurance engagement, the reluctance of the assurors to address the assurance statements to stakeholders and the lack of stakeholder's engagement in the assurance process, the assurance practices of sustainability reporting serves more a an internal control instrument rather than an accountability mechanism. Furthermore, Power (1997) suggests that much assurance practise is designed to bring inquiry to an end.

2.7. The relationship between organizational financial performance and sustainability reporting

Brey & Haavaldsen (2015) , has identified that the extant literature on the area has established inconsistent schools of thoughts regarding the relationship between organizational financial performance of a company and sustainability reporting and more specifically suggest both that there is a there is both a positive and non-existent relationship between the two factors.

Moreover, Dowell et al. (2000) found that previous studies conducted on the financial performance and the quality of sustainability reporting affecting the firm value have generated consistent results in multinational enterprises in USA and Europe, but shown mixed results in developed and emerging countries.

2.8. The relationship between organizational environmental performance and sustainability reporting

Boiral (2010) established that there is a significant association between contemporaneous environmental performance and sustainability disclosure and that bigger polluters tend to disclose more on their activities with the objective of preserving their legitimacy.

However, prior researches conducted on the relationship between organizational environmental performance and sustainability reporting provides mixed results on the relationship between corporate environmental performance and the level of sustainability disclosures where some researchers have established that there is a relationship between the two and some have established that there is no relationship between the two. (Clarkson, Li, Richardson, & Vasvari (2008)

2.9. The state of sustainability reporting in Sri Lanka

2.9.1. Factors that influence the state of sustainability reporting in Sri Lanka

Shamil et al (2014) examined the influence of board characteristics on sustainability reporting in Sri Lanka, a country considered as a developing economy with an emerging equity market. It was revealed that both board size and dual leadership are positively associated with sustainability reporting and boards with female directors are negatively associated with sustainability reporting.

Abeydeera et al (2016) examined the relationship between Sri Lankan culture influenced by the strong presence in Buddhism and sustainability reporting. It was identified that sustainability reporting for majority of the analysed organizations was simply about explicitly embracing global standardisation. Furthermore, it was established that the standardisation of corporate sustainability reporting through the pursuit of globally accepted reporting frameworks is argued to have caused disconnect between local culture and context and the corporate representations evident in such reporting.

The extant literature reveals that sustainability reporting is likely to be influenced by firm size and firm growth and that younger firms are likely to adopt sustainability reporting (Fernando & Pandey (2012) & Shamil et al (2014)).

2.9.2 The current state of sustainability reporting in Sri Lanka.

Dissanayakea, Tilta, Lobob (2016) established that in Sri Lanka there is a major focus on social indicators, despite the poor environmental record in the country when it comes to sustainability reporting in Sri Lanka. Furthermore, it is suggested that the economic context therefore appears to be a significant factor influencing how sustainability reporting develops in Sri Lanka.

The existing literature suggests that majority of Sri Lankan companies do not consider GRI Guidelines in reporting for sustainability and disclose sustainability information in annual reports in various manner without paying reference to the GRI guidelines (Senaratne & Liyanagedara (2009) and Fernando & Pandey (2012)).

The extant literature further reveals that there is an expectation gap as to the information needs of stakeholders on sustainability reporting and the information disclosed in the annual reports of companies in the Sri Lankan context (Senaratne & Liyanagedara (2009) and Wijesinghe (2012)).

Moreover, the available literature establishes that there is long way forward for Sri Lankan companies in respect of sustainability reporting (Senaratne & Liyanagedara (2009)) but despite the long way there is an attractive growth reported in the level of disclosures in sustainability parameters (Wijesinghe (2012)).

Chapter 03: Research Methodology

3.1. Introduction

Following the analysis of literature, this section presents an overview of the conceptual framework, the source and the type of data used, statistical tests performed and other methods employed in order to achieve the research objectives.

3.2. Conceptual Framework

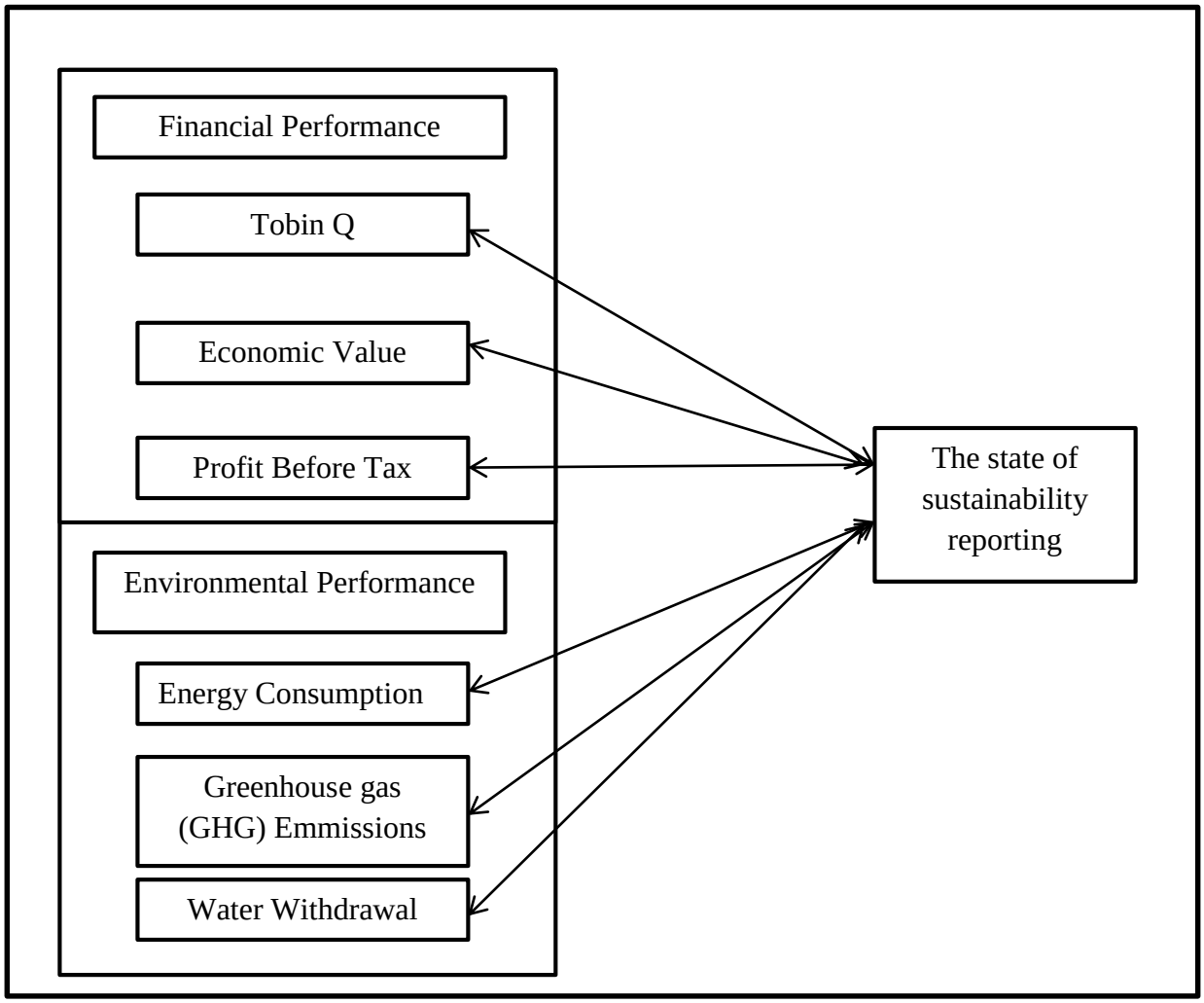

Figure 01: The conceptual diagram

3.3. Data

3.3.1. Sample selection

This study is based on 18 Sri Lankan listed companies who have been recognized consecutively for their sustainability reports by professional accounting bodies including ACCA and ICASL. A sample consisting of the 18 organizations who are considered to be the top practitioners of sustainability reporting was chosen because analysing the sustainability reports the best in class when it comes sustainability reporting would give a better understanding about the current state of sustainability reporting in Sri Lanka.

3.3.2. Data collection

The required data was collected through annual reports which includes sustainability reports analysis conducted for all selected companies for five years each (From 2013 – 2017). The collected is described below under the topic "data description".

3.3.3.Data Description

The collected data are described under three sub topics namely the state of sustainability reporting in Sri Lanka, organizational financial performance and organizational environmental performance.

3.3.3.1. The state of sustainability reporting in Sri Lanka

The state of sustainability reporting in Sri Lanka for each company for each year are measured by scoring the degree of GRI – G4 core disclosures disclosed in sustainability reports using a five level ordinal scale scoring system built by Dragmoir (2010) to identify the state of sustainability reporting in Sri Lanka in Sri Lanka.

Every core disclosure of the GRI – G4 guidelines presented in sustainability reports of each company for each year were scored using the following scheme for a maximum possible score of 220 where maximum possible scores for economic, environmental and social disclosures are 28, 68 and 124 each respectively.

The marking scheme used to score the core sustainability disclosures is given as an appendix at the end of the paper. (Appendix 01)

The five level ordinal scoring scale used is provided below.

0 – Performance data not present. (Including any non-quantitative references to performance)

1 – Performance and/or governance data is presented only for the current period.

2 - The report and the information contained within it can be compared on a year –to – year basis.

3 – The criteria above, plus the data measurement techniques and bases for calculations are adequately described and can be replicated with similar results.

4 – The criteria above, plus the organization's performance can be compared with appropriate benchmarks.

3.3.3.2. Organizational financial performance

The organizational financial performance of each company for each year was measured using four variables namely the total assets of the company, market capitalization and the economic value generated and profit before tax. These data was extracted from the annual reports of each company for the respective year.

3.3.3.3. Organizational environmental performance

The Organizational environmental performance of each company for each year was measured using two components namely the energy consumption and greenhouse gas (GHG) emissions, solid waste disposed and water withdrawal. These data was extracted from the annual reports of each company for the respective year.

3.3.4. Model Development

This sub section provides a synopsis of the model employed, statistical tests conducted and other techniques used to accomplish the research objectives of the study. The methods employed to obtain each objective are described.

In order to achieve the first objective of the study ,the core GRI – G4 sustainability reporting made by organizations are ranked using the scoring system developed by Dragmoir (2010) as discussed above under the topic 3.2.3 to identify the current state of sustainability reporting in Sri Lanka.

Secondly, both a graphical analysis using line charts and a percentage analysis using the first year under consideration (2013) as the base year are conducted as trend analysis to achieve the second objective of the study.

Both the third and the final objectives of the study are achieved through conducting multiple regression analysis.

3.3.4.1. Development of Hypotheses

3.3.4.1.1. The relationship between organizational financial performance and the state of sustainability reporting.

The following hypotheses were developed with the aim of achieving the third objective of identifying the relationship between organizational financial performance of an organization and the state of sustainability reporting in Sri Lanka of the said organization.

The main hypotheses with relation to the relationship between organizational financial performance and the state of sustainability reporting are given below.

H_0 - There is no significant relationship between the state of sustainability reporting and organizational financial performance by Tobin Q, Economic value and profit before tax.

H_1 - There is a significant relationship between the state of sustainability reporting and organizational financial performance by Tobin Q, Economic value and profit before tax.

The auxiliary hypotheses for each element are as given below.

1. Tobin Q

   $H_0$1 – There is no significant relationship between Tobin Q and the state of sustainability reporting.

   $H_1$1 – There is a significant relationship between Tobin Q and the state of sustainability reporting.

2. Economic Value

   $H_0$2 – There is no significant relationship between Economic value and the state of sustainability reporting.

   $H_1$2 – There is a significant relationship between Economic value and the state of sustainability reporting.

3. Profit before Tax

   $H_0$3 – There is no significant relationship between Profit before Tax and the state of sustainability reporting.

   $H_1$3 – There is a significant relationship between Profit Before Tax and the state of sustainability reporting.

3.3.4.1.2. The relationship between organizational environmental performance and the state of sustainability reporting.

The following hypotheses were developed with the aim of achieving the final objective of identifying the relationship between organizational environmental performance of an organization and the state of sustainability reporting in Sri Lanka of the said organization.

The main hypotheses with relation to the relationship between organizational environmental performance and the state of sustainability reporting are given below.

H_0 - There is no significant relationship between the state of sustainability reporting and organizational environmental performance by energy consumption, GHG emissions and water withdrawal.

H_1 - There is a significant relationship between the state of sustainability reporting and organizational financial performance by energy consumption, GHG emissions and water withdrawal.

The auxiliary hypotheses for each element are as given below.

1. Energy consumption

   $H_0$4 – There is no significant relationship between Energy consumption and the state of sustainability reporting.

   $H_1$4 – There is a significant relationship between Energy consumption and the state of sustainability reporting.

2. GHG emissions

   $H_0$5 – There is no significant relationship between GHG emissions and the state of sustainability reporting.

   $H_1$5 – There is a significant relationship between GHG emissions and the state of sustainability reporting.

3. Water withdrawal

   $H_0$6 – There is no significant relationship between Water withdrawal and the state of sustainability reporting.

   $H_1$6 – There is a significant relationship between Water withdrawal and the state of sustainability reporting.

3.3.4.2. Statistical model specification

The method employed to study the relationship between the state of sustainability reporting in Sri Lanka and organizational financial performance as well as the relationship between the state of sustainability reporting in Sri Lanka and organizational environmental performance is multiple regressions.

Multiple regression method is used since it is an established principle methodology and it is empirically evident that the researcher is given the ability to incorporate a large range of variables into the model which would enable the researcher to analyse several variables at once (Jenson et al (1996), Chen et al (1986)).

The statistical data software package E-views is used to analyse the data since the data package is more appropriate to analyse panel data.

3.3.4.3. Regression models

Given below are the regression equations employed by the study. The variables employed are briefly mentioned by Figures

Equation 01 was used to identify the relationship between organizational financial performance and state of sustainability reporting in terms of Tobin Q, Economic value added and Profit before Tax. Equation 02 was used to analyse the relationship between organizational environmental performance and the state of sustainability reporting in Sri Lanka in terms of Energy consumption, GHG emissions and Water withdrawal.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Equation 01 : The relationship between financial performance and the state of sustainability reporting

$$Y = \beta_0 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Equation 02 : The relationship between environmental performance and the state of sustainability reporting

Y = The state of sustainability reporting in Sri Lanka.

β0 = The intercept of the regression

β1, β2, β3, β4, β5, β6, = Coefficient of variables

X1 = Tobin Q

X2 = Economic value added (Rs. Million)

X3 = Profit before Tax (Rs. Million)

X4 = Energy Consumption (Kw/H)

X5 = GHG emissions (Metric Tonne)

X6 = Water withdrawal (Litres)

Figure 02 : The variables employed in equations 01 and 02

3.3.4.4. Operationalization of variables

3.3.4.4.1. Independent Variables

The study uses six variables to measure the relationship between the state of sustainability reporting and organizational financial performance and organizational environmental performance. Data for the seven independent variables were extracted from the annual reports for the respective companies for the respective time periods.

