Sustainability Reporting and Disclosure in Auto Component Manufacturing Sector in the World and in Canada

by

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Author Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

The worldwide framework for Sustainable Development Goals (SDGs) focuses on how to integrate sustainability in both the public and commercial sphere. Sustainability in the auto components manufacturing sector is critically important considering the sheer size of the sector worldwide: three trillion USD. In 2018, 35 billion CAD in auto parts were shipped in 2018 to the large manufacturing firms, and a portion to parts resellers, in Canada and abroad. Over 100,000 people were employed in this sector in Canada, thus representing an important economic contributor to the economy. If sustainability can be effectively integrated into this sector, it could be a model for other Canadian sectors looking to retool and thrive in the uncertain world economy being pushed towards developing sustainability. This study focuses on the reward, cost, and potential benefits of integrating sustainability disclosure and reporting.

This study sought to identify how the auto components manufacturing sector can integrate certain important targets within the SDG framework. More specifically, targets within SDG 9, "Innovation, Industry and Infrastructure" and SDG 12 "Ensure sustainable consumption and production patterns" were explored.

The first part of this study developed an outline of the worldwide auto components sector and the potential impact on sustainability as can be drawn from a sample of companies. The study examined the level of disclosure undertaken by a representative sample of publicly listed companies. The disclosure was also classified based on whether the company followed Global Reporting Initiative standards or not. The study related key financial metrics with the levels of disclosures. The second part of the study sought to use some key conclusions from the quantitative study to develop an understanding of the level of three Canadian companies in the sample – Linamar, Magna and Martinrea. The study used Lozano's CIVIS model to define the breadth and efficiency of sustainability initiatives.

The study pointed to some reasonably verified conclusions. The auto components manufacturing sector has sustainability disclosure mechanisms based on firm size and net income. Undertaking

sustainability disclosure annually has had no discernable impact on operational expenses. Companies do not seem to have reaped significant cost savings benefits from undertaking systemic sustainability disclosures. There are no discernable differences in investment decisions related to sustainability which might indicate an increasing trend towards outsourcing key production rather invest in companywide modifications other than what would be necessary to respond to market changes. The three Canadian companies studied have not engaged in consistent undertaking of sustainability disclosures. They may even be undertaking redundant measures to develop sustainability. This could mean that tight economic conditions could cause them to reduce or curtail sustainability initiatives. The study conducted contributes to an understanding of the development of sustainability in the auto component manufacturing sector by explaining what factors are very likely to dissuade companies from undertaking detailed disclosure and reporting. The study showed that institutional theory must look at the development of internal flexibility to integrate effective sustainability reporting rewarding more than financial performance. Conversely, stakeholder theory can be expanded to develop an understanding of financing sources that can and are willing to accept returns that go beyond monetary values especially in how reporting is undertaken.

Key words: GRI; Sustainability Disclosure; Auto Parts; Impact; Financial Metrics; SDGs

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Chapter 1 Introduction to study

A company is as strong as the weakest point in its value chain as a disruption at one point of production can affect the final product in ways not foreseen until a crisis arises (Stonebraker, Goldhar, & Nassos, 2009). As far back as 2009, analysts were commenting, if not outright warning, about the risks that companies had decided to take on for budget efficiency (B. Powell, 2011; Stonebraker et al., 2009). The need for a better quarterly report to shareholders, private or public, outweighed the importance of a resilient and reliable supply chain that contributed to the security and quality of components to be used in further value creation. The last two decades have shown this conflict between short term financial performance and long term institutional adversely affects companies when they are least prepared for a crisis, a situation particularly true in the middle of a global pandemic (O'Leary, 2020; Stonebraker et al., 2009).

The three parts of this introductory chapter will provide context for the study outlining the current problems related to the impact of and reporting on sustainability initiatives undertaken by key players in the auto component manufacturing sector. The first part deals with key issues with the sector developing an understanding of the fragility related to a purely economically efficient supply chain. The second part will deal with the key role that technology has played in developing supply chains across global boundaries and the resulting pressures that are slowly becoming untenable for key players in the sector. The third will outline key points of the study by chapter.

1.1 The 21st Century Supply Chain: Efficiency at the cost of fragility

Companies are now asking themselves if weaning off reliance on a few suppliers to alleviate supply chain risk is worth the investment and effort required to develop redundancies in the supply chain system. Many are pushing towards sustainability in the value chain leaving supplier companies with a number of critical decisions to make (Gimenez, Sierra, & Rodon, 2012; Sara & Stephan, 2016).

The auto sector has previous examples of situations where disruptions of the supply chain seriously affected the availability of finished products to bring to consumers. Lovers of red-colored sports cars were bereaved for a while in 2011 because the factory that produced a key component – Xirallic – was forced to go offline because of an earthquake, tsunami and, in a trifecta of disasters, a nuclear plant meltdown in Fukushima (Seetharaman, 2011). Most significant studies of the trends in corporate strategy in the auto sector over the last 10 years has shown that a significant number of component companies have consolidated by either being acquired or acquiring rival companies where possible. This is particularly true for Canada and specifically Ontario which is home to the majority of direct auto manufacturing jobs according to Canadian Vehicle Manufacturer's Association (CVMA, 2019; Global Affairs Canada, 2018; Hatges & Brown, 2019). The supply base has become smaller, the companies more "efficient" – lower number of employees, higher levels of automation or outsourcing – and the key players in the auto manufacturing sector becoming more powerful in dictating the terms of contractual obligations (Holmes, Rutherford, & Carey, 2017). The additional complication that affects companies is the need for environmental sustainability not just because of regulatory enforcement but also because of significant awareness of the community in which they operate. This is on top of the expectations from their key buyers even independent of the new framework for Sustainable Development Goals as set out in 2015 (Lacoste, 2016).

1.2 Evolution of pressures on the supply chain: correlation with developments in information technology

The evolution of the supply chain has become possible because of the adaptation of information technology that is commercially available for the last 20 years. Three critical parts of the framework of information flow has become important in developing this "efficient" supply chain – a efficient data collection system, a very rapid data transmission system and a very user-friendly interface with which to access usable versions of the data (Braunscheidel & Suresh, 2009; Tarn, Yen, & Beaumont, 2002). With costs of adaptation of supply chain management technology going down and low barriers to use of such systems, this ironically may be the very reason why the negative aspects are more prevalent.

Initially, the availability of technology enabled a lot of smaller companies to be able to reach large auto companies. Through the beginning of the 21st century, many smaller companies invested in and developed innovative technical solutions both in manufacturing and in the mechanisms with which to develop relationships with buyers (Buffington, 2016). This was a game changer compared to the fragmented and inefficient nature of relationship development across boundaries even in the late 20th century. The role of the internet and the development of websites like Alibaba in developing a very efficient B2B market cannot be overstated (Aláez-Aller & Longás-García, 2010; Pohludka, Stverkova, & Ślusarczyk, 2018). With China and India becoming key points for offshore manufacturing and support services in the late 1990s and early 2000s, the development of web-based merchandising and service portals only accelerated the trend. The transactional information exchange was made much more efficient (Raven, Huang, & Kim, 2007). This led to the increased market share of various firms and made the playing field level in many aspects for smaller firms that could now compete on a global scale.

Many studies and articles focus on what happened next as a lesson in unintended consequences (Huang, Nijs, Hansen, & Anderson, 2012; Tarn et al., 2002). The increased competition, while a boon for the purchasing consumers and companies, became an issue for sellers of the myriad items available. This was first apparent in the consumer focused sectors where information was inherently available and was leveraged to extract further reductions in prices from producers, especially by large conglomerates like Wal-Mart (Huang et al., 2012). This had significant downward pressure on operating income margins and led to many smaller companies persisting on precarious financial conditions. The smallest movement that went against the company's competitive advantages could tilt them over into bankruptcy. This problem was particularly acute in the auto parts manufacturing sector. The overall auto manufacturing sector tends to be very hard hit when any major crisis happens of which there were many in the first decade of the new century. The dot com crash at the end of the 20th and beginning of the 21st centuries, then 9/11, and then the 2008 financial crisis all led to serious declines in the consumer spending on various vehicles (Platt & Platt, 2013). Even before the consistent decline in purchase of vehicles, one major problem faced by suppliers of auto components was the consolidation of the sector worldwide. This led to fewer choices when making strategic decisions about partnerships to develop for selling their products (Bailey, De Ruyter, Michie, & Tyler, 2010; Pavlínek, 2015). Information technology played a role throughout all this by significantly shortening the response time needed to avoid market failure on the part of the companies competing for the same component space in various types of vehicles. And then the pressure came to develop sustainable vehicles both in terms of social impact and environmental footprint.

In summary, the rapid evolution of technology and the development of markets in every corner of the world for auto components has led to the need for understanding how sustainability can be integrated into the industry in a very dynamic and cost effective manner. The aim of this thesis is to develop an understanding of the factors that could detract from or enhance the adaptation of regular sustainability reporting that is timely, relevant, and actionable by management and shareholders. The key contribution

of the thesis is to provide an overview of what could be the appropriate political and market pressures and incentives that can be exerted in this B2B (Business to Business) sector that can make up for key shortfalls in the legal and commercial framework which detract from effective sustainability reporting.

1.3 Thesis structure

This section outlines the structure of the thesis. The following are the chapters in the thesis and key points from the respective chapters:

- **Chapter 1 – Introduction to study:** Provides an introduction and brief overview of the auto component manufacturing sector and the effects of technology on supply chain businesses
- **Chapter 2 – Background:** This chapter looks at the context that this sector can play within the overall aim of developing a sustainable world. This chapter then summarizes the specific SDG goals that could be achieved by developing sustainability in the auto component manufacturing sector. This chapter also highlights the issues companies in the sector could face due to the pressures because of developing sustainability.
- **Chapter 3 – Review of Literature:** This chapter highlights the two key theoretical frameworks underpinning the study – stakeholder theory and institutional theory – and how they intersect to provide the underlying key data points selected. Stakeholder theory and its implications on the development of companywide initiatives related to sustainability are discussed. A key part of the understanding of the application of stakeholder theory is the evolution of literature towards understanding sustainability in B2B sectors. Various literature is highlighted that explains how stakeholder theory is as relevant in B2B sectors as it is in B2C sectors such as fashion and food. Institutional theory is then outlined which helps understand the need for dispersal of

sustainability related information in the form of website sections and in the annual report. The key information gap identified is identifying whether developing and disclosing sustainability is itself feasible for the auto component manufacturing companies considering the contradictory pressures on them – long term impact versus short term financial benefits. The relevant insights from literature supporting the importance of analyzing and explaining this aspect is explained in this chapter.