The six independent variables are given under the sub section 3.2.4.3. Regression model is briefly described below.

1. Tobin Q is an investor ratio calculated by dividing the market capitalisation of a company by its total assets. This was considered as an independent variable since this demonstrates the market value of the company's asstes.
2. Economic value generated is the after-tax profit that exceeds the required minimum return on capital. Economic value generated was used as an independent variable of measuring financial performance since it is measures the true profitability created for the organization.
3. Profit before tax is the profit generated by an entity after incurring all the operating costs and the finance costs. Profit before tax measures the performance of an organization for a year. Hence, profit before tax was considered as an independent variable that demonstrates the organizational financial performance.
4. Total energy consumption refers to the total energy consumed by an organization during a year. This was considered to be an independent variable which measures the environmental performance of an organization since the energy coming from various energy sources including electricity, diesel and petrol are generated by consuming natural resources such as coal, water and wind.
5. Effluents and emissions refer to the discharges of sewage, gas, radiation and other elements made to the natural environment by an entity. This was considered to be an independent variable which measures the organizational environmental performance since it measures the damage done to the nature by the organization.
6. Total water withdrawal describes the total amount of water withdrawn from a surface water or groundwater source. Water withdrawal was considered as a measurement of

organizational environmental performance since it measures the water extracted by organizations in their operations.

3.3.4.4.1. Dependent Variable

The dependent variable of the study is the state of sustainability reporting in Sri Lanka. The state of sustainability for each individual company for each year was calculated by scoring the disclosures made by individual companies with regard to the core disclosures of GRI – G4 guidelines as explained under the sub section 3.3.3.1.The state of sustainability reporting in Sri Lanka

3.3.4.5. Statistical tests

Prior to conducting the regression analysis a unit root test (Augmented Dickey Fuller –ADF) was conducted to identify whether data is stationary or has got unit root and a Hausman test was conducted to identify the type of panel data collected.

A confidence level of 95% was considered for the both tests.

3.3.4.5.1. Augmented Dickey Fuller test

Augmented Dickey Fuller test was used to identify whether the data included in the variables have got a unit root or not. The presence of unit root in a data series indicates that there is a possible existence of a long term relationship among the data in the series.

The unit root test for stationarity was conducted out in level difference and for the purpose of conducting a unit root test the following hypotheses were used.

H_0- Variable has got unit root

H_1- Variable is stationary

Each variable was tested individually for unit root using the probabilities for ADF – Fisher Chi – square.

3.3.4.5.2. Hausman Test

The Hausman test was conducted to identify the type of the data used for the analysis i.e. whether the data has the random effect or the fixed effect. For the purpose of conducting the Hausman test the following two hypotheses were used.

H_0 – Data is significantly different for both across different companies and for the same company across time is not significantly different. (Random Effect)

H_1- Data is significantly different across different companies but the data for the same company across time is not significantly different. (Fixed Effect)

Chapter 04: Research Findings and Discussion

4.1. Introduction

This section covers the data analysis conducted and then discusses the findings derived from such analysis. The research findings will be discussed under few key themes namely the state of sustainability reporting in Sri Lanka, the trends in sustainability reporting of Sri Lanka, the dominant disclosure category in Sri Lanka, the results from the statistical tests conducted, the relationship between organizational financial performance and sustainability reporting and finally the relationship between organizational environmental performance and sustainability reporting.

The collected data was analysed under four main phases in the study.

Under the first phase of the analysis the state of sustainability reporting in Sri Lanka of each company for each year has been calculated by scoring the core disclosure elements of the GRI – G4 disclosures using the five level ordinal scale scoring system developed by Dragmoir (2010). The calculated data is presented using a descriptive table.

Based on the findings of the first phase, the second phase analyses the trends in sustainability reporting of the country over the past five years using both a graphical analysis and a percentage change analysis.

The third and fourth phases of the study examines the relationship between the state of sustainability reporting in Sri Lanka calculated under the first phase and organizational financial performance of the organization and the organizational environmental performance of the organization using multiple regression analysis respectively.

4.2. State of sustainability reporting

Table 01 demonstrates the state of sustainability for all the 18 companies for each year under consideration calculated by scoring the sustainability reporting using the system developed by Dragmoir (2010).

The maximum possible scores for a company for a year were 28, 72 and 124 for economic, environmental and social disclosures respectively and for 224 points for total sustainability reporting.

4.2.1. The state of sustainability reporting individually for the selected companies

Company	The state of reporting				
	Year	Economic	Environment	Social	Sustainability
Company 1	2013	8	5	23	36
	2014	9	6	25	40
	2015	10	6	26	42
	2016	12	11	31	54
	2017	14	14	34	62
Company 2	2013	9	18	36	63
	2014	12	20	47	79
	2015	13	24	56	93
	2016	20	30	72	122
	2017	24	35	80	139
Company 3	2013	12	19	35	66
	2014	13	22	44	79
	2015	14	24	51	89
	2016	17	29	69	115
	2017	20	35	76	131
Company 4	2013	10	7	29	46
	2014	11	7	32	50
	2015	12	10	33	55
	2016	15	13	34	62
	2017	20	15	37	72
Company 5	2013	10	11	27	48
	2014	13	15	31	59
	2015	15	16	34	65
	2016	17	20	42	79
	2017	20	26	52	98
Company 6	2013	17	21	21	59

	2014	19	24	27	70
	2015	20	25	30	75
	2016	23	27	39	89
	2017	25	31	46	102
Company 7	2013	16	14	29	59
	2014	16	20	35	71
	2015	17	26	41	84
	2016	20	29	46	95
	2017	23	32	51	106
Company 8	2013	10	23	17	50
	2014	11	28	19	58
	2015	12	36	22	70
	2016	14	37	26	77
	2017	16	40	30	86
Company 9	2013	9	3	13	25
	2014	11	25	29	65
	2015	14	33	38	85
	2016	17	37	41	95
	2017	19	41	49	109
Company 10	2013	4	2	16	22
	2014	6	3	25	34
	2015	8	7	35	50
	2016	14	7	45	66
	2017	18	11	56	85
Company 11	2013	8	1	1	10
	2014	9	1	1	11
	2015	10	30	30	70
	2016	11	37	45	93
	2017	13	47	54	114
Company 12	2013	11	8	33	52
	2014	13	21	35	69
	2015	15	32	39	86
	2016	17	36	45	98
	2017	22	41	51	114

Company 13	2013	7	1	12	20
	2014	8	7	16	31
	2015	9	13	19	41
	2016	11	16	21	48
	2017	12	18	26	56
Company 14	2013	9	7	28	44
	2014	10	5	31	46
	2015	10	13	34	57
	2016	11	16	37	64
	2017	12	18	42	72
Company 15	2013	14	17	24	55
	2014	15	26	29	70
	2015	16	26	31	73
	2016	17	42	38	97
	2017	19	50	42	111
Company 16	2013	10	12	19	41
	2014	11	20	22	53
	2015	12	29	25	66
	2016	13	32	31	76
	2017	14	36	36	86
Company 17	2013	11	12	23	46
	2014	13	14	31	58
	2015	15	26	36	77
	2016	17	31	38	86
	2017	19	34	42	95
Company 18	2013	12	9	37	58
	2014	13	19	39	71
	2015	14	22	41	77
	2016	15	26	48	89
	2017	16	29	51	96

Table 01 : The state of sustainability reporting in Sri Lanka in the selected companies

4.2.2. The state of sustainability reporting as a whole for the all selected companies.

The summation of the scores obtained by the individual companies for each year was then calculated to identify the state of sustainability reporting in Sri Lanka for each period as demonstrated by Table 02.

The maximum possible score for the country per annum was 504, 1296, 2232 and 4032 for economic, environmental, social and total sustainability reporting respectively.

Company	The state of reporting				
	Year	Economic	Environment	Social	Sustainability
All 18 selected companies	2013	187	190	423	800
	2014	213	283	518	1014
	2015	236	398	621	1255
	2016	281	476	748	1505
	2017	326	553	855	1734

Table 02 : The state of sustainability reporting in Sri Lanka of Sri Lanka

The current state of sustainability reporting in Sri Lanka can be analysed using the scores relevant for the year 2017 since the latest publicly available sustainability information are for the financial year 2017/2018 (2017). Therefore, the current state of sustainability reporting in Sri Lanka can be identified as 1734 points out of 4032 maximum possible points as illustrated by Table 02.

When analysing both the Table 01 and Table 02 it's evident that the state of sustainability reporting in Sri Lanka in Sri Lanka has not yet reached the expected level of disclosures (Senaratne & Liyanagedara (2009) and Wijesinghe (2012)).

The above identified gap between the expected state of sustainability reporting and the current state of sustainability reporting arrives from the following factors. Sustainability reporting is a voluntary disclosure practise (Hummel & Schlick (2016)) managers are given more leeway in selecting the content, type and the timing of the disclosures included in sustainability reports (Choi, Myers, Zang & Ziebart (2010)) which leads organisations to engage in selective reporting of information (Henriques (2007), MacLean & Rebernak (2007)) which hinders the completeness of the sustainability reports and creates a gap

between the expected state of sustainability reporting and the actual state of sustainability reporting.

Hence, it is palpable that the current state of sustainability reporting in Sri Lanka has not reached the expected level of sustainability reporting (Senaratne & Liyanagedara (2009) and Wijesinghe (2012)) as companies do not fully disclose the available information related to the core disclosures set out by the GRI- G4 guiding index.

4.3. The trends in sustainability reporting of Sri Lanka

The state of sustainability reporting in Sri Lanka of companies for each year were then analysed both graphically and using a percentage analysis to identify the trend of sustainability reporting of Sri Lanka for the past 5 years.

Figure 05 demonstrates the trend of sustainability reporting of the selected 18 companies for the past 5 years as a whole by plotting the state of disclosures for all the 18 companies for the past 5 years. The graphical representations for the trend analysis for the 18 individual companies that demonstrate the trend of sustainability reporting of the selected 18 companies are included as an appendix. (Appendix 02)

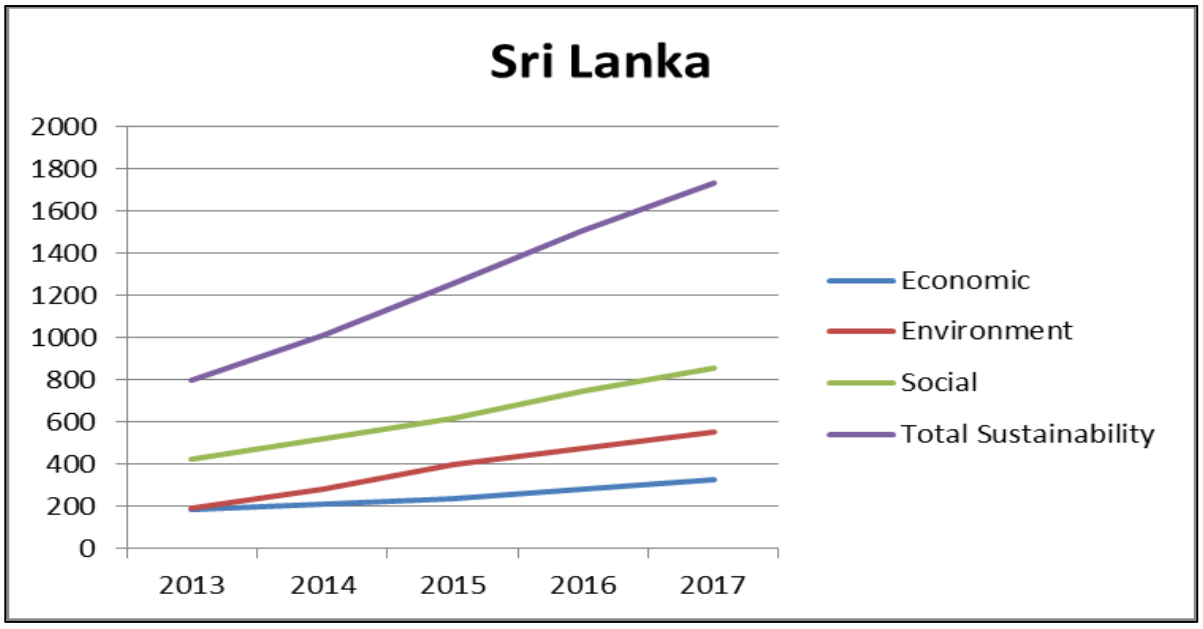

Figure 03 : The past 5 year trend in state of sustainability reporting

Table 03 analyses the trend of sustainability reporting for each individual company by comparing the state of sustainability reporting in Sri Lanka for each year as a percentage of the state of sustainability reporting in Sri Lanka of the first year under review.

Table 04 analyses the trend of sustainability reporting for all the selected 18 listed companies by comparing the state of sustainability reporting in Sri Lanka for each year as a percentage of the state of sustainability reporting in Sri Lanka of the first year under review (2013).