- **Chapter 4 – Methodology:** This chapter looks at the process of the selection of sample and the identification of key analytical tools. This chapter provides an overview of the reasoning behind the selection of the sample, the analytical tools, and potential conclusions to be drawn. This chapter ends with a description of key limitations of the analytical mechanisms.
- **Chapter 5 – Findings:** This chapter outlines the findings of the analysis as divided into the sector wide analysis, quantitative study, and the qualitative study of three key Canadian Ontario based companies.
- **Chapter 6 – Discussion:** This chapter relates the critical findings in the fifth chapter with key points drawn from the literature to provide an overview of the likely state of sustainability disclosure and reporting with potential consequences for the sector. This chapter seeks to develop key conclusions that can help draw important insights both towards the state of sustainability and the potential strategic direction that the sector could be heading towards. Then the analysis of three key Canadian Ontario based auto component manufacturing companies help to develop an in-depth picture of sustainability reporting and disclosure in Canada within the context of the overall worldwide state of the sector.
- **Chapter 7 – Key conclusions and directions for further research:** This chapter seeks to provide an understanding of the areas of priority that should be examined for further understanding how to develop better sustainability measures and disclosure mechanisms in this sector.

Chapter 2 Background

The Sustainable Development Goals (SDGs) were established on 25th September 2015 as a follow up to the Millennium Development Goals to implement a more comprehensive and lasting development of human life within context of a planet with limited and rapidly depleting resources (Sachs, 2012). There are 17 goals and 169 targets that are in the framework which seek to develop a comprehensive enhancement of human life without compromising the environment. This framework is an important tool that decision makers in various countries at various levels can use to optimize policy formulation to have the maximum possible positive impact (Pradhan, Costa, Rybski, Lucht, & Kropp, 2017). Stafford-Smith et al also emphasized the importance of interlinkages to attain the targets under the SDGs ensuring the cohesiveness of policy formulation and implementation. They highlight the importance of involvement of entities in the commercial sector and across countries without which attaining the goals become difficult (Stafford-Smith et al., 2017).

This chapter will focus on key SDGs that the sector can impact with developing sustainability and regular reporting of the steps taken towards developing sustainability. The focus will be on two SDGs – 9 and 12 – based on the targets under those goals that could be achieved by developing sustainability in the auto component manufacturing sector. This chapter will then highlight key issues with developing sustainability initiatives for supply chains. The issues related to regular reporting of sustainability development and reporting in a supply chain will also be examined. The final part of this chapter will develop an understanding of key points to be drawn from the literature review.

There are several SDGs that could fall under the purview of the auto component sector. This study will focus on critical ones that the sector could directly impact in a short period of time independent of government regulations. While many jurisdictions have made requirements for disclosure of non-financial information related to ESG, this is not uniform across political boundaries (D'Aquila, 2018). There will now be a focus on key SDGs that can help directly impact development of positive ESG growth.

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Target 9.3: Understand the level of access that firms could have to financial services to ensure future growth and investment for business growth and sustainability.

Target 9.4: Understand the level of investment made by auto parts manufacturers to develop business growth and sustainability.

SDG 9 directly addresses the primary source of pollution and negative social impact – the industrialized process of developing products for consumption. In this new century, there is an urgency to the realization that production leading to consumption must be addressed to have a real impact. Consumer preferences goes partially to address the rewarding of positive ESG impact behavior by companies, but it can be effective only up to a certain point (Akehurst, Afonso, & Gonçalves, 2012; Hanss, Böhm, Doran, & Homburg, 2016; Lim, 2017). There needs to be an understanding that if companies are financially rewarded for sustainability, they will continue their efforts in this regard. It is also important to not consider fiscal and non-monetary incentives especially with companies that cannot benefit from a pull

strategy. Thus, it is important to look at the portion of earnings that companies can retain for further re-investment.

SDG 12: Ensure sustainable consumption and production patterns

Target 12.6: Understand the level of sustainability and ESG disclosure prevalent among auto parts manufacturing companies

SDG 12 relates to developing consumption and production with minimal negative impact on the environment and society. The key component of developing a cyclical mechanism for sustainability in a company is disclosure of efforts towards sustainability. This study will trace the development of social marketing and the increasing relevance of Corporate Social Responsibility (CSR) in annual reports. The study will look at research that shows that consumers are becoming increasingly skeptical of CSR "activity reports" and prefer sustainability initiatives to CSR (Haller, Staden, & Landis, 2018; Pomering & Johnson, 2009). It is important to measure the overall indexing of reporting of ESG impact and relate that to the expenses incurred by the company in developing additional administrative and operational duties. This will lead to the next section of this chapter focusing on what could be the costs of ensuring positive ESG by monitoring and reporting current business activities.

Pressures resulting from ESG impact awareness

The study of the importance of sustainability in the auto parts sector should be looked at from two perspectives – the internationalization of the auto parts value chain (the importance of understanding the

multiple reporting jurisdictions) and the pressure on the auto manufacturers to develop sustainable forms of vehicles (focusing on the product rather than the process) (Vitale & Schiller, 2017). The international nature of the sector is not a surprise if anyone has followed the trends in globalization since the 1990s. What is surprising is the rapidity with which various sectors have moved a significant portion of their entire production outside North America and Europe to mostly low-cost production centers in the Far East (Aláez-Aller & Longás-García, 2010). While this has been a boon for many companies in terms of their bottom line, it has had interesting implications for scholars and consultants looking to understand the ESG implications of companies operations where there is now plausible deniability of the impact and thus lower risks and liability at least on the surface (Giannakis & Papadopoulos, 2016). While some jurisdictions have issues related to proper reporting of ESG risks, many have decided to be proactive about ESG reporting. China which has the world's largest concentration of manufacturing facilities at various points in the country has actively promoted ESG reporting (O. Weber, 2014). Many other countries have varying requirements for reporting ESG impact. The one common standard, despite all its criticisms, has been the GRI. While some have criticized the selective nature of how companies disclose information, most agree that the GRI as part of integrated reporting is the best currently available (Fernandez-Feijoo, Romero, & Ruiz, 2014b; Hahn & Lülfs, 2014). The literature review will develop an understanding of the pathway to standardized ESG reporting that starts from an understanding of how firms can affect positive change in society to developing a financial reward mechanism for positive behavior.

Another important aspect that needs to be examined is how the pressures has affected auto manufacturing companies and how that pressure is transmitted to the downward value chain partners. The lessons drawn from several other sectors have shown that larger companies tend to put significant cost pressures on their suppliers especially if the supplier is in politically and economically disadvantaged locations (Ehrgott, Reimann, Kaufmann, & Carter, 2011; Girotra, 2014). Several incidents and reports have shown the key methods that suppliers use to get around the pressures for developing positive ESG impact

from their key buyers. One of the most infamous incidents was when many clothing featuring prominent brands were recovered from the wreckage of Rana Plaza in 2013. Many socially responsible buyers claimed “total surprise” when their products were found to have been produced in the ill-fated factory (Licensors et al., 2013; Petah Marian, 2013). Then there are the repeated complaints against massive transnational corporations such as Nestle, Avon and Unilever regarding sourcing of Palm oil from plantations built on deforested land. The issue with sourcing palm oil is twofold – the need for massive amounts of land for the plantation and the resulting pollution from the entire production process from clearing to transportation (Azhar, Saadun, Prideaux, & Lindenmayer, 2017). Both these examples point to critical points to consider. Supply chains are only ESG positive when the respective companies provide a significant margin to their shareholders so they do not have to resort to seizure of low cost factors of production – such as former forest land – or transfer costs pressures to even more desperate suppliers. Some companies claim that sustainability reporting is an unnecessary burden on companies especially in the downward section of a value chain. Some scholars have shown statistically relevant proof that such a claim is valid depending on the sector (Mol, 2015; Okongwu, Morimoto, & Lauras, 2013). They have frequently stated consumer focused sectors can reward suppliers undertaking accurate ESG reporting. The auto manufacturing sector is interesting in that for all the concern about the environmental impact of cars, it is not clear how consumer buying behavior can actually encourage a resilient and positive ESG supply chain (Aláez-Aller & Longás-García, 2010; Oh & Rhee, 2008). There is a huge push towards electric vehicles and hybrids. However, many in industry and research are very concerned about the ultimate impact on the current supply chain and how supply chain players would need to evolve to help auto manufacturers fulfill their ESG goals (Bailey et al., 2010; Hatges & Brown, 2019; Wells, 2013). This study seeks to understand whether these concerns are valid and thus sustainability reporting could produce undue pressure on companies to their financial detriment and declining market share.

Chapter 3 Review of literature

The literature examined focuses on the application of two key theories frequently used to explain the forces that induce companies and other structured entities to develop sustainability. The first theory examined is the stakeholder theory. The review starts with research dealing with the evolution of the field of marketing that was and is often vilified as being a harbinger of the consumption-based culture that has led to devastation across ecosystems. The latter part of the 20th century was remarkable in how ordinary people became more aware of the power of social and political movements. This was the era of large-scale action for various causes such as anti-apartheid campaigns, protecting whales and denuclearization. These movements evolved into pressuring companies into developing socially conscious activities first external to the primary business and then as part of how companies do businesses. This is now reflected in the way businesses communicate with stakeholders including the annual report and the company website. The next stage of the literature review focuses on the second theory underpinning this thesis which is institutional theory. It is important to understand that for profit corporations are going to undertake business strategy and investment decisions that optimizes profit. The evolution of social marketing was leading to the development of consumer movements that focused on reduced consumption and reuse of products. This is anathema to the fundamental target of all companies – business growth. B2B focused companies face a dual issue in this regard – developing positive ESG impact and coping with cost pressures. The literature review looks at what researchers have found could provide a strong indicator of institutional pressures towards developing sustainability or rather lack thereof because of deterioration of financial health.

3.1 Stakeholder theory – overview of the evolution of marketing in developing ESG awareness

3.1.1 Evolution of stakeholder theory to explain ESG related concerns in the modern organization

Ian Mitroff drew on the understanding and awareness of factors external to an organization to develop a new method of decision making. This method would go beyond the profit motive and develop decisions that would make the respective organization a critical part of the socio political context under which it operates (Mitroff, 1983). According to later researchers, Mitroff perhaps underestimated the importance of integrating the business goals of the company and just how many people are involved in the impact of a firm. The simplified mechanism that he developed as an overview of the stakeholder method was expanded on.

In 1984, Freeman developed a broader interpretation of a "stakeholder". This new approach is also very relevant to the understanding of how firms are important to legislation at all levels regarding improving ESG impact – that several stakeholders are every party affected by a firm's decisions with regard to its value chain (Freeman, 1984). This was important because it considered the factors of influence in many forms as well as the political implications of a firm's business decisions in the greater socio-political context.

Donaldson and Preston extend the logic behind developing stakeholder theory to encompass important motivation for normative behavior from not just a purely contractual relationships between components of a value chain, but also the desire for common welfare (Donaldson & Preston, 1995). In summary, stakeholder theory justifies the desire of companies to help develop a feeling of belonging of customers to the company that goes beyond desired features of services and products provided. It justifies the large portion of the budget of companies spent behind marketing, public relations, and corporate social

responsibility initiatives. Marketing has had a critical role to play in developing stakeholder connections whether by direct transactional contract or indirect relationships that encompasses the entire value chain of companies and relevant industrial sectors (Kumar, Rahman, & Kazmi, 2013; Sharma, Iyer, Mehrotra, & Krishnan, 2010). As we shall see later, the marketing encompasses both individual companies in relation to customers and in relation to other companies dependent on them for income and materiel. Two new approaches to marketing that integrates stakeholder awareness is to use the company's website to highlight community involvement and to use the annual report to list initiatives and results (Burritt & Schaltegger, 2010; Busco, Frigo, Quattrone, & Riccaboni, 2013). The relevance and importance of this will be justified in the following sections by analyzing how marketing is used in sustainability from social marketing to corporate sustainability scorecards.

3.1.2 Marketing a sustainable lifestyle – CSR to creating actual impact or "greenwashing"?

The first stage of this transition was the highlighting of Corporate Social Responsibility (CSR) - activities to develop a positive image associated with the company. Pomering and Johnson identifies that there will be a very high level of skepticism to companies promoting corporate social responsibility activities on various promotional materials and voluntary filings related to investors. Based on several previous studies which will be highlighted as follows, they propose to look at coherence of purpose, analysis of impact and statement of long-term commitment as the key aspects of CSR communications that can significantly reduce skepticism (Pomering & Johnson, 2009). In 1993, Grunig developed an overview of how to develop effective public communications. Drawing on research work done on public relations at various levels of an organization, he states that public relations exercises are effective when they draw on what the organization seeks to achieve in terms of strategic goals on a periodic basis instead of plugging the dam

of criticism after a major crisis (Grunig, 1993). This is important because this allows an organization to be proactive and develop a two-way communication process with stakeholders which is more likely to prevent blowback leading to monetary and reputational damage. This is particularly important because many companies have been found engaged in what researchers call “greenwashing”. The research on why companies engage in such is critical because the researchers focus on the dissonance between the professed goals of companies are in terms of sustainability and what they wind up being actually responsible for (Bowen, 2014; Stecker, 2016). The importance of using sustainable value chain management and incentivization will be a key part of how institutional theory is integrated into the research conducted for this thesis. Channel management focusing on partners’ ESG goal achievement and support for their doing so is a key method to resolve the issues of greenwashing.

Brown and Dacin examined what happened when a company with negative associations in terms of the holistic view held about them introduces a new product. If a company with such negative associations introduces a genuinely good product, the product is viewed more favorably than if a product with the exact benefits is introduced by company with a current good impression (T. J. Brown & Dacin, 1997). This is a very important point to take into consideration when companies evaluate the expense and efforts behind attempts at positive corporate image development. Perhaps, they should focus on developing good products than worrying about a filled-out section on the website outlining sustainability initiatives. The effectiveness of developing products and services that have positive ESG impact instead of investing in CSR is a key finding by many researchers. As shall be examined later, this is very important especially for business to business product and service focused companies.

In 1973, Fisk provided an overview of a new method of thinking of the resources that national economies can draw on as technological advances, greater skills of the workforce in various countries and increased productivity. He effectively states that the limit of resources must be estimated to calculate the true price of consumption and of destruction – pollution – thereby ensuring that perhaps societies will value the

environment and each other more (Fisk, 1973). Kilbourne et al provided a very interesting perspective on how to develop sustainability in consumption in 1997 with their focus on macro marketing. This ties in with the progress and failures of social marketing. They argued that since the advent of the promotion of individual products or services in developing a sense of happiness – quality of life – the environment has been adversely affected (Kilbourne, McDonagh, & Prothero, 1997). They have drawn on previous research that shows that changing consumption is difficult because people have specific meanings to products and services consumed. Awareness of adverse ESG impact cannot sway their retraction of utilizing the product. Both papers illustrate the importance of developing an awareness of the effects of consumption. The problem with developing awareness is whether it will induce actual change of behavior.

One major tool used in social marketing and developing campaigns for responsible consumption has been shame or guilt. Burnett and Lunsford looked at how to utilize guilt in developing consumer decision making process not necessarily related to the environment. They found that such tactics work when the consumer is aware of the impact of their consumption habits and thus are willing to take ownership of their behavior (Burnett & Lunsford, 1994). Kilbourne et al in their article stated that if this acceptance of responsibility is part of the socially accepted belief system in a group of consumers, then developing a campaign for socially responsible consumption will be quite effective (Kilbourne et al., 1997). Some campaigns related to the environment seem to engage in various doomsday scenario depictions to jolt their recipients to action. These have been found to have mixed results (Lynes & Wolfe, 2017; Strife, 2010). Researchers have found that such intense negative messaging could accelerate some people's environmentally adverse behavior. Researchers have stressed the importance of developing an alternative vision that groups of consumers can aspire to rather than terrified members of a populace undertaking measures to prevent catastrophe (Block & Keller, 1995; Lynes & Wolfe, 2017).

There are other researchers who have looked more in depth into the messaging related to responsible consumption. The key difference here is that consumption is encouraged not discouraged but in a

direction that is more ESG positive (Lorek & Spangenberg, 2014). The food sector is a critical area where the interplay between messaging, opinions and affordability comes into play when determining the ultimate financial success or failure of sustainability initiatives. This is not looking at the supply chain yet but only at consumer preferences for sustainably produced products. A 2010 study on German consumers of food products found interesting lessons that could be extrapolated to other socio-economically similar markets. Four groups were identified – performers, followers, indecisives and passives (Belz & Schmidt-Riediger, 2010). The implications are that performers will actively seek out positive ESG impact products. The followers will tend to want to identify with the performers and thus copy their consumption behavior. The other two tiers of consumers – indecisives and passives – will either be ambivalent about being positive ESG purchasers or will prioritize economic benefits entirely. This dovetails with previous examinations of social marketing where it was found that campaigns are effective when consumers are able to purchase alternatives and are in a position to influence others to undertake similar "feel-good" behavior (Friedman, 1985, 1999). Companies are particularly aware of such limitations faced by consumers and accordingly set out their business strategy.

In 2011, Bonn and Fisher developed an explanation of the fit of sustainability as part of a company's long-term planning and short-term objectives in an organizational strategy map. They drew on previous work that stated that managers must look beyond sustainability as a way to reduce liability costs and to interweave strategy as part of the modus operandi (Bonn & Fisher, 2011). While this was important as a new way to look at planning, it did not necessarily identify the benefits and tradeoffs. For sustainability to be part of the planning process, many researchers wanted a company to look at what the company was offering and whether sustainability was a concern as a core issue with the company's business – oil companies, coal companies and even car companies (Lacoste, 2016; Morioka, Bolis, Evans, & Carvalho, 2018). This was important because this enabled an understanding of the fundamental shift needed for

many sectors. These researchers argued that sustainability needed to be the core of the business rather than just part of how the company presents itself to consumers and other stakeholders.

3.1.3 Sustainability awareness among stakeholders – differences between business-to-consumer (B2C) and business-to-business (B2B)

There have been significant number of studies that have examined the dynamics of ESG awareness in companies that sell to consumers. Galbreth and Ghosh provided one of the most comprehensive mathematical proofs that customer awareness of the importance of sustainability can contribute to the business performance of the firm (Galbreth & Ghosh, 2013). The key information that needs to be analyzed further is whether the size of the company, the type of product sold and the mode of information delivery regarding the products affects the degree to which companies are rewarded or punished for sustainability. These vary also according to whether the revenue generating client is a consumer or another business.

It is worth discussing a Harvard Business Review web article on how the benefits of becoming sustainable environmentally and socially could be unrewarding for many companies. The primary problem identified is that a significantly high number of sustainability initiatives are not rewarded by consumers. The article published online outlined five routes to develop consumer behavior: using a consumer to consumer network; identify and promote good ESG habits; encourage a sequence of positive ESG behaviors rather than just token measures; develop a balance of rational and emotional appeal for positive ESG habits; and focus on the joyful experience of being a positive ESG consumer (White, Hardisty, & Habib, 2019). This article focuses on a very important point – at the end of the day, being a positive ESG consumer is a choice. A choice that many cannot afford to make. In some cases, even if there is a choice, there is a lack of the

capacity of bridging the gap between intent and action. This is a point that has been well examined by a number of other researchers (Cheng, Woon, & Lynes, 2011). This question of whether sustainability is affordable is particularly relevant when companies that sell to other companies consider whether to develop key investments in their value chain geared towards positive ESG impact.