Company	As a percentage of state of disclosures in 2013				
	Year	Economic	Environment	Social	Sustainability
Company 1	2013	100%	100%	100%	100%
	2014	113%	120%	109%	111%
	2015	125%	120%	113%	117%
	2016	150%	220%	135%	150%
	2017	175%	280%	148%	172%
Company 2	2013	100%	100%	100%	100%
	2014	133%	111%	131%	125%
	2015	144%	133%	156%	148%
	2016	222%	167%	200%	194%
	2017	267%	194%	222%	221%
Company 3	2013	100%	100%	100%	100%
	2014	108%	116%	126%	120%
	2015	117%	126%	146%	135%
	2016	142%	153%	197%	174%
	2017	167%	184%	217%	198%
Company 4	2013	100%	100%	100%	100%
	2014	110%	100%	110%	109%
	2015	120%	143%	114%	120%
	2016	150%	186%	117%	135%
	2017	200%	214%	128%	157%
Company 5	2013	100%	100%	100%	100%
	2014	130%	136%	115%	123%
	2015	150%	145%	126%	135%

Company	As a percentage of state of disclosures in 2013				
	Year	Economic	Environment	Social	Sustainability
	2016	170%	182%	156%	165%
	2017	200%	236%	193%	204%
Company 6	2013	100%	100%	100%	100%
	2014	112%	114%	129%	119%
	2015	118%	119%	143%	127%
	2016	135%	129%	186%	151%
	2017	147%	148%	219%	173%
Company 7	2013	100%	100%	100%	100%
	2014	100%	143%	121%	120%
	2015	106%	186%	141%	142%
	2016	125%	207%	159%	161%
	2017	144%	229%	176%	180%
Company 8	2013	100%	100%	100%	100%
	2014	110%	122%	112%	116%
	2015	120%	157%	129%	140%
	2016	140%	161%	153%	154%
	2017	160%	174%	176%	172%
Company 9	2013	100%	100%	100%	100%
	2014	122%	833%	223%	260%
	2015	156%	1100%	292%	340%
	2016	189%	1233%	315%	380%
	2017	211%	1367%	377%	436%
Company 10	2013	100%	100%	100%	100%
	2014	150%	150%	156%	155%
	2015	200%	350%	219%	227%
	2016	350%	350%	281%	300%
	2017	450%	550%	350%	386%
Company 11	2013	100%	100%	100%	100%
	2014	113%	100%	100%	110%
	2015	125%	3000%	3000%	700%

Company	As a percentage of state of disclosures in 2013				
	Year	Economic	Environment	Social	Sustainability
	2016	138%	3700%	4500%	930%
	2017	163%	4700%	5400%	1140%
Company 12	2013	100%	100%	100%	100%
	2014	118%	263%	106%	133%
	2015	136%	400%	118%	165%
	2016	155%	450%	136%	188%
	2017	200%	513%	155%	219%
Company 13	2013	100%	100%	100%	100%
	2014	114%	700%	133%	155%
	2015	129%	1300%	158%	205%
	2016	157%	1600%	175%	240%
	2017	171%	1800%	217%	280%
Company 14	2013	100%	100%	100%	100%
	2014	111%	71%	111%	105%
	2015	111%	186%	121%	130%
	2016	122%	229%	132%	145%
	2017	133%	257%	150%	164%
Company 15	2013	100%	100%	100%	100%
	2014	107%	153%	121%	127%
	2015	114%	153%	129%	133%
	2016	121%	247%	158%	176%
	2017	136%	294%	175%	202%
Company 16	2013	100%	100%	100%	100%
	2014	110%	167%	116%	129%
	2015	120%	242%	132%	161%
	2016	130%	267%	163%	185%
	2017	140%	300%	189%	210%
Company 17	2013	100%	100%	100%	100%
	2014	118%	117%	135%	126%
	2015	136%	217%	157%	167%

Company	As a percentage of state of disclosures in 2013				
	Year	Economic	Environment	Social	Sustainability
	2016	155%	258%	165%	187%
	2017	173%	283%	183%	207%
Company 18	2013	100%	100%	100%	100%
	2014	108%	211%	105%	122%
	2015	117%	244%	111%	133%
	2016	125%	289%	130%	153%
	2017	133%	322%	138%	166%

Table 03 : The state of sustainability reporting as a percentage of first year of study

Company	As a percentage of state of disclosures in 2013				
	Year	Economic	Environment	Social	Sustainability
All 18 companies as a whole	2013	100%	100%	100%	100%
	2014	114%	149%	122%	127%
	2015	126%	209%	147%	157%
	2016	150%	251%	177%	188%
	2017	174%	291%	202%	217%

Table 04 : The state of sustainability reporting in Sri Lanka as a percentage of first year of study

When analysing Figure 05, Table 03 and Table 04 it is evident that there is an upward trend in sustainability reporting in Sri Lanka (Wijesinghe (2012) and that the state of economic disclosures, environmental disclosures, social disclosures have improved continuously for the last five years.

Hence, it can be assumed that the state of sustainability reporting in Sri Lanka would further improve in the future provided that this upward trend continues in the future.

4.4 The dominating disclosure category in Sri Lanka

Company	Year	As a % of state of total sustainability disclosure			
		Economic	Environment	Social	Total Sustainability
All 18 companies	2013	23%	24%	53%	100%
	2014	21%	28%	51%	100%
	2015	19%	32%	49%	100%
	2016	19%	32%	50%	100%
	2017	19%	32%	49%	100%

Table 05: The dominant disclosure category in Sri Lanka

As indicated in Table 05 majority of the sustainability reporting state is comprised of the scores obtained for social disclosures. As established in the literature review critics argue that more prominence is given to social indicators over economic and environmental indicators by Sri Lankan companies (Dissanayakea, Tilta, Lobob (2016). Hence, it is evident that organizations report on more social indicators since the GRI- GR core disclosures are more stretched towards the social indicator disclosures.

Table 06 given below analyses the weightage given to each of the key sustainability element (economic, environmental and social) under the scoring system. The scoring system is directly based on the the GRI – GR core disclosures. As depicted by Table 03 the fact that a majority of the elements included in the scoring scheme were social elements where the maximum possible score for a company per year was 220 where maximum possible scores for economic, environmental and social disclosures are 28, 68 and 124 each respectively. Therefore, it is evident that the social indicators in the GRI – G4 index are more prominent than economic and environmental disclosures and as a result Sri Lankan companies give more prominence to social indicators over economic and environmental disclosures.

Description	As a % of state of total sustainability disclosure			
	Economic	Environment	Social	Total Sustainability
Maximum possible score for a company per year	13%	31%	56%	100%

Table 06 : Weightage given to disclosure categories

4.4. Results from the statistical tests conducted

Prior to conducting the two multiple regression tests for the data a Unit root test and a Hausman test was conducted to analyse the data included in the variables.

4.4.1. Results of the unit root test

The Null hypotheses of the data series having a unit root was rejected if the probability under the ADF – Fisher Chi – square method was less than 5%.

The unit root tests conducted for all the variables gave the conclusion that the data has got unit root i.e. the data is not stationary. The data in all the variables used having unit root indicated that the variables can be used to establish relationships.

The test results of the Augmented Dickey Fuller tests conducted for each variable are included as appendix (Appendix 03).

4.4.2. Results of the Hausman test

Two separate Hausman tests were conducted to the variables included in Equation 01 and Equation 02 separately. The purpose of conducting the Hausman test was to identify which panel data model could be used to perform the regression analysis for the two equations because if a wrong model is used the generated results could be incorrect and the correct relationship between the variables could not be found out.

4.4.2.1 Hausman test conducted for Equation 01

As given in Figure 04 the probability for the Hausman test (Cross section summary) was 0.0000 which is less than 5%. Hence we accepted the alternative hypothesis which states that the most appropriate model to measure the relationship between the organizational financial performance and the state of sustainability reporting in Sri Lanka is the “Fixed Effect Model”.

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	47.699219	3	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X1	-64.669343	-22.506126	70.105757	0.0000
X2	0.000345	0.000106	0.000000	0.1777
X3	0.002762	0.001140	0.000000	0.0057

Cross-section random effects test equation:
Dependent Variable: Y
Method: Panel Least Squares
Date: 11/26/18 Time: 13:40
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	75.90245	8.168319	9.292297	0.0000
X1	-64.66934	10.80476	-5.985267	0.0000
X2	0.000345	0.000243	1.418350	0.1606
X3	0.002762	0.000943	2.928739	0.0046

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.694381	Mean dependent var	70.08889
Adjusted R-squared	0.605796	S.D. dependent var	26.03914
S.E. of regression	16.34886	Akaike info criterion	8.627156
Sum squared resid	18442.67	Schwarz criterion	9.210445
Log likelihood	-367.2220	Hannan-Quinn criter.	8.862373
F-statistic	7.838562	Durbin-Watson stat	0.782465
Prob(F-statistic)	0.000000		

Figure 04 : Hausman test results for Equation 01

This result demarcate that there is a significant difference between the data of the 18 companies but there is no significant difference between data applicable for the different time periods (from 2013 -2017) of an individual company.

Further the results indicate that the regression test for the equation should be conducted using the “Fixed Effect Model”

4.4.2.2 .Hausman test conducted for Equation 02

As given in Figure 05 the probability for the Hausman test (Cross section summary) was 0.0017 which is less than 5%. Hence we accepted the alternative hypothesis which states that the most appropriate model to measure the relationship between the organizational environmental performance and the state of sustainability reporting in Sri Lanka is the "Fixed Effect Model."

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	15.148175	3	0.0017

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X5	0.000001	0.000001	0.000000	0.0204
X6	0.001093	0.000277	0.000000	0.0202
X7	0.000000	0.000000	0.000000	0.2204

Cross-section random effects test equation:
Dependent Variable: Y
Method: Panel Least Squares
Date: 11/22/18 Time: 11:04
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	43.86130	7.128578	6.152882	0.0000
X5	1.08E-06	3.07E-07	3.526618	0.0008
X6	0.001093	0.000377	2.897176	0.0050
X7	1.17E-10	5.49E-11	2.128219	0.0369

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.554260	Mean dependent var	70.08889
Adjusted R-squared	0.425060	S.D. dependent var	26.03914
S.E. of regression	19.74413	Akaike info criterion	9.004553
Sum squared resid	26898.31	Schwarz criterion	9.587842
Log likelihood	-384.2049	Hannan-Quinn criter.	9.239769
F-statistic	4.289939	Durbin-Watson stat	1.055239
Prob(F-statistic)	0.000003		

Figure 05 : Hausman test results for Equation 02

This result demarcate that there is a significant difference between the data of the 18 companies but there is no significant difference between data applicable for the different time periods (from 2013 -2017) of an individual company.

Further the results indicate that the regression test for the equation should be conducted using the "Fixed Effect Model".

4.5. The relationship between organizational financial performance and the state of sustainability reporting in Sri Lanka

As discussed under 4.4.2.1 the results of the Hausman test indicated that in order to identify the relationship between organizational financial performance and sustainability performance the regression should be conducted under the "Fixed Effect Model".

The following hypotheses were tested using the results generated from the regression test.

H_0 – There is no significant relationship between the organizational financial performance of an organization and the state of sustainability reporting in Sri Lanka.

H_1 – There is a significant relationship between the organizational financial performance of an organization and the state of sustainability reporting in Sri Lanka.

> H_01 – There is no significant relationship between Tobin Q and the state of sustainability reporting.
>
> H_11 – There is a significant relationship between Tobin Q and the state of sustainability reporting.
>
> H_02 – There is no significant relationship between Economic value and the state of sustainability reporting.
>
> H_12 – There is a significant relationship between Economic value and the state of sustainability reporting.
>
> H_03 – There is no significant relationship between Profit before Tax and the state of sustainability reporting.
>
> H_13 – There is a significant relationship between Profit Before Tax and the state of sustainability reporting.

Dependent Variable: Y
Method: Panel Least Squares
Date: 11/26/18 Time: 13:47
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	75.90245	8.168319	9.292297	0.0000
X1	-64.66934	10.80476	-5.985267	0.0000
X2	0.000345	0.000243	1.418350	0.1606
X3	0.002762	0.000943	2.928739	0.0046

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.694381	Mean dependent var	70.08889
Adjusted R-squared	0.605796	S.D. dependent var	26.03914
S.E. of regression	16.34886	Akaike info criterion	8.627156
Sum squared resid	18442.67	Schwarz criterion	9.210445
Log likelihood	-367.2220	Hannan-Quinn criter.	8.862373
F-statistic	7.838562	Durbin-Watson stat	0.782465
Prob(F-statistic)	0.000000		

Figure 06 : Regression analysis tests for equation 01

As per the results of the regression presented by Figure 06 the probabilities for X1 and X3 were lower than 5% and was greater than 5% and therefore, hypotheses $H_1 1$, $H_0 2$ and $H_1 3$ were accepted for all the variables.

Hence, it was identified that there are significant relationships between the state of sustainability reporting in Sri Lanka and Tobin Q as well as the state of sustainability reporting and Profit before Tax but there is no significant relationship between the state of sustainability reporting and Economic value generated.

As established previously the available literature gives mixed thoughts regarding the relationship between organizational financial performance and sustainability disclosures in developing countries (Dowell et al. (2000)).

Sri Lanka is a developing country with a high diffusion rate of sustainability reporting. And this study has managed to establish that there is no significant relationship between organizational financial performance and the state of sustainability disclosures in the Sri

Lankan context. The fact that there is no significant relationship between organizational financial performance and the state of sustainability reporting might be due to the fact that organizations are motivated by a large number of non-monetary factors including legitimacy, regulations and recognition (((Hasnas (1998), Donaldson and Preston (1995) and Freeman and Reed (1983)) which would encourage the organizations to engage in sustainability reporting even when the organization is not performing financially well.

4.6. The relationship between organizational environmental performance and the state of sustainability reporting in Sri Lanka

As discussed under 4.4.2.1 the results of the Hausman test indicated that in order to identify the relationship between organizational environmental performance and sustainability performance the regression should be conducted under the "Fixed Effect Model".

The following hypotheses were tested using the results generated from the regression test.

H_0 - There is no significant relationship between the state of sustainability reporting and organizational environmental performance by energy consumption, GHG emissions and water withdrawal.

H_1 - There is a significant relationship between the state of sustainability reporting and organizational financial performance by energy consumption, GHG emissions and water withdrawal.

H_04 – There is no significant relationship between Energy consumption and the state of sustainability reporting.

H_14 – There is a significant relationship between Energy consumption and the state of sustainability reporting.

H_05 – There is no significant relationship between GHG emissions and the state of sustainability reporting.

H_15 – There is a significant relationship between GHG emissions and the state of sustainability reporting.

H_06 – There is no significant relationship between Water withdrawal and the state of sustainability reporting.

$H_1$6 – There is a significant relationship between Water withdrawal and the state of sustainability reporting.

Dependent Variable: Y
Method: Panel Least Squares
Date: 11/26/18 Time: 13:55
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	43.86130	7.128578	6.152882	0.0000
X4	1.08E-06	3.07E-07	3.526618	0.0008
X5	0.001093	0.000377	2.897176	0.0050
X6	1.17E-10	5.49E-11	2.128219	0.0369

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.554260	Mean dependent var	70.08889
Adjusted R-squared	0.425060	S.D. dependent var	26.03914
S.E. of regression	19.74413	Akaike info criterion	9.004553
Sum squared resid	26898.31	Schwarz criterion	9.587842
Log likelihood	-384.2049	Hannan-Quinn criter.	9.239769
F-statistic	4.289939	Durbin-Watson stat	1.055239
Prob(F-statistic)	0.000003		

Figure 07 : Regression analysis test results for Equation 02

As indicated in Figure 07 given above the probabilities for all the variables were less than 5% and therefore, the alternative hypothesis was accepted for all the variables. In other words $H_1$4, $H_1$5 and $H_1$6 were accepted.

Hence, it was identified that there is a significant relationship between the state of sustainability reporting in Sri Lanka and organizational environmental performance in terms of energy consumption, effluents & emissions and water withdrawal. It's noteworthy to mention that higher the consumption of natural resources and higher the emissions and effluents released to the environment higher the state of sustainability disclosures are. This could be due to the fact organizations often use sustainability reporting to appear legitimate (Duchon and Drake (2009), Milne et al (2006), Deegan et al (2006) and Cho and Patten (2007)).

As established previously the available literature gives mixed thoughts regarding the relationship between organizational environmental performance and sustainability disclosures (Clarkson, Li, Richardson, & Vasvari (2008)). This research has answered the contradiction in opinions regarding the relationship between organizational environmental performance and the state of sustainability reporting in relation to the Sri Lankan context by identifying that there is a significant relationship between organizational environmental performance and sustainability reporting with regard to Sri Lanka.

Moreover, further tests were conducted to identify whether the significant relationship that exists between organizational environmental performance and the state of sustainability as established above is manipulated by the state of sustainability disclosures or not.

4.6.1 The relationship between organizational environmental performance and the state of social and economic sustainability reporting.

A regression analysis was conducted to analyse the relationship between organizational environmental performance and the state of social and economic sustainability reporting by excluding the state of environmental reporting from the state of sustainability reporting and then testing for the relationship by conducting a regression analysis based on the equation given below in Equation 03.

$$Y_1 = \beta_0 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Equation 03 : The relationship between the state of economic and social disclosures and organizational environmental performance

The variables of equation 03 are briefly described below in Figure 08.

Y1 = The state of economic and social sustainability reporting in Sri Lanka.

β0 = The intercept of the regression

β5, β6, β7 = Coefficient of variables

X5 = Total energy consumption (Kw/H)

X6 = Effluents and emissions (GHG emissions in Metric Tonne)

Figure 08 : The variables of equation 03

Prior to conducting the regression test the variables were tested for both the unit root and the data model applicable.

The unit root of data was tested by conducting the ADF test. The results of the test indicated that the data has got unit root and therefore, a relationship can be established using the data included in the variables. (Appendix 03)

The applicable data model to identify the regression was identified through conducting a Hausman test for the variables. The Hausman test revealed that the Fixed Effect model is the most appropriate to conduct the regression analysis since the company wise data is different through time but data for the same company across time is not significantly different. (Appendix 04)

The following test hypotheses were tested.

H_0 - There is no significant relationship between the state of economic and social reporting and organizational environmental performance by energy consumption, GHG emissions and water withdrawal.

H_1 - There is a significant relationship between the state of economic and social reporting and organizational financial performance by energy consumption, GHG emissions and water withdrawal.

$H_0$4 – There is no significant relationship between Energy consumption and the state of economic and social reporting.

$H_1$4 – There is a significant relationship between Energy consumption and the state of economic and social reporting.

$H_0$5 – There is no significant relationship between GHG emissions and the state of economic and social reporting.

$H_1$5 – There is a significant relationship between GHG emissions and the state of economic and social reporting.

$H_0$6 – There is no significant relationship between Water withdrawal and the state of economic and social reporting.

$H_1$6 – There is a significant relationship between Water withdrawal and the state of economic and social reporting.

Dependent Variable: Y1
Method: Panel Least Squares
Date: 11/26/18 Time: 14:08
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34.15925	4.642524	7.357903	0.0000
X4	5.94E-07	2.00E-07	2.968962	0.0041
X5	0.000630	0.000246	2.564684	0.0125
X6	5.35E-11	3.58E-11	1.497150	0.1389

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.567336	Mean dependent var	48.97778
Adjusted R-squared	0.441926	S.D. dependent var	17.21247
S.E. of regression	12.85847	Akaike info criterion	8.146846
Sum squared resid	11408.47	Schwarz criterion	8.730135
Log likelihood	-345.6081	Hannan-Quinn criter.	8.382062
F-statistic	4.523849	Durbin-Watson stat	0.858396
Prob(F-statistic)	0.000001		

Figure 09 : Regression analysis results for Equation 03

The probability was less than 5% for both X4 and X5 whereas the probability was greater than 5% for X6. Therefore, the alternative hypothesis was accepted for both X4 and X5 and the null hypothesis was accepted for X6.

Hence, it was identified that there are significant relationship between the state of economic and social reporting and Energy consumption and between the state of economic and social reporting and GHG emissions. But there is no significant relationship between the state of economic and social disclosure and water withdrawal.

4.6.2 The relationship between organizational environmental performance and the state of social disclosures.

Prior to conducting the regression test the variables were tested for both the unit root and the data model applicable.

The unit root of data was tested by conducting the ADF test. The results of the test indicated that the data has got unit root and therefore, a relationship can be established using the data included in the variables. (Appendix 03)

The applicable data model to identify the regression was identified through conducting a Hausman test for the variables. The Hausman test revealed that the Fixed Effect model is the most appropriate to conduct the regression analysis since the company wise data is different through time but data for the same company across time is not significantly different. (Appendix 05)

The following test hypotheses were tested.

H_0 - There is no significant relationship between the state of social reporting and organizational environmental performance by energy consumption, GHG emissions and water withdrawal.

H_1 - There is a significant relationship between the state of social reporting and organizational financial performance by energy consumption, GHG emissions and water withdrawal.

> $H_0$4 – There is no significant relationship between Energy consumption and the state of social reporting.
>
> $H_1$4 – There is a significant relationship between Energy consumption and the state of social reporting.
>
> $H_0$5 – There is no significant relationship between GHG emissions and the state of social reporting.

$H_1$5 – There is a significant relationship between GHG emissions and the state of social reporting.

$H_0$6 – There is no significant relationship between Water withdrawal and the state of social reporting.

$H_1$6 – There is a significant relationship between Water withdrawal and the state of social reporting.

$$Y_2 = \beta_0 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Equation 04: The relationship between the environmental performance and the state of social reporting

Y2 = The state of social sustainability reporting in Sri Lanka.

β0 = The intercept of the regression

β5, β6, β7 = Coefficient of variables

X5 = Total energy consumption (Kw/H)

X6 = Effluents and emissions (GHG emissions in Metric Tonne)

X7 = Total water withdrawal (Litres)

Figure 10 : variables in Equation 04

As demarcated by Figure 11 the probability was less than 5% for both X4 and X5 whereas the probability was greater than 5% for X6. Therefore, the alternative hypothesis was accepted for both X4 and X5 and the null hypothesis was accepted for X6.

Hence, it was identified that there are significant relationship between the state of economic and social reporting and Energy consumption and between the state of social reporting and GHG emissions. But there is no significant relationship between the state of social disclosure and water withdrawal.

Dependent Variable: Y2
Method: Panel Least Squares
Date: 11/26/18 Time: 14:26
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23.16064	3.565627	6.495532	0.0000
X4	5.56E-07	1.54E-07	3.618990	0.0006
X5	0.000491	0.000189	2.603372	0.0113
X6	4.17E-11	2.75E-11	1.518472	0.1335

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.618599	Mean dependent var	35.16667
Adjusted R-squared	0.508048	S.D. dependent var	14.08023
S.E. of regression	9.875768	Akaike info criterion	7.619009
Sum squared resid	6729.625	Schwarz criterion	8.202298
Log likelihood	-321.8554	Hannan-Quinn criter.	7.854225
F-statistic	5.595604	Durbin-Watson stat	0.969068
Prob(F-statistic)	0.000000		

Figure 11: Regression results for Equation 04

4.6.3 The relationship between organizational environmental performance and the state of economic disclosures.

Prior to conducting the regression test the variables were tested for both the unit root and the data model applicable.

The unit root of data was tested by conducting the ADF test. The results of the test indicated that the data has got unit root and therefore, a relationship can be established using the data included in the variables. (Appendix 03)

The applicable data model to identify the regression was identified through conducting a Hausman test for the variables. The Hausman test revealed that the Random Effect model is the most appropriate to conduct the regression analysis since both the company wise data is and data for the same company across time are significantly different. (Appendix 06)

The following test hypotheses were tested.

H_0 - There is no significant relationship between the state of economic reporting and organizational environmental performance by energy consumption, GHG emissions and water withdrawal.

H_1 - There is a significant relationship between the state of economic reporting and organizational financial performance by energy consumption, GHG emissions and water withdrawal.

H_04 – There is no significant relationship between Energy consumption and the state of economic reporting.

H_14 – There is a significant relationship between Energy consumption and the state of economic reporting.

H_05 – There is no significant relationship between GHG emissions and the state of economic reporting.

H_15 – There is a significant relationship between GHG emissions and the state of economic reporting.

H_06 – There is no significant relationship between Water withdrawal and the state of economic reporting.

H_16 – There is a significant relationship between Water withdrawal and the state of economic reporting.

$$\mathbf{Y_3 = \beta_0 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6}$$

Equation 05: The relationship between the environmental performance and the state of social reporting

Y3 = The state of economic sustainability reporting in Sri Lanka.

β0 = The intercept of the regression

β5, β6, β7 = Coefficient of variables

X5 = Total energy consumption (Kw/H)

X6 = Effluents and emissions (GHG emissions in Metric Tonne)

X7 = Total water withdrawal (Litres)

Dependent Variable: Y3
Method: Panel EGLS (Cross-section random effects)
Date: 11/26/18 Time: 14:46
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.24201	0.905973	14.61634	0.0000
X4	9.35E-09	3.91E-08	0.239172	0.8115
X5	2.33E-05	2.51E-05	0.926971	0.3565
X6	9.51E-12	8.06E-12	1.179794	0.2413

Effects Specification	S.D.	Rho
Cross-section random	2.836477	0.4241
Idiosyncratic random	3.305429	0.5759

Weighted Statistics

R-squared	0.026712	Mean dependent var	6.382888
Adjusted R-squared	-0.007240	S.D. dependent var	3.355875
S.E. of regression	3.368001	Sum squared resid	975.5351
F-statistic	0.786765	Durbin-Watson stat	0.479802
Prob(F-statistic)	0.504536		

Unweighted Statistics

R-squared	0.003899	Mean dependent var	13.81111
Sum squared resid	1627.419	Durbin-Watson stat	0.287611

Figure 14: Regression results for Equation 05

As demarcated by Figure 13 the probability was greater than 5% . Therefore, the null hypothesis was accepted for all the variables.

Hence, it was identified that there are no significant relationships between the state of social disclosure and energy consumption, GHG emissions and water withdrawal.

4.6.4 The relationship between organizational environmental performance and the state of environmental disclosures.

Prior to conducting the regression test the variables were tested for both the unit root and the data model applicable.

The unit root of data was tested by conducting the ADF test. The results of the test indicated that the data has got unit root and therefore, a relationship can be established using the data included in the variables. (Appendix 03)

The applicable data model to identify the regression was identified through conducting a Hausman test for the variables. The Hausman test revealed that the Fixed Effect model is the most appropriate to conduct the regression analysis since the company wise data is different through time but data for the same company across time is not significantly different. (Appendix 07)

The following test hypotheses were tested.

H_0 - There is no significant relationship between the state of environmental reporting and organizational environmental performance by energy consumption, GHG emissions and water withdrawal.

H_1 - There is a significant relationship between the state of environmental reporting and organizational financial performance by energy consumption, GHG emissions and water withdrawal.

> $H_0$4 – There is no significant relationship between Energy consumption and the state of environmental reporting.
>
> $H_1$4 – There is a significant relationship between Energy consumption and the state of environmental reporting.
>
> $H_0$5 – There is no significant relationship between GHG emissions and the state of environmental reporting.

$H_1$5 – There is a significant relationship between GHG emissions and the state of environmental reporting.

$H_0$6 – There is no significant relationship between Water withdrawal and the state of environmental reporting.

$H_1$6 – There is a significant relationship between Water withdrawal and the state of environmental reporting.

$$Y_3 = \beta_0 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Equation 06: The relationship between the environmental performance and the state of social reporting

Y4 = The state of economic sustainability reporting in Sri Lanka.

β0 = The intercept of the regression

β5, β6, β7 = Coefficient of variables

X5 = Total energy consumption (Kw/H)

X6 = Effluents and emissions (GHG emissions in Metric Tonne)

X7 = Total water withdrawal (Litres)

Figure 15 : The variables of equation 06

Dependent Variable: Y4
Method: Panel Least Squares
Date: 11/26/18 Time: 15:01
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.702049	2.853306	3.400283	0.0011
X4	4.89E-07	1.23E-07	3.980047	0.0002
X5	0.000463	0.000151	3.065265	0.0031
X6	6.33E-11	2.20E-11	2.881086	0.0053

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.650521	Mean dependent var	21.11111
Adjusted R-squared	0.549222	S.D. dependent var	11.77070
S.E. of regression	7.902844	Akaike info criterion	7.173286
Sum squared resid	4309.391	Schwarz criterion	7.756575
Log likelihood	-301.7979	Hannan-Quinn criter.	7.408502
F-statistic	6.421829	Durbin-Watson stat	1.402758
Prob(F-statistic)	0.000000		

Figure 16 : The regression results for Equation 06

As demarcated by Figure 16 the probability was less than 5% for both X4 and X5 and greater than 5% for X6 . Therefore, the null hypothesis was accepted for all the variables. . Therefore, the alternative hypothesis was accepted for both X4 and X5 and the null hypothesis was accepted for X6.

Hence, it was identified that there are significant relationship between the state of economic and social reporting and Energy consumption and between the state of social reporting and GHG emissions. But there is no significant relationship between the state of social disclosure and water withdrawal.

4.6.5. The results from the further tests conducted.

The results from the further tests conducted as discussed by 4.6.1, 4.6.2, 4.6.3 and 4.6.4 establishes that whether the significant relationship that exists between organizational environmental performance and the state of sustainability as established under 4.6 is not manipulated by the state of sustainability disclosures.

4.7. Suggestions for future research

It is suggested that to avoid the research limitations mentioned above future research can be conducted by expanding the research sample to be more representative of industries that are not represented in the sample.

Furthermore, this study was conducted in a developing country where sustainability reporting is mandatory therefore this study can be done in a developed country where sustainability reporting is mandatory.

Moreover, the research can be further improved by incorporating a large range of variables that measure organizational financial and environmental performance to the selected few key variables used in this study.

Finally, this study can be further improved to identify the relationship between organizational social performance and the state of sustainability reporting by incorporating social performance indicators as independent variables to the regression model used.

Chapter 05 - Conclusion

The main aim of the research was to analyse the state of sustainability reporting in Sri Lanka. This aim was achieved through four research objectives and given below is the summarized conclusion of the study regarding the four objectives based on the research findings mentioned above.