Mariadoss et al examined 47 firms which were classified as B2B focused businesses to identify what aspects they worked on to develop more sustainable value chains. They found that B2B companies can develop distinctive packaging that are obvious to customers as being environmentally sustainable. They can develop by-products from the regular production process waste to develop both revenue and a reputation for being diligent in reducing waste. They can develop new methods of designing products focused on how to provide positively perceived products to their customers which could help with their customer's need for positive ESG impact (Mariadoss, Tansuhaj, & Mouri, 2011). It was hinted that such steps could reduce the cost structure of doing business for the parties involved in such a commercial relationship. However, it was not clear by how much and which party in the transaction would benefit more.

One sector that has come under considerable criticism regarding considerable negative impact on the environment and society is the fashion industry. The key deficiency in analyzing the issues with a supply chain especially in sectors like fashion and consumer goods is the information regarding the specific processes and people making or harvesting the products (Gualandris & Kalchschmidt, 2016; Mol, 2015). Both Gualandris and Mol want to focus on the process of management. They argue that a hands-off approach by the buying company – i.e. when the purchasing decision is made purely based on economic motivations – means that the supplier will put less emphasis on developing sustainable business practices. The one aspect of the procurement process that can help develop sustainability is information in various forms. Kumar et al attempted to develop an understanding of what key points are used by purchasing corporations to evaluate suppliers. They found that the overt requirements – legal and technical – are

more important than any other “aspirational” aims such as labor conditions, women’s rights, environment etc. While this model was focused on firework industries in South Asia, the fundamental principle holds true that companies buying in bulk – raw materials, components etc. - would look out for their own interests rather than focus on ESG (Thresh Kumar, Palaniappan, Kannan, & Shankar, 2014).

One interesting extension of the importance of information is the issue of trust between the buyer and seller in a B2B relationship. It is important to identify at what point does the desire to win hamper a fruitful relationship. As far back as 2000, when Krause et al examined the importance of working with suppliers, it was found that both the buyer and the seller in such sourcing transactions prospered significantly when supplier development was undertake constructively rather than coercively (Krause, Scannell, & Calantone, 2000). To understand the conflicting internal forces in organization that dictate whether B2B entities cooperate or compete, we need to examine the importance and application of institutional theory.

3.2 Institutional theory explaining adaptation of sustainability initiatives as well as the role of standardized reporting

3.2.1 Institutional theory in understanding the development of sustainability

Early proponents of the institutional theory focused on the ability of such an entity to bring together resources towards accomplishing set goals whether related to public good or personal profit with a set expectation of behavior and values. Later, researchers found that the perception of such entities as a monolith encompassing prescribed behavior and understanding of roles was a fallacy due to accepted norms between people in an organization (Meyer & Rowan, 1977; M. Weber et al., 1968). Meyer and

Rowan stated that the old institutional theory does not consider the evolution of organizations to meet unique challenges.

Peters provided an outline of the evolution of institutional theory within the context of political science. This is worth examining to understand the evolution of decision making because of the power imbued in various roles in an organization. He states that the old institutional theory had helped make sense of specific decision points in context of the degree of power inherent to the role or position when organizations faced very static socio-economic contexts. However, as democracies evolved, and more people were active in taking political power in their own hands, the decision making became the result of a number of factors that come into play where the motivations may not be clear (Peters, 2012). This points to a developing phenomenon that organizational decisions are increasingly made in compromise to varying, sometimes opposing, motivations external to the organization.

Powell and DiMaggio's book provides further insight when analyzing the "new" institutional theory as they look at the impact of opening up of various economies around the world and of the international nature of many organizations as they seek opportunities in every corner of the globe. They also state that the primary motivation of analysis of key decisions are increasingly external to the organization and usually isn't the same in every case (W. W. Powell & DiMaggio, 1991). Taken together, both books point to a new theoretical framework where competition and the concerns of entities other than shareholders and customers affect a company's decision making.

Other research undertaken seeks to develop this new form of institutional theory can help understand how to develop guidelines for sustainability. Campbell provided an outline to understanding CSR activities. He stated that corporations will engage in CSR activities because of economic benefits rather than true altruistic intentions. He developed an outline of the key forces that could push a corporation to become more socially responsible – financial rewards, strong regulations and effective monitoring – than trying to

convince using abstract ideas of morality and good corporate citizenship (Campbell, 2007). While the arguments made by Campbell is valid in many cases, other researchers have pointed to more than these economic and legislative forces to explain why sustainability is integrated into organizations.

In 2013, Gauthier examined whether it was purely market-based factors that motivated companies to adopt sustainability. He undertook an analysis of 391 companies to identify what type of forces – determinant (prices for goods, market share of competition etc.) or interactive (firm size etc.) – determine whether a company will develop sustainability measures in its core business model. Gauthier drew on previous work done by Oliver to identify that organizations are not passive. The key finding from Oliver's work was that organizations, especially because they face limited resources to draw from, do not necessarily conform to established norms and practices within their industry (Oliver, 2018). This explained Gauthier's findings that the industry did not determine what a company would do and thus a company may or may not develop sustainability even if competition does. He instead found that internal forces within an organization could determine the level of commitment to sustainability (Gauthier, 2013). This is a very important finding that organizations may not follow the most rational course of action to respond to external forces affecting whether they would initiate and follow through on organizational sustainability initiatives.

3.2.2 Institutional theory explaining intra-organizational pressures to adopt sustainability

The stakeholder theory is a key part of explaining much of the pressures to adapt sustainability initiatives in companies. However, it is also critical to look at how institutional theory enhances the explanation of how sustainability is adopted and at what levels. This can then lead to understanding how sustainability can put untenable pressures on value chain partners, especially on sourcing. This latter is important

because there is a distinct difference in the payoff for a company directly interfacing with customers versus a company whose primary source of income is other businesses (Hollos, Blome, & Foerstl, 2012; Meinlschmidt, Schleper, & Foerstl, 2018; Wilson, 2015).

In 2014, Humphreys wrote an article describing the shift in how CSR activities became the norm as opposed to something done to appease a select group of stakeholders usually not customers or suppliers. The transition to formal sustainable business practices in various stages was stated to come about because of structuration of the process - awareness of an environmental issue and then development of an organizational function or process to deal with the issue (Humphreys, 2014). This is an important contribution to understanding how companies can become environmentally and socially viable – a workforce that understands, sympathizes and is willing to undertake modifications at cost to deal with issues combined within an organizational flexibility that allows for such initiatives (Humphreys, 2014).

An overview of articles by Rodrigo Lozano can identify another process of evolution of the need for corporations to undertake sustainability. In 2008, Lozano developed a critique of how sustainability was depicted. He stated that sustainability cannot be defined as a set emphasis placed on the economy, society, and economy. He stated that each change in one of the three will have an interrelated impact on the other two. He underscored the need for defining sustainability into two interconnected frameworks – the two tiered sustainability equilibria (the TTSE) – where the state of each aspect of sustainability is combined with the temporal consequences of progress and regression in each case (Lozano, 2008). This framework, while somewhat unnecessarily complicated for immediate decision making for a company, can help an organization define its scope of influence on sustainability over a longer period. This could be a key framework with which to develop outline of actions like 5-year plans developed in government planning processes.

In 2012, Lozano developed another critical analysis of corporate sustainability related plan. He drew on a listing of common sustainability initiatives and extrapolated the usefulness not just to ESG and time aspects of sustainability but also how they related to the company's critical processes. He was able to identify that a key issue with any sustainability initiative is that each has a combination of effects that is uneven on ESG considerations for the company. They also draw on resources available to a company which are limited. He proposed another framework – CIVIS – to help corporate decision makers to understand which specific initiative would provide the most pay off in terms of ESG impact over time while providing the company with significant commercial benefits (Lozano, 2012). This framework needs to identify the alternative choices to develop ESG impact using the set of resources allocated. Then the management choses the one method that shows the most impact in the three dimensions – ESG – over time. This proposed framework is an interesting method to develop a better decision-making process for senior management. However, there is the question of uncertainty in outcomes over time. Lozano's CIVIS framework will be a key tool used in the qualitative analysis of the study.

In 2016, Lozano published research completed on sustainability reporting. This is a key document for many management consultants interested in monitoring of both impact and the resource cost of sustainability initiatives. He found that sustainability reporting has a reciprocal relationship with organizational change. While corporate sustainability has to be always balanced with financial performance, the availability of sustainability reporting allows investors and other external stakeholders to have a summary to reassure or perhaps even get excited about future initiatives (Lozano, Nummert, & Ceulemans, 2016). It is worth examining the importance of sustainability reporting in further detail not only within the context of institutions but also in terms of the potential to induce change to a more sustainable value chain.

3.2.3 Integration of ESG impact as a regular periodic information output

The concept of the triple bottom line was proposed by John Elkington when he proposed a more expansive approach to reporting business performance of businesses (Elkington, 1999). In his 2008 review of the concept published in the Harvard Business Review online journal, he revised the concept in a key aspect calling for a massive system change rather than individual companies trying to do good in a sea of for profit driven management philosophy (Elkington, 2018). This transformation is reflected in research done on his concept whether identified as “triple bottom line” or in other forms such as positive ESG impact business operations etc. In most cases, the key question asked is: can the benefits of sustainability be quantified in the age of the quarterly financial report as “sustainability accounting”?

One article cited very frequently by researchers on sustainability accounting is one by Gray published in 1992. This is one of the most important critiques of the standard accounting method of valuing a company’s revenue and balance sheet without taking into consideration the hidden costs to society who will have to clean up afterwards (Gray, 1992). One very important point raised in this article is the issue of valuing the fact that once certain mineral resources and other one-time assets are used, they cannot be replenished. This is not even taking into consideration the cost of “reclaiming” the land after such extractive industries have depleted the area. While he did identify the critical issues related to valuation of such remedial work, his article did not provide specific new ways to integrate this cost into a standard accounting statement.

In 1997, Schaltegger and Muller looked at how to develop an actual quantitative analysis of the benefits of proactively dealing with pollution (Stefan Schaltegger & Muller, 1997). This was among the first articles which advocated the measurement of future benefits rather than measuring only past accounting events. Another important work by Schaltegger was his book published in 2000 about environmental accounting.