The first objective was to identify the current state of sustainability reporting in Sri Lanka. This objective was achieved through the scoring of sustainability disclosures included in annual reports using a scoring system developed by Dragmoir (2010). As indicated by the research findings all the selected 18 companies as a whole only managed to obtain a score of 1734 points out of 4032 maximum points for the latest financial year with published annual reports. Hence, it can be established that there is a gap between the current state of sustainability reporting and the expected state of sustainability reporting in the Sri Lankan context. This finding is in agreement with the similar literature available for the country (Senaratne & Liyanagedara (2009) and Wijesinghe (2012)) and for the global context (Henriques (2007), MacLean & Rebernak (2007))

The second objective was to identify the trends in sustainability reporting of Sri Lanka. This objective was achieved through analysing the state of sustainability reporting through time using both a graphical analysis and a percentage analysis. As per the research findings it can be established that there is a upward trend in the state of sustainability reporting in Sri Lanka and that companies have increased both the number and the quality of their sustainability disclosures over time. This finding is in line with the available literature. (Wijesinghe (2012)

The third objective was to identify the dominating sustainability disclosure category in Sri Lanka and to identify the reasons for the dominance. This finding supports the argument created by Dissanayakea, Tilta & Lobob (2016). It was identified that social disclosures dominate economic and environmental disclosures and it was further identified that the high weightage given by the GRI – G4 core disclosures to social disclosures compared to economic and environmental disclosures.

The fourth objective was to identify whether there exists a significant relationship between organizational financial performance and the state of sustainability reporting. The research findings revealed that there are significant relationships between the state of sustainability

reporting in Sri Lanka and Tobin Q as well as the state of sustainability reporting and Profit before Tax but there is no significant relationship between the state of sustainability reporting and Economic value generated. The identified relationship supports the claim made by Shamil et al (2014) stating that sustainability reporting is influenced by firm size.

The final objective was to identify whether there exists a significant relationship between organizational environmental performance and the state of sustainability reporting. The research findings revealed that there is a significant relationship between the organizational environmental performance and the state of sustainability reporting. It was also revealed that higher the organizational impact on the environment higher the state of sustainability disclosures was. Boiral (2010)

Hence, it can be concluded that despite not having attained the expected state of sustainability reporting Sri Lanka is on a continuously improving journey to achieve there and that the financial performance do not impact on the state of sustainability reporting but environmental reporting do impact the state of sustainability reporting in the Sri Lankan context.

Chapter 06: Summary

The stakeholders became more concerned about non-financial information regarding the impact of the organization on the environment and the society with the increasing number of corporate failures, damages to the environment by corporates, exploitation of human rights and the wider society by corporations and etc. With the development of technology and improved literacy stakeholders began to request more and more non-financial information and the corporate world embraced reporting of non-financial data with open hands with the dynamic changes that took place in stakeholder's interests. Sustainability reporting came into play after several evolutions in non- financial reporting.

However, organizations adopt sustainability reporting with the objective of achieving their own personal agendas and to appear legitimate rather than with the intention of providing the actual information to the stakeholders ((Ullman (1985), Roberts (1992), Evan & Freeman (1988), Neu et al (1998)).Therefore, there exists a gap between the sustainability reporting and the sustainability performance.

The empirical evidence further suggests that even though several measures such as external assurance, social auditing, counter accounting and etc. have been implemented to improve the level of disclosures and the quality of sustainability reporting has not achieved the expected state. (Patten (1991), Laufer (2003), Dando & Swift (2003), O'Dwyer & Owen (2005) and O'Dwyer et al (2011)). Moreover, it further reveals that due to the voluntary nature of these disclosures organizations tend to selectively disclose sustainability information and therefore the current state of sustainability reporting might not be the expected state of disclosures (Sisaye (2011a), Sisaye (2011b) and O'Dwyer (2003)).

Organizations sometimes tend to engage in sustainability reporting even if they are not performing soundly both financially and environmentally. The academic world is in grey about the relationship between organizational financial performance and the state of sustainability reporting as well as the relationship between the organizational environmental performance and the state of sustainability reporting since empirical evidence gives mixed conclusions regarding the relationships (Brey & Haavaldsen (2015) and Clarkson,Li, Richardson, & Vasvari (2008.))

Hence, this study was conducted with the aim of obtaining answers to the above mentioned gaps in the literature with regard sustainability reporting in the Sri Lankan context. The first objective was to identify the current state of sustainability reporting in Sri Lanka. The second objective was to identify the trends in sustainability reporting of Sri Lanka. The third objective was to identify whether there exists a significant relationship between organizational financial performance and the state of sustainability reporting. The fourth objective was to identify whether there exists a significant relationship between organizational environmental performance and the state of sustainability reporting.

The study was conducted based on data from 18 selected listed Sri Lankan companies for the past 5 years (2013- 2017). The state of sustainability reporting was calculated by scoring the sustainability disclosures of companies using a five level ordinal scale scoring system and other data was directly extracted from the annual reports published by the respective company. Prior to conducting statistical tests the data was tested for unit root to identify the applicability of the data to measure an relationship and the Hausman test was conducted to determine the regression model to be used.

Based on the research findings it was concluded that despite not having attained the expected state of sustainability reporting Sri Lanka is on a continuously improving journey to achieve there and that the financial performance do not impact on the state of sustainability reporting but environmental reporting do impact the state of sustainability reporting in the Sri Lankan context.

The study contributed to the existing literature by identifying the current state of sustainability reporting in Sri Lanka and that there is a gap between the expected state of sustainability reporting and the current state of sustainability reporting. Furthermore, the research findings contributed to the existing literature by finding out that there is an upward trend in the state of sustainability reporting. Moreover, the research was able to provide a verdict to the contradictory opinions in the existing literature regarding both the relationship between organizational financial performance and the state of sustainability reporting and the relationship between organizational environmental performance and the state of sustainability reporting.

However, there were several limitations to the research. This research was conducted based on 18 listed Sri Lankan companies representing a range of business industries that has consecutively won awards for their sustainability reports where sustainability reporting is voluntary. Hence, the findings of this research might not be applicable to companies from countries where sustainability reporting is mandatory, companies that are not publicly listed and are not from the same industries as the companies in the sample represent.

Further, the study of the research created grounds for future research where the sample can be expanded to be more inclusive of companies ranging different industries, companies from countries with mandatory sustainability reporting and the variables used can be expanded to be inclusive of more performance indicators.

Moreover, this study can be further improved to identify the relationship between organizational social performance and the state of sustainability reporting by incorporating social performance indicators as independent variables to the regression model used.

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Appendixes

Appendix 01: Marking scheme used to calculate the state of sustainability disclosures.

Core GRI - G4 disclosure	Maximum Score
1. Economic	
1.1 Economic Performance	
1.1.1 Direct economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments.	4
1.1.2.Financial implications and other risks and opportunities for the organization's activities due to climate change.	4
1.1.3.Coverage of the organization's defined benefit plan obligations.	4
1.1.4.Significant financial assistance received from government.	4
1.2. Market Presence	
1.2.2Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation.	4
1.2.3Procedures for local hiring and proportion of senior management hired from the local community at locations of significant operation.	4
1.3. Indirect Economic impacts	
1.3.1Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement.	4
Maximum Possible Economic disclosure score	28
2. Environmental	
2.1. Material	
2.1.1Materials used by weight or volume.	4
2.1.2. Percentage of materials used that are recycled input materials.	4

Core GRI - G4 disclosure	Maximum Score
2.2 Energy	
2.2.1Direct energy consumption by primary energy source.	4
2.2.2.Indirect energy consumption by primary source.	4
2.3. Water	
2.3.1.Total water withdrawal by source.	4
2.4. Biodiversity	
2.4.1Location and size of land owned, leased, managed in, or adjacent to, protec0ted areas and areas of high biodiversity value outside protected areas.	4
2.4.2Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.	4
2.5. Emmissions, Effluents & Waste	
2.5.1.Total direct and indirect greenhouse gas emissions by weight.	4
2.5.2Other relevant indirect greenhouse gas emissions by weight.	4
2.5.4.Emissions of ozone-depleting substances by weight.	4
2.5.5.NO, SO, and other significant air emissions by type and weight.	4
2.5.6 Total water discharge by quality and destination.	4
2.5.7.Total weight of waste by type and disposal method.	4
2.5.8.Total number and volume of significant spills.	4
2.6. Products & Services	

Core GRI - G4 disclosure	Maximum Score
2.6.1.Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.	4
2.6.2.Percentage of products sold and their packaging materials that are reclaimed by category.	4
2.7.Compliance	4
2.7.1.Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with environmental laws and regulations.	4
Maximum Possible Environmental disclosure score	72
3. Social Performance Indicators	
3.1. Labour Practices & Decent Work	
3.1.1. Employment	
3.1.1.1Total workforce by employment type, employment contract, and region, broken down by gender.	4
3.1.1.2.Total number and rate of new employee hires and employee turnover by age group, gender, and region.	4
3.1.1.4. Return to work and retention rates after parental leave, by gender.	4
3.1.2. Labour / Management Relationship	
3.1.2.1Percentage of employees covered by collective bargaining agreements.	4
3.1.2.2.Minimum notice period(s) regarding operational changes, including whether it is specified in collective agreements.	4
3.1.3 Occupational Health & Safety	
3.1.3.2.Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender.	4

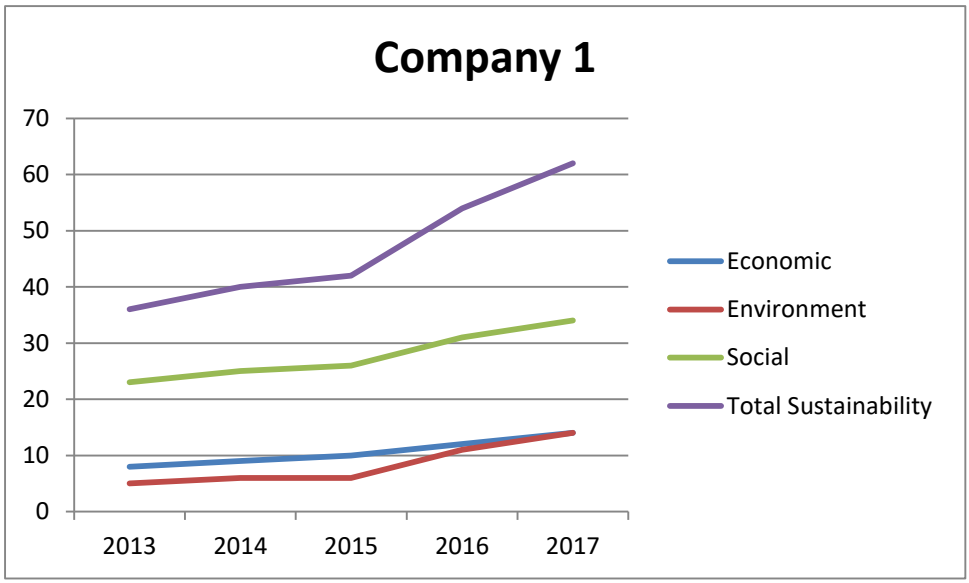
Core GRI - G4 disclosure	Maximum Score
3.1.3.3. Education, training, counselling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases.	4
3.1.4. Training & Education	
3.1.4.1. Average hours of training per year per employee by gender, and by employee category.	4
3.1.5. Diversity & Equal Opportunity	
3.1.5.1. Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity.	4
3.1.6. Equal remuneration for women & men	
3.1.6.1. Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation.	4
3.2. Human Rights	
3.2.1.Investment & Procurement Practices	
3.2.1.1. Percentage and total number of significant investment agreements and contracts that include clauses incorporating human rights concerns, or that have undergone human rights screening.	4
3.2.1.2. Percentage of significant suppliers, contractors, and other business partners that have undergone human rights screening, and actions taken.	4
3.2.1.3. Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained.	4
3.2.2. Non Discrimination	
3.2.2.1. Total number of incidents of discrimination and corrective actions taken.	4
3.2.3. Freedom of Association & Collective Bargaining	

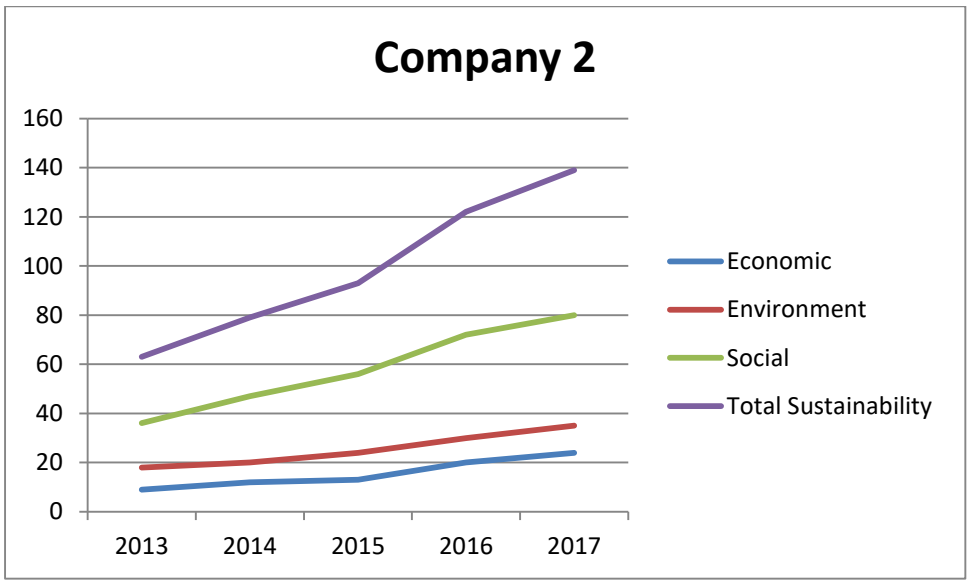
Core GRI - G4 disclosure	Maximum Score
3.2.3.1. Operations and significant suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and actions taken to support these rights.	4
3.2.4.Child Labour	
3.2.4.1. Operations and significant suppliers identified as having significant risk for incidents of child labour, and measures taken to contribute to the effective abolition of child labour.	4
3.2.5.Forced & Compulsory Labour	
3.2.5.1. Operations and significant suppliers identified as having significant risk for incidents of forced or compulsory labour, and measures to contribute to the elimination of all forms of forced or compulsory labour.	4
3.2.8. Assessment	
3.2.8.1. Percentage and total number of operations that have been subject to human rights reviews and/or impact assessments.	4
3.2.9.Remedation	
3.2.9.1. Number of grievances related to human rights filed, addressed and resolved through formal grievance mechanisms.	4
3.3. Society	
3.3.1. Local Communities	
3.3.1.1. Percentage of operations with implemented local community engagement, impact assessments, and development programs.	4
3.3.1.2. Operations with significant potential or actual negative impacts on local communities.	4
3.3.1.3. Prevention and mitigation measures implemented in operations with significant potential or actual negative impacts on local communities.	4
3.3.2. Corruption	
3.3.2.1. Percentage and total number of business units analysed for risks related to corruption.	4

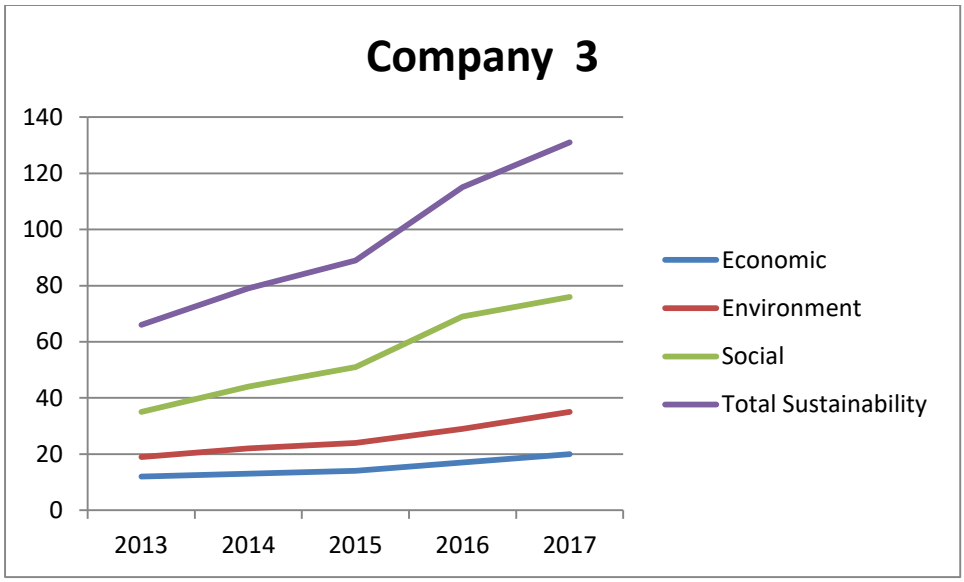
Core GRI - G4 disclosure	Maximum Score
3.3.2.2. Percentage of employees trained in organization's anti-corruption policies and procedures.	4
3.3.2.3. Actions taken in response to incidents of corruption.	4
3.3.3. Public Policy	
3.3.3.1. Public policy positions and participation in public policy development and lobbying.	4
3.3.5. Compliance	
3.3.5.1. Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with laws and regulations.	4
3.4.Product Responsibility	
3.4.1.Customer Health & Safety	
3.4.1.1Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures.	4
3.4.2. Product & Service labelling	
3.4.2.1. Type of product and service information required by procedures and percentage of significant products and services subject to such information requirements.	4
3.4.3. Marketing Communications	
3.4.3.1. Programs for adherence to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion, and sponsorship.	4
3.4.5. Compliance	
3.4.5.1. Monetary value of significant fines for noncompliance with laws and regulations concerning the provision and use of products and services.	4
Maximum Possible Social disclosure score	124
Maximum Possible score for Total Sustainability disclosures	224

Table 07 : Marking scheme used to evaluate the state of sustainability reporting

Appendix 02: Graphical representation of sustainability trend analysis for individual companies



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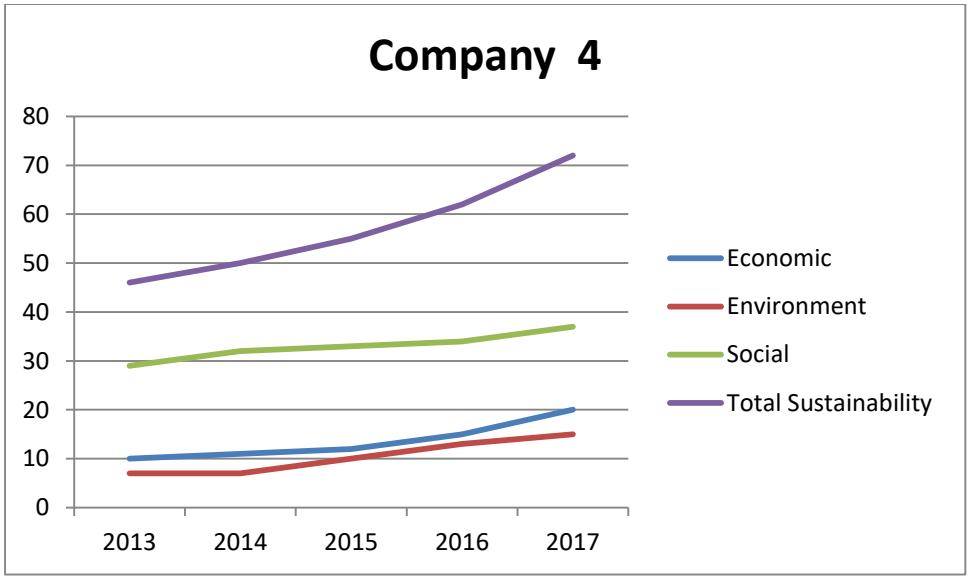
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability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2013
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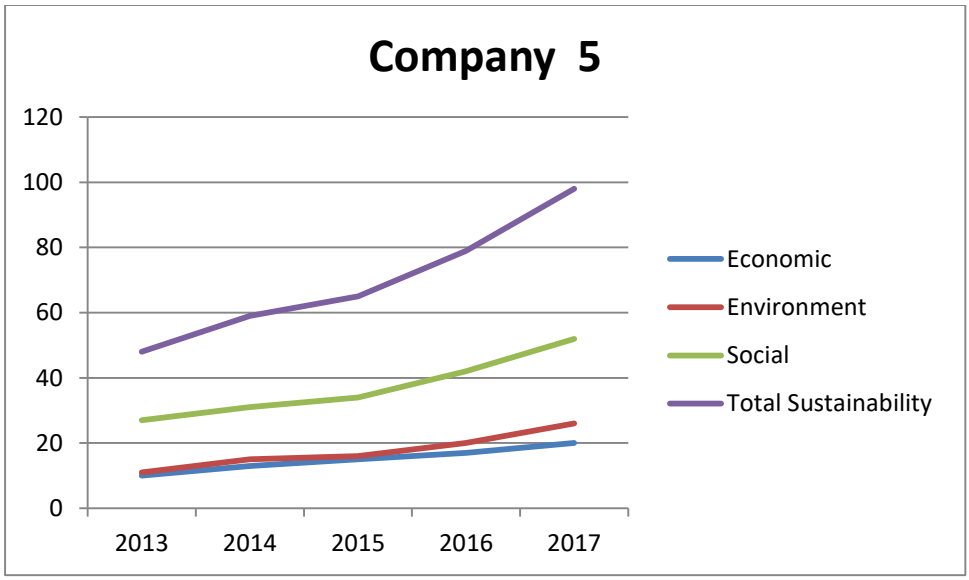
2017
Economic
Environment
Social
Total Sustainability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2013
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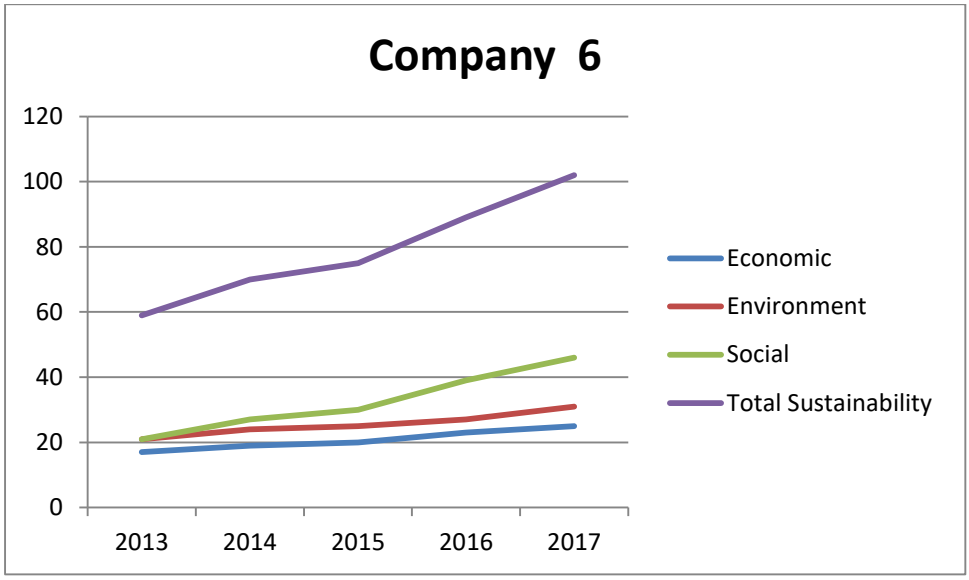
2017
Economic
Environment
Social
Total Sustainability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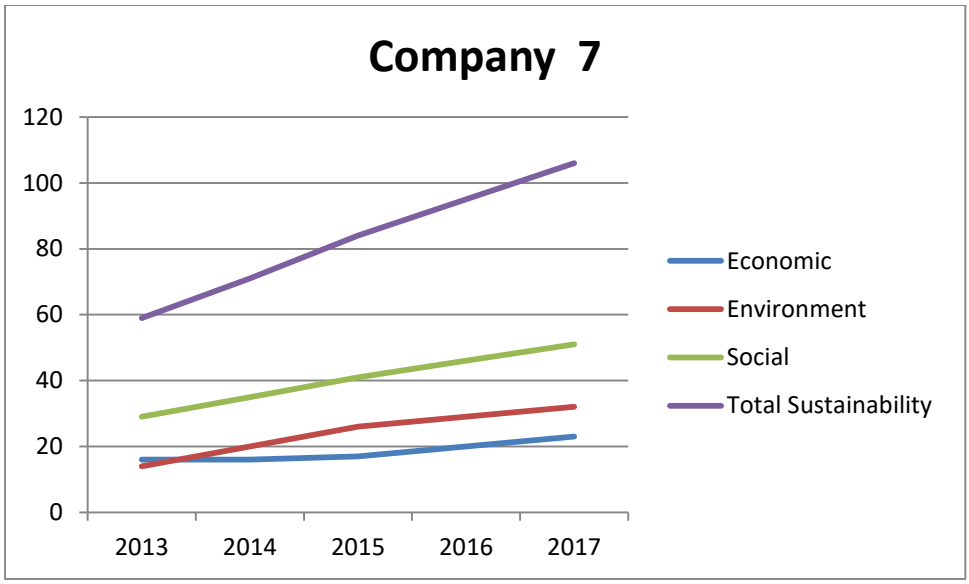
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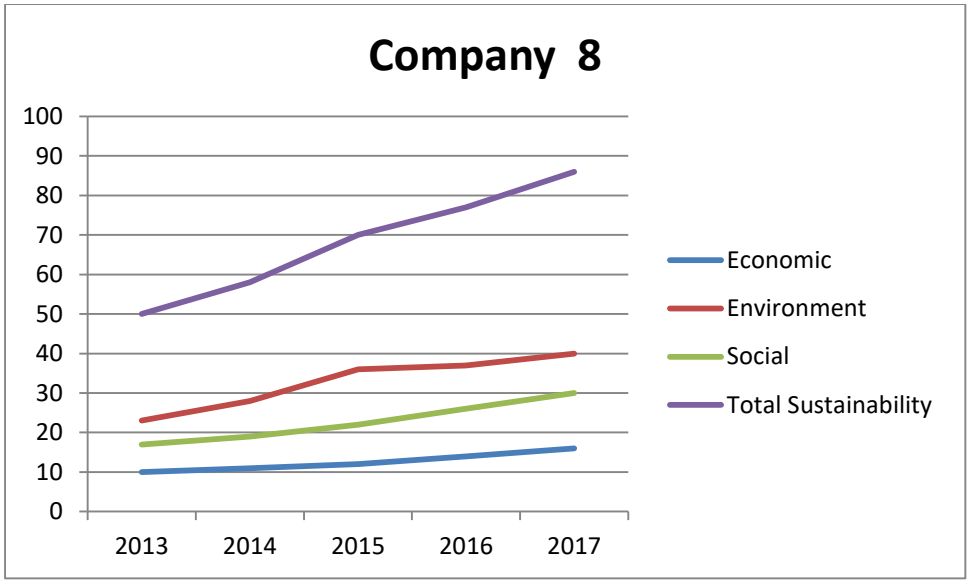
Environment
Social
Total Sustainability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Environment
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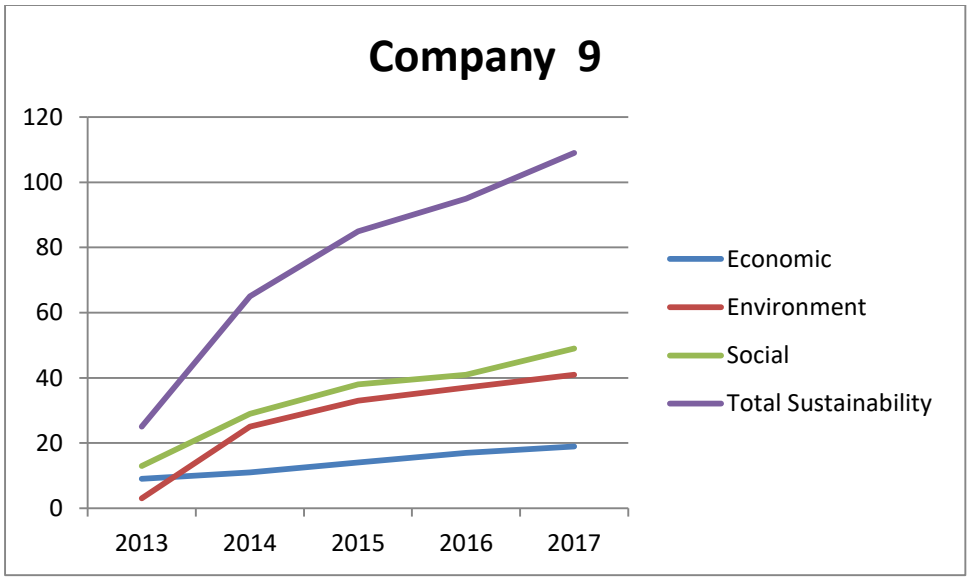
Total Sustainability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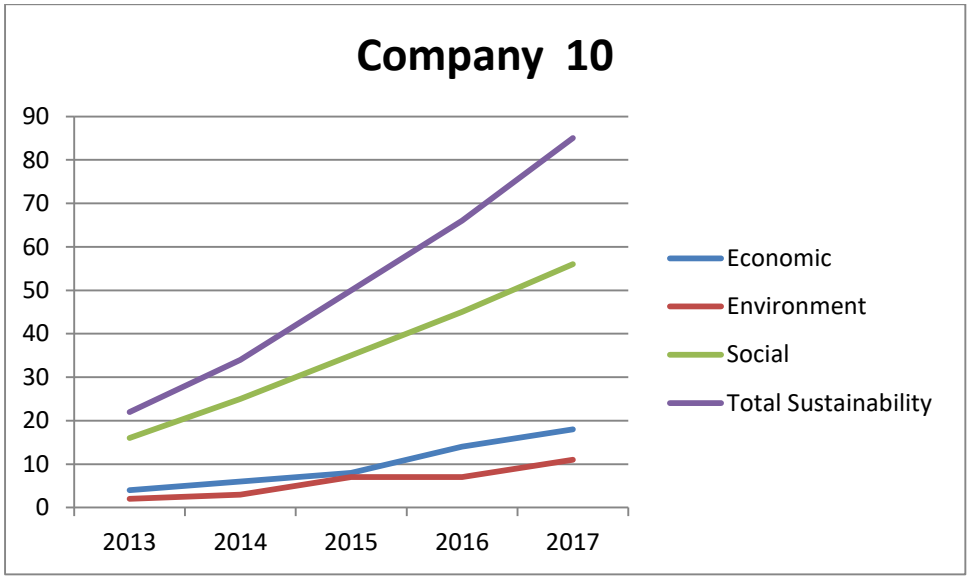
Economic
Environment
Social
Total Sustainability