One key information provided was that environmental investments were defined by the Canadian Institute of chartered accountants as investments to prevent and clean up environmental damage. This is relevant because of the heavy dependence of portions of Canada's economy on oil extracted from tar sands which in turn affects key biosphere factors such as water and arable land (S Schaltegger & Burritt, 2000). This article was important in understanding the development of the valuation of pollution accepting such a concept as part of the expenses section of the income statement.

In 2006, Schaltegger et al published a chapter on sustainability reporting which drew on some key issues identified previously and developed some additional ideas about how to proceed towards a uniform mechanism. The first premise developed was that there was a strong need for a uniform mechanism of reporting progress both towards and away from sustainability in organizations. They also highlight the very important point of the direction of flow of information. Their chapter makes it clear that sustainability reporting, like accounting reporting, must draw from verifiable information that allows external stakeholders to understand the current state of sustainability in the organization (Stefan Schaltegger, Bennett, & Burritt, 2006). While this chapter and other research done by Schaltegger is very illuminating in highlighting how companies can uniformly report sustainability, further review is needed to identify the most effective mechanism to identify and measure the metrics that could lead to definitive conclusions about the state of sustainability in the organization.

In 2010, they published another article reviewing considerable literature published till then about sustainability reporting. Here they state that sustainability accounting cannot be left to a purely quantitative approach where sustainability goals set were monitored for how much they were achieved or not. They projected that soon companies would integrate the forward looking information that is necessary to develop a comprehensive overview of how sustainable a company is across its social and political (Burritt & Schaltegger, 2010). This was interesting because basically this is a preliminary outline of the justification of a cross disciplinary framework. As we shall see, in 2015 such a cross disciplinary

framework was developed to become the world Sustainable Development Goals which has its own issues related to reporting.

The Global Reporting Initiative (GRI) existed before the SDG framework since 1999. The GRI standards were among the first attempts to develop a uniform representation of the level of ESG compliance and impact. Researchers have developed a more comprehensive understanding of the issues with adapting GRI as part of the consistent periodic reporting by commercial organizations. Brown et al developed a study which showed that GRI adaptation is made easier with the involvement of multi stakeholders in an organization. It was also found that just GRI adaptation didn't lead to a real change in how companies do business (H. S. Brown, de Jong, & Levy, 2009). While this conclusion was useful, it is important to identify the specific factors that could detract from developing initiatives because of GRI reporting. It is also important to identify whether GRI reporting provided a comparable scorecard to compare ESG impact across various industries.

Alazzani et al looked at the oil and gas sectors adaptation of GRI in their reporting mechanisms which can help us understand some key issues with the actual disclosure. According to the researchers, the oil and gas companies made a very reasonable attempt to disclose their impact on the environment and how they planned to deal with the issues raised. However, when the list is examined, there is a fundamental problem: the reporting does not seem to deal with the long term effects of using their core product – fossil fuels (Alazzani & Wan-Hussin, 2013). This issue with selective disclosure on ESG was also reflected in another research done by Clarkson et al. They found that it is important to distinguish between environmental performance and disclosure. This is made particularly important as it has been found that companies do not release all the information related to the core business they do (Clarkson, Li, Richardson, & Vasvari, 2008). Both these papers highlight the importance of disclosure of information but do not provide insights on why companies would not disclose the full impact of their business. In the case of oil and gas companies, it is obvious and some companies are clearly attempting to "greenwash" their

corporate reputation (Hahn & Lülfs, 2014). We need to analyze what could motivate companies to develop a consistent and effective sustainability reporting mechanism.

Fernando-Feijoo undertook a critical analysis of how corporate behavior is affected by the impact of CSR reporting. This is important both for the fundamentals of this thesis and for analyzing the extent of adaptation and effectiveness of GRI when adapted by commercial organizations. They found that large firms listed on the stock exchange undertakes disclosure of considerable CSR information. However, unlike smaller firms, the reliability of the truthfulness of their information is a very important concern (Fernandez-Feijoo et al., 2014b). This means that while many large auto companies have strong ESG disclosure mechanisms, they could be selective in the information they ultimately present and highlight in their websites and sustainability reports. Since voluntary disclosure seems to be a key part of developing perceptions about ESG performance, it is worth understanding why and which aspects companies tend to focus on.

Some answers can be found in the research done by Brown et al and by Lee and Maxfield. In both papers, they highlight the importance of who is going to be the recipient of the information released through the GRI. Brown et al discusses the importance of the resulting discussions among all stakeholders which affect the adaptation to become better. Lee and Maxfield talk about the importance of developing sustainability reports geared towards shareholders which rewards the management by higher valuations in the financial markets (H. S. Brown et al., 2009; Lee & Maxfield, 2015). While these two papers allow a study of some key points to consider when analyzing the forces that enable accuracy in GRI reporting, it still doesn't explain the deviations used by companies when intending to hide key information about their business processes.

GRI and the Accounting for Sustainability Project joined forces to develop the International Integrated Reporting Council (IIRC) to develop a single comprehensive standard to merge the correct form of

sustainability reporting with financial reporting to make it easier for investors and market players to promote sustainability through guided investments rewarding the most effective companies (Adams, 2015). The evaluation of the effectiveness of this organization is very interesting in that it highlights the fallacies of the most noble of intentions if implemented wrongly as researched by Flower (Flower, 2015). Flower states some key weaknesses that is reflected in many sustainability reports undertaken using GRI guiding principles. The structured report on sustainability as specified by the IIRC is sometimes held as an addendum and of lesser importance to the financial report. He stated that it is important to define the goals of sustainability initiatives undertaken and for the goals to be part of the organizational performance monitoring structure and given the same importance as to the financial data. In many cases, he finds that it is not.

In essence, the issues with the development of GRI, or similar standards, based sustainability reporting points to some key issues: any standardized sustainability reporting is not given the same priority as financial reporting; the reporting process is in many cases is not of consequence when it comes to rewarding or punishing management; and there is significant deviations between information actually disclosed and what needs to be disclosed. Further complications related to sustainability reporting comes about because of the transnational nature of commercial organizations. Many companies have operations in various countries which makes the actual legal compliance reporting very complicated (Lozano, 2012; Meinlschmidt et al., 2018; Tate, Ellram, & Dooley, 2012). This overview of sustainability analysis and reporting must look at research related to sustainable value chain partners. In the auto sector, this is particularly important because there has been massive consolidation leading to considerably fewer choices in terms of potential suppliers across the world.

3.2.4 Institutional Theory perspective on developing a sustainable value chain

Bob Willard published his thoughts in 2002 about developing sustainable value chains. In 2012 he provided significant additions and supporting information. One major change in the 2012 edition that is very useful for this thesis is the way the benefits are calculated differently based on the size of the firm (Willard, 2012). The primary benefits of sustainability were not highlighted in an abstract context. Willard looked at the specific areas where a company can develop new opportunities for revenue, reduction of costs and increase in employee productivity. These are actual monetary benefits that will satisfy the shareholder and the stock market. Willard along with others developed the Framework for Strategic Sustainable Development (FSSD) to integrate the business benefits of being sustainable so that corporate leaders could identify strategic paths to be taken (Kurucz, Colbert, Lüdeke-Freund, Upward, & Willard, 2017).

One research work cited frequently to analyze why companies try to be sustainable is by Gimenez et al which looks at the benefits of implementing sustainability in the production of goods and services. This article was particularly illuminating in providing some key conclusions – sustainability initiatives focused towards production provided social and environmental benefits for a company but didn't really have a positive impact on financial performance (Gimenez et al., 2012). They also looked at external collaboration with supply chain partners to identify whether the company should invest further in this area. They concluded that supply chain related sustainability initiatives did not yield the positive ESG impact desired. This study has been a strong inspiration for this thesis. There are some important critiques of this research to consider. The investment required to develop sustainability cannot be expected to yield immediate financial benefits for some firms. Another key concept that comes into play is economies of scale when

cost is distributed among output. The finding that investing in developing sustainability in the supply chain is not fruitful is contradicted in other key studies.

One such study was done by Hollos et al in a study of Western European firms regarding how to integrate sustainability in their supply chain. They do state that sustainable suppliers are scarce in any value chain because many suppliers are not interested in sustainability without being rewarded adequately for the sustainability initiatives. This is something to consider when developing the supply chain partner related policies and the pricing strategy (Hollos et al., 2012). Their research focused on the purchasing firm and how they can benefit the development of a sustainable value chain. They identified that the perspective of the supplier firms could be wholly different in terms of the desired support and initiatives to help develop sustainability. There could also be the context of organizational culture and whether the buying firm is geared towards rewarding sustainability at the cost of their own economic benefit (Goebel, Reuter, Pibernik, & Sichtmann, 2012). Goebel et al found that the supplier selection and reward policies were heavily determined by whether the primary decision makers in the buying organization were inclined to conduct themselves ethically. This research finding is very useful in determining whether the auto sector supply chain can develop sustainability or whether lowering margins will weed out suppliers investing in themselves to develop sustainability.

In 2003, Sahay developed an outline of the importance and process of developing trust among supply chain partners. The first step was to explore key areas of concern for both parties. Second, he recommended that an effective way to build trust is to forego some advantage that is obvious and allows the weaker party to feel a sense of confidence. Third, the benefits of cooperation must be apparent to both parties and always part of the agreement (Sahay, 2003). While other researchers quote this paper as a good outline of ways to build trust, they also state that the power differential cannot be overlooked. The power differential is particularly stark in international supply arrangements. This is something that

cannot easily be measured other than specific financial measures that can provide an indication of the likely strategic decisions that companies need to take because of quarterly financial performance.

3.3 Convergence of stakeholder and institutional theory – yearly reports and websites

3.3.1 Importance of websites and the annual report for sustainable initiatives monitoring

Bob Willard in his 2005 book argued against key objections that many investors and business owners could have against developing sustainability in business. One key point that he highlighted is the issue of time in determining the contribution to a company. Most sustainability initiatives are geared towards long term impact, yet companies are evaluated quarterly and annually. His argument against this was two-fold. First, without long term planning a company is not expected to succeed. Second, every well-chosen sustainability initiatives reduces the yearly cost of various incidental costs afterwards (Willard, 2020). Whether to increase the positive perception of a company or for developing better communications with shareholders, many companies have combined their sustainability report with the compulsory financial filings to develop integrated reporting documents.

The advent of information technology has led to very interesting dynamics regarding integrated reporting. Isenmann et al provides a valuable overview of how reporting online has overcome many non-technical issues with integrating sustainability reporting in the annual report. These primarily result from jurisdictional filing requirements. An online system can help develop legal compliance and yet a comprehensive approach to reporting the cost and benefits of sustainability initiatives in the annual report and other formal stakeholder related documents (Isenmann, Bey, & Welter, 2007). Thus, the

website of a company has become extremely important in developing promotional information sources for external stakeholders related to sustainability.

Other researchers have focused on the effectiveness and usefulness of sustainability reporting in the investor related documents. In 2016, Haller et al provided an interesting perspective on how sustainability initiative related disclosures may not reflect the actual fairness of the impact of sustainability initiatives. They state that while many companies can claim a lot on their reports, a closer examination of many descriptions highlight initiatives that benefit the company reporting more than on the respective players in the supply chain and other affected parties (Haller et al., 2018). Thus, it is important to understand the goals of every integrated report provided by companies that outlines financial performance with stated social and environmental impact.

Fasan et al in their published chapter in a 2016 book on integrated reporting provided some very critical insights related to sustainability reporting through the annual report. They propose that companies based in countries with strong codified consequences to irresponsible behavior are more likely to disclose initiatives taken. They identify that companies that are larger have a greater number of stakeholders who can affect their financial performance and market value (Fasan, Marcon, & Mio, 2016). In the auto parts sector, the significant number of players are now large companies wherever they are based because of the massive market consolidation of the last decade. Some companies are privately held which means they do not disclose information related to financial performance let along sustainability initiatives. At the end of the day, it is better to focus on companies that are publicly listed. This allows a direct comparison based on the verified financial information and the stated disclosures of risks.

3.3.2 Key metrics to analyze from annual reports related to sustainability and proposed timeline of data

Researchers have various opinions on which metrics from various standardized annual reports can help investors and other external stakeholders glean the level of commitment of sustainability of a firm. Gamerschlag et al in a 2011 examination of German firms found that a firm with a greater number of shareholders has better disclosure practices – indicating that listed firms will have better sustainability practices. Higher profitability allows companies to invest in and develop better sustainability practices, thus profit margin can be a key metric to develop and understanding of levels of sustainability (Aguilar-Fernández & Otegi-Olaso, 2018; Gamerschlag, Moller, & Verbeeten, 2011). This study looked at companies with voluntary disclosure of ESG related issues. While this research was very useful, it is important to identify other metrics that can indicate level of sustainability irrespective of voluntary disclosure.

Oshika and Saka provided a key context that sustainable firms will have consistent profit margins with a level commensurate with the level of sustainability. While this may not always hold true with many companies struggling to survive, it holds when a company has shown consistent profits over a long period of time. This is true the auto parts company since 2012 after the economic recovery post 2008 financial crisis (Oshika & Saka, 2017; Pavlínek, 2015). This indicates that it is worth looking at profitability over a multi-year period in absence of a critical crisis. Gimpel and Graf-drasch developed a game theory-based model to explain the optimum points where companies can invest in sustainability initiatives. One critical part of this model was looking at how companies could overcome conditions of information asymmetry to decide on whether to develop sustainability. They proposed that investing in sustainability did not yield

much additional revenue. They theorized that, big or small, firms that invested in sustainability earlier would gain the most return (Gimpel, Graf-Drasch, Kammerer, Keller, & Zheng, 2019).

Bailey et al projected in 2010 that the auto sector would recover and develop new technologies to meet competitive and environmental challenges. Their proposed timeline started from 2012 (Bailey et al., 2010). This timeline was confirmed by Platt and Platt in their 2013 overview of a key risk to auto manufacturers – the failures of parts suppliers in the Americas and East Asia. They state definitively that by 2012, the large car manufacturers had reinvented themselves and were doing financially much better than at the worst point during the crisis (Platt & Platt, 2013). Their paper laid out that after 2012, the auto companies had started to put significant pressure on the components companies to develop a very dynamic model responding to their needs but at higher risk for the component manufacturers. The American component companies faced significant debt repayment risk whereas the East Asian companies had issues with attaining a desired level of sales.

Schoenmaker highlighted the need for developing long-term investment in developing sustainability in the value chain. He proposed that to become sustainable, companies must evaluate and commit to changes in the businesses processes. This requires long-term investment (Schoenmaker & Schramade, 2019). While the primary focus of their published paper was focused on allocation of capital by investors to encourage sustainability, the same logic can be extended to individual firms looking to make long term strategic plans. This means that one key metric to look for is the investment that the company makes in property plant and equipment as well as the net cashflow related to investing activities every year.

Some researchers highlight the key finding that companies that are sustainable can keep significantly lower resources on hand to make up for any potential shortfall in acquiring inputs for the production process. This means that fewer amounts of pre-production items and raw materials could be needed at the beginning of every year (De Oliveira Neto, Vendrametto, Naas, Palmeri, & Lucato, 2016; Figge & Hahn,

2012). This allows us to infer that decreasing inventory, supplies and cash on hand could be a sign that the company has attained significant efficiencies in material use and a better handling of liquid financial resources.

In summary, the literature review identifies the need to analyze the reporting of sustainability as a key component of measuring company commitment. This aspect would be easier to do if the sector were focused towards consumers such as the fashion industry or large fast-moving consumer goods conglomerates (FMCG). There are large number of advocacy organizations that work with firms directly and others who act as sentinels against exploitative practices. In the case of auto parts supply chain, a significant portion of the disclosure is voluntary and judged by adherence to established standards such as GRI. This means that the actual impact is difficult to analyze without in-depth understanding of the financial and social context of the companies which has been shown to be effective in analysis of sustainability in various other sectors (Epstein, Vogt, Cox, & Shimek, 2014; Rebai, Azaiez, & Saidane, 2016).

This study seeks to narrow down a few potential warning signs that a company is either not providing the full context of sustainability initiatives or could be in financial trouble in the long run. The methodology that follows will define the various outcomes of the study and the potential learning outcomes leading to a comprehensive understanding of a selected sample of key players in the selected sector. Based on the current situation of data availability from this sector, a significant goal of the resulting analysis will be to draw out inferred conclusions.

3.4 Research objectives and contributions

The key objectives of the study are to identify the current level of sustainability disclosure and to identify what could detract from a higher level of disclosure. Some companies are using the GRI standards and even then, in an irregular manner as will be outlined in the study. The study will look at companies derived from two sources – Automotive News listing of top 2018 OEM parts suppliers and a WardsAuto.com suppliers list provided on request. The automotive news listing is important to provide a general overview of this specific section of the auto manufacturing value chain. This provides an overview of the level of fragmentation and the potential power of each player within the context of the suppliers. A significant number of the firms listed are private and thus the information available on the financial health of these companies are very limited. This study will focus on publicly listed firms across various stock listings. Previous studies have found that a lot of firms across various sectors have undertaken integrated reporting but very few have been able to develop a comprehensive picture of actual sustainable business initiatives in their regular investor related reporting (Dumay, Guthrie, & Farneti, 2010; Fasan et al., 2016; Gamerschlag et al., 2011).

3.4.1 Problem statement

This study seeks to develop an understanding of the financial health and the concurrent sustainability disclosure of supply chain auto parts manufacturers who sell to the large auto manufacturing companies. This study will seek to develop an understanding of the level of fragmentation globally as most analysts agree that intra country consolidation has left few key players in every country (Holmes et al., 2017; Vitale

& Schiller, 2017). In Canada, the OEM car components market is dominated by a few key players with a lot of subcontracting work undertaken by large number of smaller businesses close to the key manufacturing facilities of the Canadian firms (Holmes et al., 2017; Sweeney & Mordue, 2017). It is vitally important to identify the future financial trends to understand the pressures that developing sustainability could entail. This will provide an indication as to whether the companies are genuinely developing and changing or whether they are very likely to pass on the costs and liabilities to nimbler firms thereby propagating an economically profitable but environmentally and socially fragile supply chain.

3.4.2 Research Question(s)

The key research question is:

Have OEM auto parts companies who report sustainability initiatives been sincere in their efforts towards sustainability and have they been financially rewarded or penalized for undertaking such? How broad is the level of sustainability disclosure by key Canadian auto component manufacturing companies?

The study will focus on financial data from the last five years to develop an understanding of the various trends in selected financial data. This draws on considerable literature that support the underlying assumption that corporate push towards sustainability (at least in awareness and reporting) has accelerated considerably since 2010 among businesses in all sectors and of all sizes (Cantele & Zardini, 2018; Hörisch, Ortas, Schaltegger, & Álvarez, 2015). The specific financial measures that will be looked at include net income, operating expenses, inventory, and net investment. These indicators can provide a general idea of the “substance” of the claims made in verified annual reports and other materials

sanctioned by the company and posted on the website or provided as part of the general information provided to buyers and other stakeholders. Another critical aspect that will be looked at is whether country of jurisdiction affects the financial health of the companies. This is important to identify whether Canadian federal and provincial policies need to be examined to develop a better support system to develop ESG positive impact and yet remain financially healthy.

Chapter 4 Methodology

The primary purpose of this section is to first outline the key points of the current paradigm that underpins the theoretical framework of this study and then show what method would be optimal to determine how to develop sustainability reporting within the auto component manufacturing sector in the world and then Canada. The auto component manufacturing sector, a three trillion USD sector according to IBISWorld, has differing forces that come into play when contrasting with the car manufacturers who are their primary customers (IBISWorld, 2020; Platt & Platt, 2013; Standard & Poors, 2018). To investigate this, four key questions were taken into consideration in the collection of data for this research:

i. What is the level of sustainability disclosure undertaken by companies in the auto parts manufacturing sector? The level is defined by the number of times the company undertakes reporting on sustainability, the type of initiatives disclosed and whether the company follows GRI standards.
ii. What are the components – community initiatives, GRI reporting, ESG risks – that are highlighted in the information related to sustainability?
iii. What is the correlation of dimensional (country and size) and financial factors with the level of sustainability disclosure?
iv. Can an actual analysis of ESG impact be discerned from disclosures of a subsidiary sample of key Canadian auto component manufacturers?