Company 10
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2017
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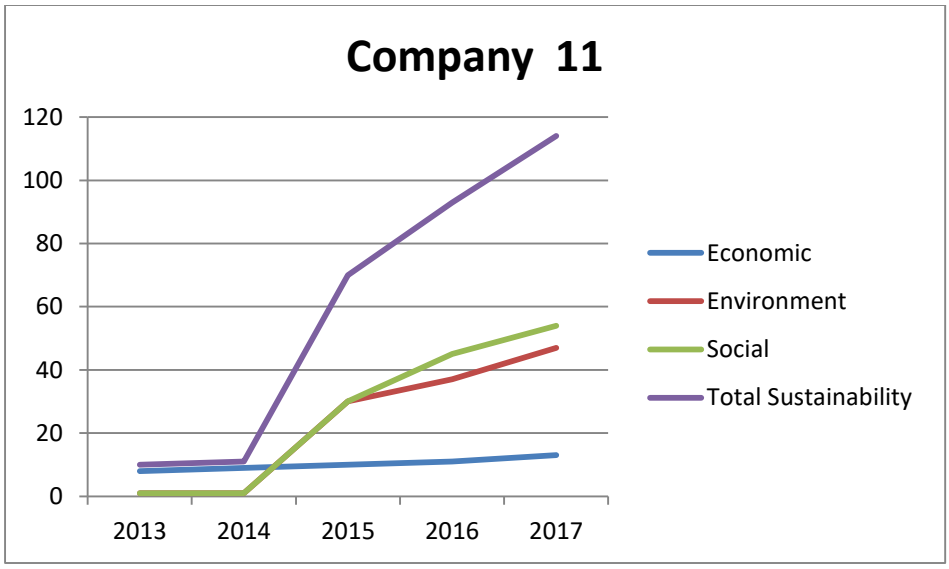
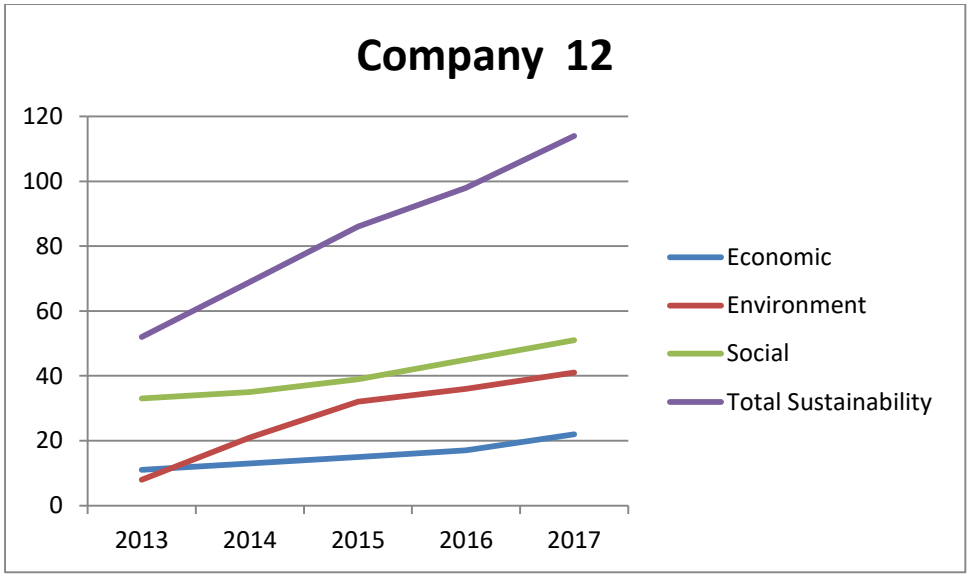
Social
Total Sustainability


Company 11
120
100
80
60
40
20
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability


Company 12
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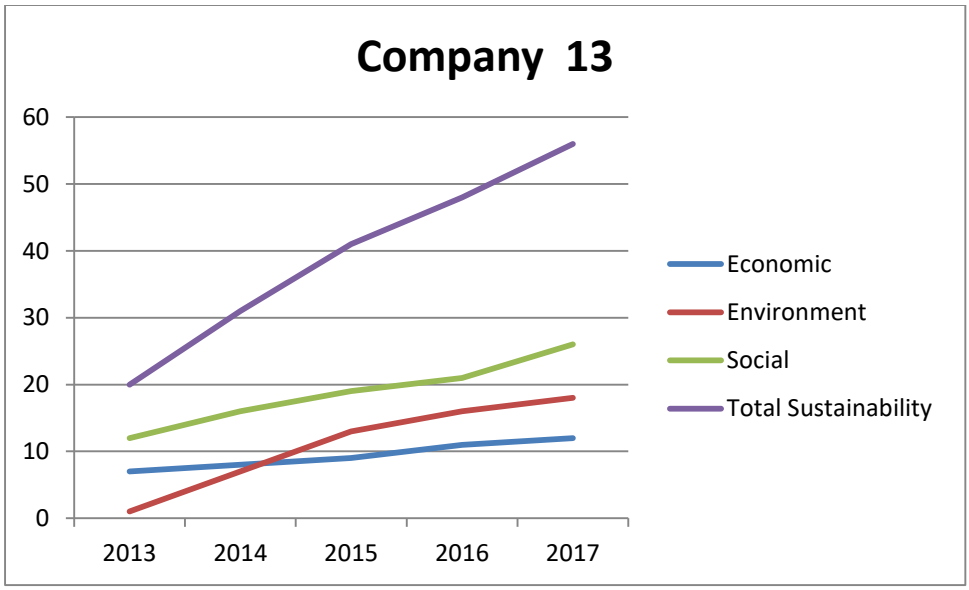
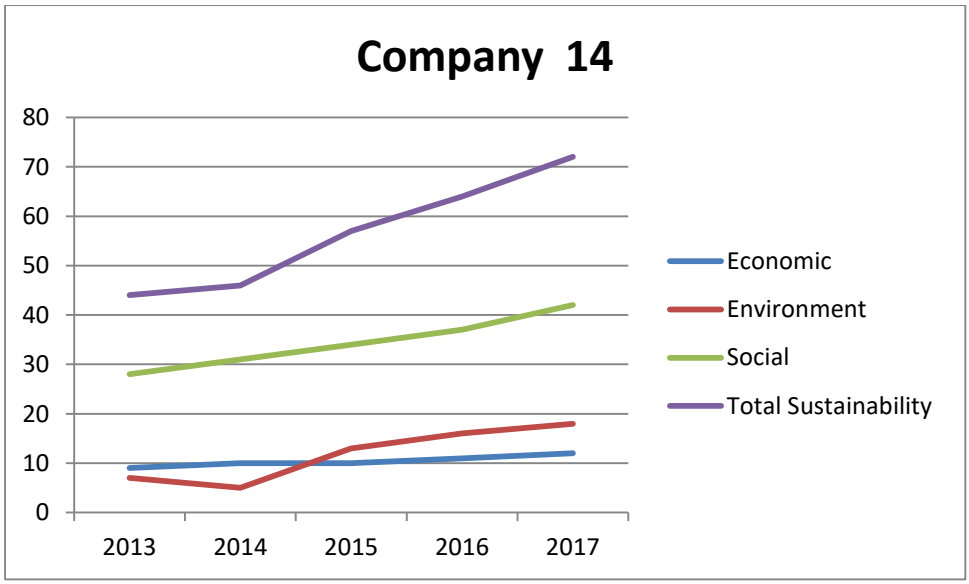
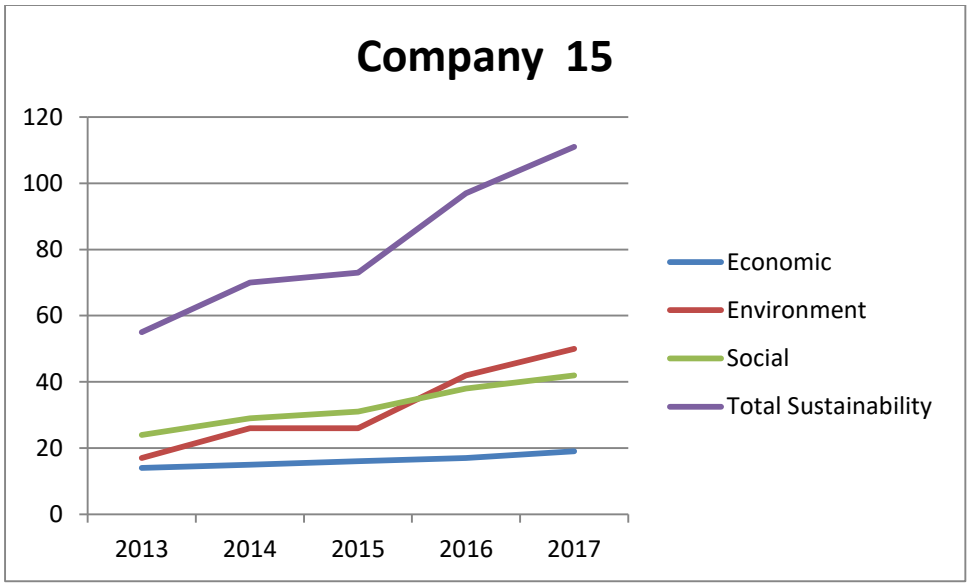
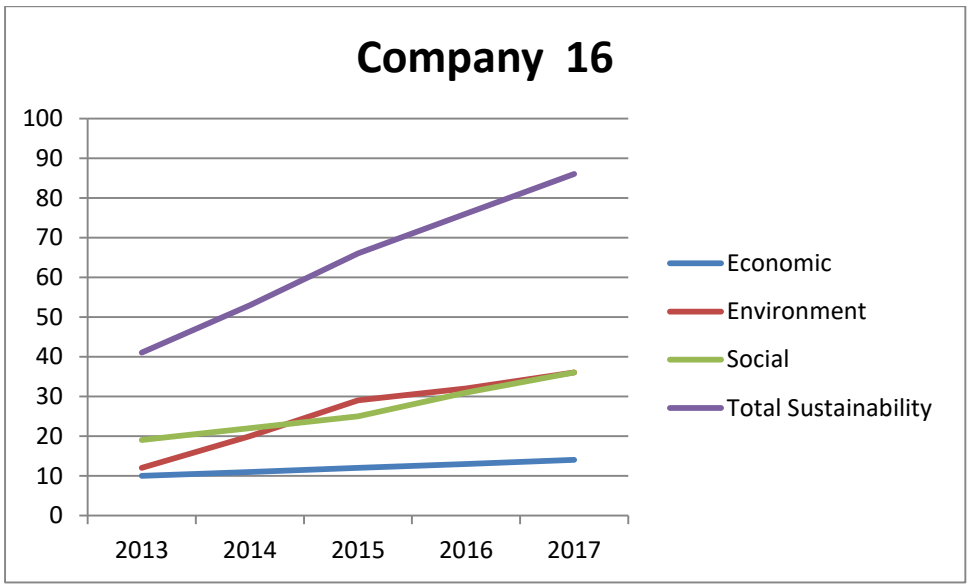
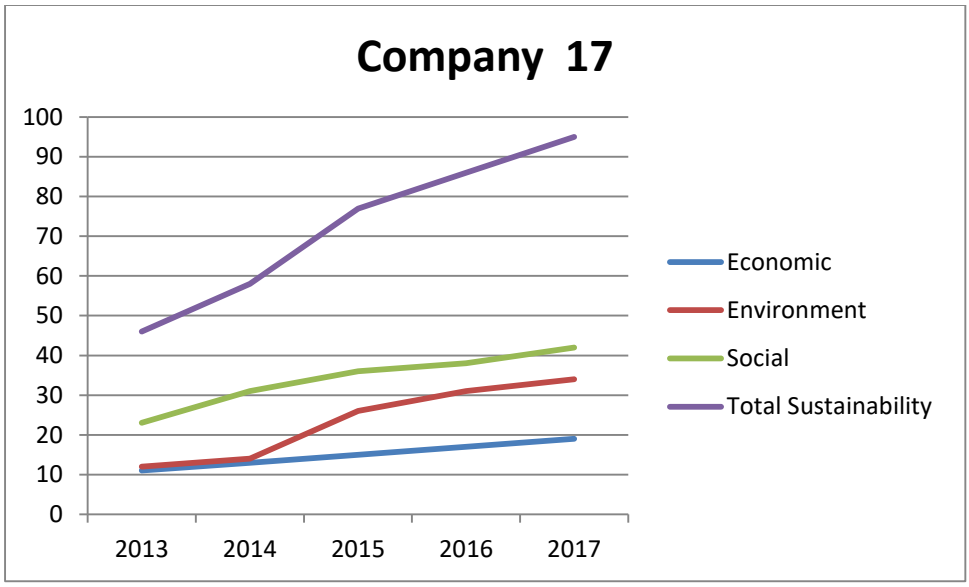
80
60
40
20
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability

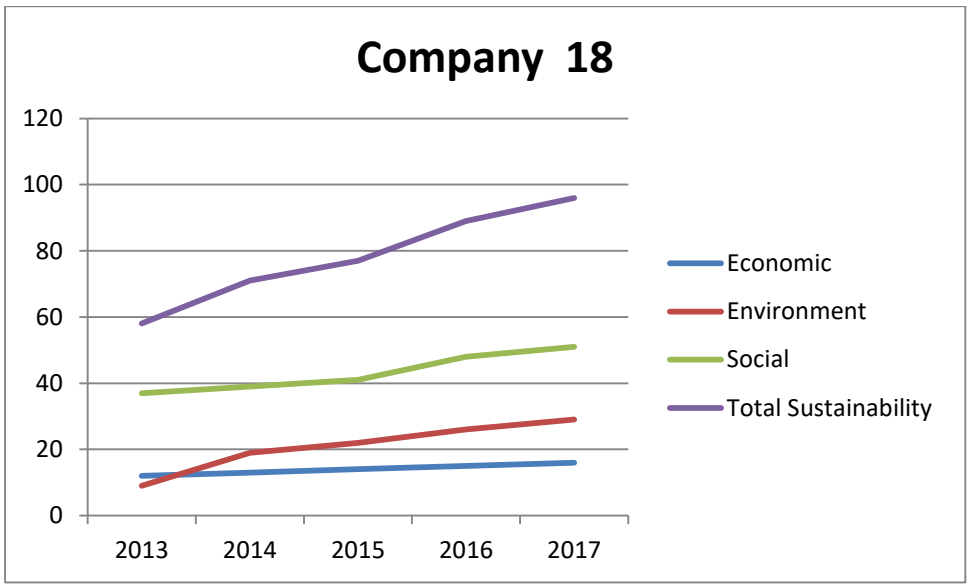

Company 13
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability


Company 14
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability


Company 15
120
100
80
60
40
20
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability


Company 16
100
90
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability


Company 17
100
90
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability


Company 18
120
100
80
60
40
20
0
2013
2014
2015
2016
2017
Economic
Environment
Social
Total Sustainability

Appendix 03: Unit root tests conducted for each variable

Hypothesis

H0- Variable has got unit root

H1- Variable is stationary

If B is less than 5% we reject null hypothesis.