Since the study encompasses an examination of quantitative and qualitative data, the worldview governing the research design is a pragmatic research paradigm (Creswell & Creswell, 2018).

A summary of the key steps and outlines of the study is provided below that highlights the connection to the methodology.

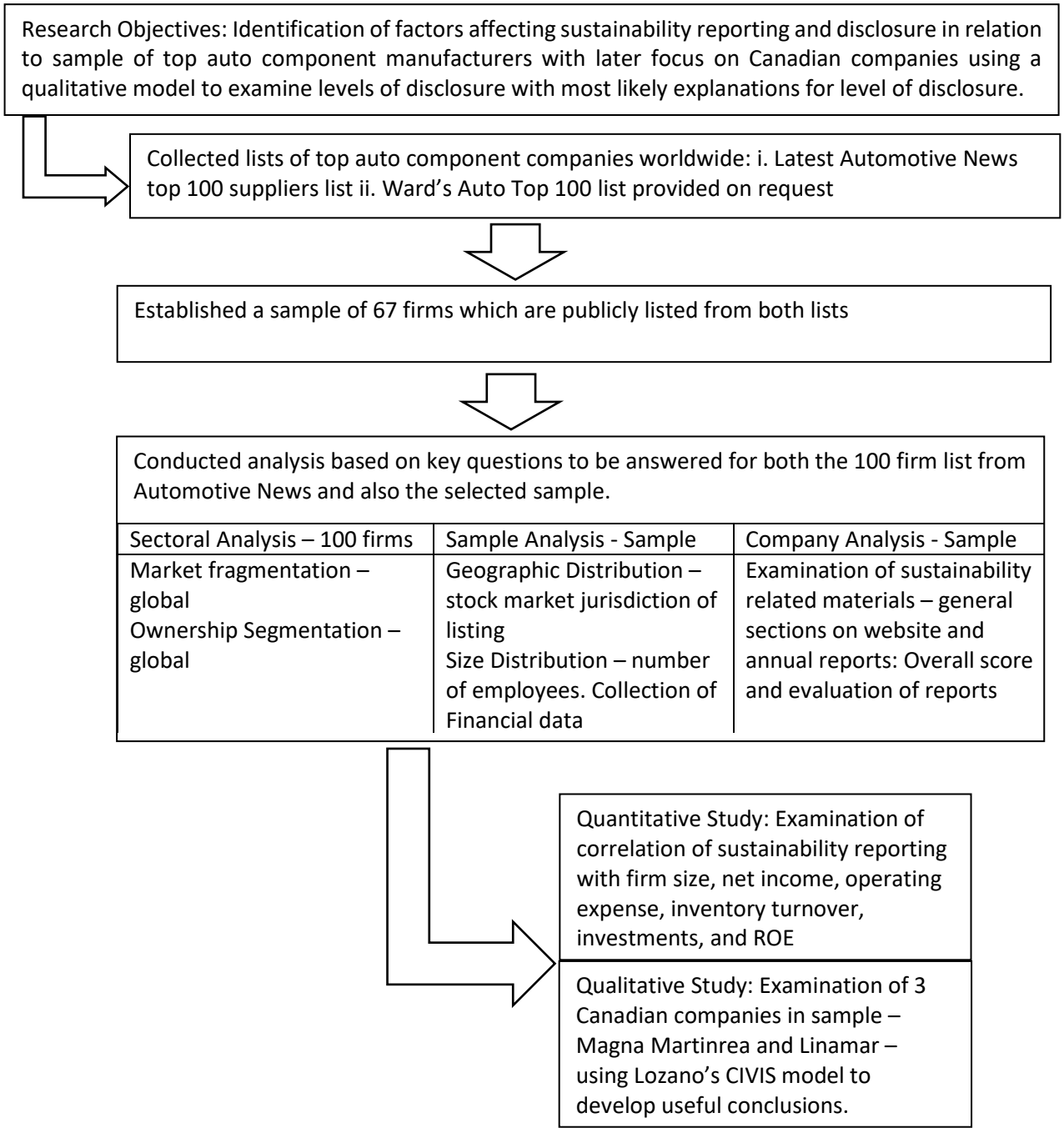

Figure 4-1 Outline of flow of study data and information

4.1 Key points from literature supporting the methodology

Based on literature related to stakeholder awareness in B2B supply chains, it is important for a company to communicate its sustainability initiatives to all stakeholders (H. S. Brown et al., 2009; Eccles & Serafeim, 2013). Companies which are the suppliers downwards in the auto component value chain cannot be expected to be rewarded for sustainability initiatives based on auto customer preferences because this push force for sustainability applies to the actual auto manufacturers (Krause et al., 2000). For most sectors that focus on supplying the components for another consumer focused industry, communication of sustainability is important usually to the point where customers (usually large international conglomerates) and investors are assured of legal compliance and efficiency of business (Gimenez et al., 2012; Gimpel et al., 2019). While GRI is accepted as the standard, it is not universally adopted and nor is a system of integrated reporting (Flower, 2015). The adaptation of sustainability reporting – GRI and other mechanisms – is considered by many as part of "pull" strategy – ensuring demand from loyal consumers passionate about doing good while partaking in a consumerist culture – that is usually successful in consumer-focused industries like fast fashion and coffee (Kolk, 2012; Tapp & Spotswood, 2013). Researchers contend that the same strategy cannot be expected to be effective here in the B2B auto component sector (Hollos et al., 2012). For B2B companies in the auto component sectors, the amount of money they earn in terms of gross profit is an important determinant of how much they could be willing to spend on sustainability initiatives (Oshika & Saka, 2017; Pavlínek, 2015). By 2012, the auto sector had largely recovered with close to full production prior to the 2008 financial crisis levels but had undergone significant restructuring which in turn affected the auto components sector. This included consolidation of companies, shift in production away from North America and increased demand for electric cars (Bailey et al., 2010). The auto components sector, just like many other sectors trying to improve their

sustainability practices, needs to focus benefits such as control of materials and operational expenses which will enable them to develop a direct positive impact of sustainability (Goebel et al., 2012).

4.2 Outline of data sources, timelines, and respective hypotheses

4.2.1 Source of data

After exploring various options, the following sources of data has been identified for gathering data for this research. Each source relates to specific insights that answers key questions as outlined above.

i. A listing of the top 100 auto parts suppliers of the world from Automotive news annual supplement and further companies added as per a top 100 North American supplier list provided on request from WardsAuto.com. Both lists were compiled by sales. The Automotive news annual supplement includes latest sales data for both public and privately held companies. This allows the formation of an analysis of the level of fragmentation and a general overview of the sector worldwide. The WardsAuto.com list adds companies to develop a sample of publicly listed companies. From both lists, firms were selected that were publicly listed and had information from 2012. The reasoning behind the selection of the time horizon from 2012 is given in 4.3.2. A final list of 67 firms that fulfilled the criteria was found and analyzed for the in-depth examination using statistical tools.

ii. Yahoo finance for the financial results of publicly listed companies available. Yahoo Finance was selected because the website provides downloadable financials in .csv format for companies across multiple stock markets around the world.

iii. The respective company website for level of sustainability reporting. Each company website is examined for specific criteria about their sustainability and community development initiatives.

iv. The GRI sustainability disclosure database to verify adherence to GRI standards for the companies who have undertaken this measure. The GRI database allows us to identify the level and consistency of adherence to GRI standards.

4.2.2 Sample size and data sourcing timeline

Each set of financial data consists of the income statement, balance sheet and cash flow statement. The time horizon for data starts from 2012 when the number of vehicles ordered had returned to levels comparable to pre 2008 financial crisis (Bailey et al., 2010; Hatges & Brown, 2019; Platt & Platt, 2013). The financial analysis was done with financial data from 2015 to 2019 except the Return on Equity Analysis which has looked at net income and equity from 2012. The years 2015 - 2019 were very stable for the sector and the general economy of the respective countries. This is also the time when more companies included sustainability into their annual reporting developing more frequent integrated reports (Fasan et al., 2016; Maniora, 2017; Rebai et al., 2016). The ROE was done with financial data from 2012 to ensure a better comparison with the S&P 10-year index. Many companies have only recently started emphasizing ESG impact. This reduced timeline (2015 – 2019) allows for a more accurate comparison instead of making allowances for varying adaptation timelines. Previous studies have found that significant number of companies have adopted GRI guidelines in their reporting of sustainability from the creation of the Global Sustainability Standards board in 2014 and especially after the setting of SDGs in 2015 (Hörisch et al., 2015; Maniora, 2017). The years 2018 and 2019 are important because of the development and

adaptation of comprehensive GRI guidelines for integrated reporting. This is key because the new comprehensive GRI standards were set in 2018 that allowed for more standardized in-depth integration of sustainability related disclosures in the annual report (García-Sánchez, Gómez-Miranda, David, & Rodríguez-Ariza, 2019).

4.2.3 Critical issues to consider regarding data

- The data related to disclosure of ESG issues is subjective and based on looking at the annual reports and the website. Thus, a score card was developed to look at specific criteria for classification. The scorecard is outlined below in section 4.3.4.
- 34 companies in the selected sample do not adhere to GRI – Global Reporting Initiative – and 33 have some form of GRI reporting. Thus, the sample from which to draw conclusions about GRI is very small. Nonetheless this is enlightening in further developing hypothesis about why the sector might not adhere to GRI but instead use the website as their primary medium to develop a positive image about ESG impact.
- One issue with the downloaded financial data collected is the fact that varying financial statements are in currencies such as Euro, Japanese Yen and in Hong Kong Dollar in addition to the US dollar. This is a key problem in developing a comprehensive analysis of the companies in the sector due to the vast international reach. To this end, the following process is outlined to compensate for this:

i. Net income and operating expenses were assigned as percentage of total revenue – net profit ratio for example.

ii. Investments in business expansion and equipment will be considered in terms of the change from one year to the next within the selected timeline.

iii. Inventory turnover ratio will be considered. This draws on researcher work that state that when companies attain significant material efficiency, they plan for carrying less inventory (raw materials and finished products) and hold more cash equivalent and liquid investments (Chang, C. H., Dandapani, K., & Prakash, 2013; Wang, Ji, Chen, & Song, 2014).