Unit root tests for;

Null Hypothesis: Unit root (individual unit root process)
Series: Y
Date: 11/26/18 Time: 15:28
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	18.8475	0.9917
ADF - Choi Z-stat	4.28865	1.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results Y

Cross section	Prob.	Lag	Max Lag	Obs
1	0.9594	0	0	4
2	0.9312	0	0	4
3	0.9457	0	0	4
4	0.9999	0	0	4
5	0.9898	0	0	4
6	0.9554	0	0	4
7	0.5030	0	0	4
8	0.8300	0	0	4
9	0.0244	0	0	4
10	0.9989	0	0	4
11	0.8371	0	0	4
12	0.7010	0	0	4
13	0.1480	0	0	4
14	0.9400	0	0	4
15	0.8972	0	0	4
16	0.3328	0	0	4
17	0.6250	0	0	4
18	0.6518	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: Y1
Date: 11/26/18 Time: 15:29
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	8.69320	1.0000
ADF - Choi Z-stat	7.40012	1.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results Y1

Cross section	Prob.	Lag	Max Lag	Obs
1	0.9676	0	0	4
2	0.8915	0	0	4
3	0.9104	0	0	4
4	0.9872	0	0	4
5	0.9961	0	0	4
6	0.9443	0	0	4
7	0.9988	0	0	4
8	0.9980	0	0	4
9	0.1507	0	0	4
10	0.9955	0	0	4
11	0.8581	0	0	4
12	0.9999	0	0	4
13	0.9537	0	0	4
14	0.9881	0	0	4
15	0.9287	0	0	4
16	0.9874	0	0	4
17	0.1716	0	0	4
18	0.9334	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: Y2
Date: 11/26/18 Time: 15:30
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	14.5284	0.9994
ADF - Choi Z-stat	5.64283	1.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results Y2

Cross section	Prob.	Lag	Max Lag	Obs
1	0.9455	0	0	4
2	0.8371	0	0	4
3	0.8741	0	0	4
4	0.8064	0	0	4
5	0.9974	0	0	4
6	0.9503	0	0	4
7	0.1168	0	0	4
8	0.9976	0	0	4
9	0.1525	0	0	4
10	0.9994	0	0	4
11	0.8423	0	0	4
12	0.9964	0	0	4
13	0.9045	0	0	4
14	0.9924	0	0	4
15	0.8782	0	0	4
16	0.9859	0	0	4
17	0.1236	0	0	4
18	0.9246	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: Y3
Date: 11/26/18 Time: 15:30
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	3.06349	1.0000
ADF - Choi Z-stat	NA	

Test statistic value of 'NA' due to the present of a p-value of one or zero
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results Y3

Cross section	Prob.	Lag	Max Lag	Obs
1	0.9961	0	0	4
2	0.9325	0	0	4
3	0.9939	0	0	4
4	0.9998	0	0	4
5	0.8665	0	0	4
6	0.9250	0	0	4
7	0.9896	0	0	4
8	0.9961	0	0	4
9	0.8707	0	0	4
10	0.9681	0	0	4
11	0.9924	0	0	4
12	0.9924	0	0	4
13	0.9113	0	0	4
14	0.8901	0	0	4
15	0.9924	0	0	4
16	0.9872	0	0	4
17	0.4493	0	0	4
18	1.0000	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: Y4
Date: 11/26/18 Time: 15:31
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	39.7195	0.3078
ADF - Choi Z-stat	1.61580	0.9469

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results Y4

Cross section	Prob.	Lag	Max Lag	Obs
1	0.9421	0	0	4
2	0.9872	0	0	4
3	0.9952	0	0	4
4	0.9371	0	0	4
5	0.9664	0	0	4
6	0.9391	0	0	4
7	0.0991	0	0	4
8	0.5033	0	0	4
9	0.0021	0	0	4
10	0.8800	0	0	4
11	0.8088	0	0	4
12	0.0484	0	0	4
13	0.0689	0	0	4
14	0.8137	0	0	4
15	0.8787	0	0	4
16	0.2361	0	0	4
17	0.7811	0	0	4
18	0.0939	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: X1
Date: 11/26/18 Time: 15:31
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	48.4594	0.0803
ADF - Choi Z-stat	-0.19431	0.4230

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results X1

Cross section	Prob.	Lag	Max Lag	Obs
1	0.5091	0	0	4
2	0.9262	0	0	4
3	0.0613	0	0	4
4	0.2754	0	0	4
5	0.1404	0	0	4
6	0.3986	0	0	4
7	0.7826	0	0	4
8	0.8349	0	0	4
9	0.1700	0	0	4
10	0.7246	0	0	4
11	0.9348	0	0	4
12	0.1686	0	0	4
13	0.7430	0	0	4
14	0.9731	0	0	4
15	0.0001	0	0	4
16	0.8945	0	0	4
17	0.1435	0	0	4
18	0.5723	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: X2
Date: 11/26/18 Time: 15:31
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	38.8827	0.3412
ADF - Choi Z-stat	2.54877	0.9946

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results X2

Cross section	Prob.	Lag	Max Lag	Obs
1	0.2562	0	0	4
2	0.5037	0	0	4
3	0.9843	0	0	4
4	0.4750	0	0	4
5	0.8971	0	0	4
6	0.7763	0	0	4
7	0.9782	0	0	4
8	0.0004	0	0	4
9	0.9889	0	0	4
10	0.9976	0	0	4
11	0.6905	0	0	4
12	0.9006	0	0	4
13	0.5562	0	0	4
14	0.9947	0	0	4
15	0.3912	0	0	4
16	0.9743	0	0	4
17	0.0031	0	0	4
18	0.5637	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: X2
Date: 11/26/18 Time: 15:31
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 72
Cross-sections included: 18

Method	Statistic	Prob.**
ADF - Fisher Chi-square	38.8827	0.3412
ADF - Choi Z-stat	2.54877	0.9946

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results X2

Cross section	Prob.	Lag	Max Lag	Obs
1	0.2562	0	0	4
2	0.5037	0	0	4
3	0.9843	0	0	4
4	0.4750	0	0	4
5	0.8971	0	0	4
6	0.7763	0	0	4
7	0.9782	0	0	4
8	0.0004	0	0	4
9	0.9889	0	0	4
10	0.9976	0	0	4
11	0.6905	0	0	4
12	0.9006	0	0	4
13	0.5562	0	0	4
14	0.9947	0	0	4
15	0.3912	0	0	4
16	0.9743	0	0	4
17	0.0031	0	0	4
18	0.5637	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: X4
Date: 11/26/18 Time: 15:32
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 68
Cross-sections included: 17 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	42.2816	0.1557
ADF - Choi Z-stat	-1.08984	0.1379

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results X4

Cross section	Prob.	Lag	Max Lag	Obs
1	0.3163	0	0	4
2	0.1210	0	0	4
3	0.2002	0	0	4
4	0.0485	0	0	4
5	0.7993	0	0	4
6	0.4916	0	0	4
7	0.6965	0	0	4
8	0.4576	0	0	4
9	0.7394	0	0	4
10	0.2688	0	0	4
11	0.0030	0	0	4
12	0.2615	0	0	4
13	0.7138	0	0	4
14		Dropped from Test		
15	0.5398	0	0	4
16	0.5832	0	0	4
17	0.4771	0	0	4
18	0.8335	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: X5
Date: 11/26/18 Time: 15:32
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 64
Cross-sections included: 16 (2 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	40.7017	0.1392
ADF - Choi Z-stat	-0.27281	0.3925

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results X5

Cross section	Prob.	Lag	Max Lag	Obs
1	0.9007	0	0	4
2	0.3253	0	0	4
3	0.0023	0	0	4
4	0.9505	0	0	4
5		Dropped from Test		
6	0.2296	0	0	4
7	0.7236	0	0	4
8	0.0040	0	0	4
9	0.8480	0	0	4
10		Dropped from Test		
11	0.1400	0	0	4
12	0.6264	0	0	4
13	0.7199	0	0	4
14	0.8093	0	0	4
15	0.4265	0	0	4
16	0.5664	0	0	4
17	0.5114	0	0	4
18	0.6230	0	0	4

Null Hypothesis: Unit root (individual unit root process)
Series: X5
Date: 11/26/18 Time: 15:32
Sample: 2013 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 64
Cross-sections included: 16 (2 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	40.7017	0.1392
ADF - Choi Z-stat	-0.27281	0.3925

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results X5

Cross section	Prob.	Lag	Max Lag	Obs
1	0.9007	0	0	4
2	0.3253	0	0	4
3	0.0023	0	0	4
4	0.9505	0	0	4
5		Dropped from Test		
6	0.2296	0	0	4
7	0.7236	0	0	4
8	0.0040	0	0	4
9	0.8480	0	0	4
10		Dropped from Test		
11	0.1400	0	0	4
12	0.6264	0	0	4
13	0.7199	0	0	4
14	0.8093	0	0	4
15	0.4265	0	0	4
16	0.5664	0	0	4
17	0.5114	0	0	4
18	0.6230	0	0	4

Conclusion: All the independent variables and the dependent variables have got unit root.

Appendix 04: Hausman test result for Equation 03

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.039561	3	0.0046

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X4	0.000001	0.000000	0.000000	0.0422
X5	0.000630	0.000137	0.000000	0.0283
X6	0.000000	0.000000	0.000000	0.1867

Cross-section random effects test equation:
Dependent Variable: Y1
Method: Panel Least Squares
Date: 11/26/18 Time: 14:04
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34.15925	4.642524	7.357903	0.0000
X4	5.94E-07	2.00E-07	2.968962	0.0041
X5	0.000630	0.000246	2.564684	0.0125
X6	5.35E-11	3.58E-11	1.497150	0.1389

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.567336	Mean dependent var	48.97778
Adjusted R-squared	0.441926	S.D. dependent var	17.21247
S.E. of regression	12.85847	Akaike info criterion	8.146846
Sum squared resid	11408.47	Schwarz criterion	8.730135
Log likelihood	-345.6081	Hannan-Quinn criter.	8.382062
F-statistic	4.523849	Durbin-Watson stat	0.858396
Prob(F-statistic)	0.000001		

H0 –Random effects model is appropriate

H1 – Fixed effect model is appropriate

If B value is less than 5% we reject H0.

B value is less than 5%. So we reject H0.

Therefore**, fixed effect** model is appropriate.

Appendix 05 – Hausman test for equation 04

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.791201	3	0.0032

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X4	0.000001	0.000000	0.000000	0.0342
X5	0.000491	0.000129	0.000000	0.0329
X6	0.000000	0.000000	0.000000	0.1326

Cross-section random effects test equation:
Dependent Variable: Y2
Method: Panel Least Squares
Date: 11/26/18 Time: 14:24
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23.16064	3.565627	6.495532	0.0000
X4	5.56E-07	1.54E-07	3.618990	0.0006

H0 –Random effects model is appropriate

H1 – Fixed effect model is appropriate

If B value is less than 5% we reject H0.

B value is less than 5%. So we reject H0.

Therefore**, fixed effect** model is appropriate.

Appendix 06 – Hausman test for Equation 05

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.286773	3	0.0985

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X4	0.000000	0.000000	0.000000	0.3927
X5	0.000139	0.000023	0.000000	0.0461
X6	0.000000	0.000000	0.000000	0.5991

Cross-section random effects test equation:
Dependent Variable: Y3
Method: Panel Least Squares
Date: 11/26/18 Time: 14:41
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.99861	1.193419	9.216049	0.0000
X4	3.79E-08	5.14E-08	0.736967	0.4636
X5	0.000139	6.32E-05	2.198689	0.0313
X6	1.18E-11	9.19E-12	1.287266	0.2023

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.538567	Mean dependent var	13.81111
Adjusted R-squared	0.404818	S.D. dependent var	4.284528
S.E. of regression	3.305429	Akaike info criterion	5.429973
Sum squared resid	753.8846	Schwarz criterion	6.013262
Log likelihood	-223.3488	Hannan-Quinn criter.	5.665190
F-statistic	4.026704	Durbin-Watson stat	0.676409
Prob(F-statistic)	0.000008		

H0 –Random effects model is appropriate

H1 – Fixed effect model is appropriate

If B value is less than 5% we reject H0.

B value is greater than 5%. So we accept H0.

Therefore**, Random effect** model is appropriate.

Appendix 07 – Hausman test for Equation 06

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.852222	3	0.0126

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X4	0.000000	0.000000	0.000000	0.0721
X5	0.000463	0.000178	0.000000	0.0379
X6	0.000000	0.000000	0.000000	0.3595

Cross-section random effects test equation:
Dependent Variable: Y4
Method: Panel Least Squares
Date: 11/26/18 Time: 14:54
Sample: 2013 2017
Periods included: 5
Cross-sections included: 18
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.702049	2.853306	3.400283	0.0011
X4	4.89E-07	1.23E-07	3.980047	0.0002
X5	0.000463	0.000151	3.065265	0.0031
X6	6.33E-11	2.20E-11	2.881086	0.0053

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.650521	Mean dependent var	21.11111
Adjusted R-squared	0.549222	S.D. dependent var	11.77070
S.E. of regression	7.902844	Akaike info criterion	7.173286
Sum squared resid	4309.391	Schwarz criterion	7.756575
Log likelihood	-301.7979	Hannan-Quinn criter.	7.408502
F-statistic	6.421829	Durbin-Watson stat	1.402758
Prob(F-statistic)	0.000000		

H0 –Random effects model is appropriate

H1 – Fixed effect model is appropriate

If B value is less than 5% we reject H0.

B value is less than 5%. So we reject H0.

Therefore**, Fixed effect** model is appropriate.