4.2.4 Coding of levels of sustainability disclosure (including ESG risks) and marketing of CSR activities

The evaluation of the various companies' sustainability disclosure will be in the form of a score assigned as follows:

Table 4-1 Sustainability Reporting Score card – full sample

Sustainability Disclosure method	**Assigned Category Score**
No website or mention in annual report	0
Section on website – general outline no specific initiatives outlined	1
Section on website – general outline with community / local initiatives	2
Section on website and in annual report (sometimes without specific goals or specific risk disclosure), inconsistent use of external standards such as GRI if at all	3
Section on website, in annual report and consistent adherence to GRI	5

It should be noted that the score is assigned as an average over the 2015 – 2019 period. A second more in-depth understanding of the extent to which ESG reporting is undertaken will be developed for companies assigned a score of "3" and "5". This is for a general understanding of what exactly is included in the disclosure of sustainability initiatives published periodically. While several companies seem to provide a lot of information about sustainability, an actual examination of the annual report and other periodically disclosed information (sustainability reports) – show that this is not necessarily the case. The scores will be defined in categories labelled "1" or "2" to distinguish between the level of details and the implications of the score are outlined in Table 4-2 below. The analysis from this report will be separate from the overall scoring analysis. In some cases, in lieu of GRI, companies use SASB (Sustainability Accounting Standards Board) standards which present the same details related to sustainability as per GRI requirements but to a more narrow audience (D'Aquila, 2018). Jean Rogers, the CEO of the SASB claimed to develop the actionable intelligence complimenting information in reports composed using GRI guidelines (Rogers, 2016). For simplification, this study has considered reporting using SASB to be under the same category as GRI standards. This has been also done by researchers working on the validity and relevance of both systems (D'Aquila, 2018; Eccles & Serafeim, 2013; Schoenmaker & Schramade, 2019).

Table 4-2 In-depth examination of Sustainability Reporting of Companies with assigned score of "3" & "5"

In-depth examination of period reports		Assigned Score
ESG related risks[1]	Annual Report / Sustainability Appendix or Report **clearly** states the way the company is handling and reducing ESG risks	2
	Unclear in terms of steps taken. Just general mentions of handling risks provided.	1
CSR	Clear Community initiatives Outlined – when, where and level of impact.	2
	General initiatives focused on the company's products as a continuation of better B2B relationship building. No specific details of what was done and where.	1

[1] Almost all annual reporting of sustainability has included the importance of dealing with risks. If the risks are generalized – product liability etc. - and not specific to ESG issues, they will be assigned "1".

GRI Standards[2]	Consistent and Specific Use of GRI standards throughout the years utilizing GRI specific outline	2
	Some adherence and emphasis on GRI standards in at least one year.	1

4.2.5 Goals of the Quantitative Study

The primary hypotheses of this study relate to an intersection between finance and marketing. The traditional marketing and relationship methods for B2B companies are not as valid as they used to be. The literature review has highlighted how various externalities – ESG awareness, government regulations etc. – affect the commercial landscape for B2B companies (Gualandris & Kalchschmidt, 2016; Krause, Handfield, & Tyler, 2007; Thresh Kumar et al., 2014). Customers at all levels, including decisionmakers in a B2B transaction, want authenticity and thus presentation of key facts and information (Galbreth & Ghosh, 2013; Joshi & Rahman, 2015). Whereas customers may have once been convinced to adopt a particular product or service because of an expensive advertising campaign, this is no longer the case (Bonn & Fisher, 2011; Diaz, 2013). Social media – websites, paid advertising on Facebook®, Instagram®, LinkedIn® - has become a very important of the planning method for developing brand image in all markets extending even to B2B sectors (Habibi, Hamilton, Valos, & Callaghan, 2015). The analysis of key financial indicators is to identify the trade off and institutional pressures that the companies face going forward.

[2] Companies that do not use GRI (and/or additional information per SASB standards) are assigned a "0" in the GRI Standards even if they undertook annual reporting of sustainability initiatives undertaken in some detail.

4.2.6 Outline of hypotheses related to analyzing the sample of publicly listed auto parts OEM suppliers

The importance of substantive financial reward or punitive financial costs as a key part of considering sustainability reporting drawing on key literature. Willard talked about how important it is to develop the backing of the board of a company by identifying tangible benefits to undertaking sustainability such as material efficiencies, higher income margin (Willard, 2012, 2020). Schoenmaker talked about the importance of investing in the company as represented by capital investment and business expansion to actually develop a systemic approach to sustainability initiatives (Schoenmaker & Schramade, 2019). Hörisch et al focused on the impact of firm size on being able to set aside resources to develop a consistent mechanism for sustainability reporting (Hörisch, Freeman, & Schaltegger, 2014a, 2014b; Hörisch et al., 2015). Thus, the hypotheses will focus on the possible connectivity between Sustainability Reporting and:

i. Firm size – defined by number of employees per latest figures from Automotive top 100 suppliers list
ii. Net income – adjusted for currencies by using Net Income Margin
iii. Operating expenses – adjusted for currencies by using Operating Expense Margin
iv. Inventory – as represented by inventory turnover ratio
v. Increase / decrease in investments (drawn from the Cash Flow statements) with two measures – the Net Property Plant & Equipment (comparison between 2015 versus 2019) & change in Net Investment Cashflow.
vi. Return on Equity compared to the S&P 500 10-year average return

The critical idea is to find the statistically significant, or lack thereof, connection between the above factors. This will lead to an understanding of what could motivate firms to develop better sustainability

and reliable ESG impact reporting. As will be explained further in the description of each hypothesis, each of these factors are geared towards a defined benefit or cost of undertaking sustainability disclosure.

Hypothesis related to firm size (H1):

H1: the level of observed disclosure of CSR, sustainability and ESG reporting could be affected by firm size.

A regression was run between the number of employees and the disclosure score to identify the key output. The p-value from the output will be considered. An ordinal logistic regression was considered the optimal approach for analysis. This draws from Gauthier's study that examined the impact of firm size in determining the level of sustainability reporting and disclosure (Gauthier, 2013). The firm size here is represented by number of employees due to the diverse nature of the value of products sold by the companies. Willard also examined the role that firm size played in company wide acceptance of the importance of consistent sustainability reporting (Willard, 2012, 2020).

Hypothesis related to net income margin (H2):

H2: Companies with higher net income margin will develop more detailed sustainability disclosure.

An overview of the net income margin data collated for the 2015 – 2019 using sparklines show that most of the data is skewed. This points to median being a better measure than mean for this hypothesis (log normal is not used because at least one data point for average net income margin is negative).

A regression can be done to develop the interconnection between the median net income margin over 2015 – 2019 period with the disclosure. Then the p value was considered in accepting or rejecting the null hypothesis. As the dependent variable is a categorical variable with the independent variable a continuous number, we can develop an ordinal regression analysis. The importance of net income is drawn from the

importance of having resources available after covering expenses as companies cannot sustain financially burdensome sustainability requirements which could drive them out of business (Hollos et al., 2012; Meinlschmidt et al., 2018; Yenipazarli, 2017).

Hypothesis related to operating expense margin (H3a and H3b):

H3a: Companies undertaking higher disclosure of sustainability show a corresponding higher level of operating expenses margin.

An examination of the table of the distribution of the operating expense margin for the years 2015 – 2019 for the sample concerned shows a highly uneven distribution. Since, there are, by definition, no negative numbers, the average expense margin can be converted to a log-normal value and a regression run to identify the strength of the relationship between higher disclosure of sustainability and corresponding operating expense costs identified as a margin of total revenue.

H3b: The country of jurisdiction affects the level of operating expense.

The log-normal of the average operating expense margin was again used for this analysis to develop a regression to test the strength of the relationship. A low p-value will indicate that there can be some conclusions drawn from the sample about how companies' operating expenses could be affected by their country of jurisdiction. As the independent variables in this case are categorical factors and the dependent variable is a continuous number, a best fit regression can be carried out using Minitab® to identify the strength of the relationship. This draws on Willard's work both in developing arguments that regular sustainability reporting may not incur as much costs as the company board might imagine (Willard, 2012, 2020).

Hypothesis related to inventory (H4a and H4b):

De Oliveira Neto et al and Demeter who in their respective papers stated that it is important for companies to be able to derive a direct benefit from undertaking sustainability initaitives. The "inventory" item in the balance sheet usually refers to more than just finished goods. It can be assumed that inventory turnover can also integrate the efficiency of turnaround of materials which are considered both direct and indirect parts of the production process (De Oliveira Neto et al., 2016; Demeter & Matyusz, 2011; Figge & Hahn, 2012).

H4a: firms with higher assigned disclosure scores show a higher average inventory turnover ratio.

A regression analysis was run with the log-normal of the average inventory turnover ratio as the dependent variable to understand whether it varies according to the assigned disclosure score as the indpendent variable.

H4b: firms that have adopted GRI standards have a higher average inventory turnover than those firms who have not.

The Mann-Whitney U test was used to compare the average inventory turnover between firms that undertake GRI reporting and those that do not.

Examination of net cash investments and changes in property plant and equipment (H5a and H5b)

Drawing on what the literature review stated about committing resources to sustainability, two aspects can be examined to develop an understanding of the level of actual commitment towards developing their business.

The first item that can be examined is investing cashflow from 2015 to 2019 for the selected sample. The average change in the investments made should be examined to understand whether the company is

expanding or is likely to have embarked on a spree of outsourcing production activities to low cost areas. This may provide us with an understanding of what the consequences could be for pressures being put on companies to become more sustainable goal compliant. All companies in the sample that have commenced GRI compliant reporting started in 2017. Thus, 2015 – 2019 can be the reasonable investment timeline to examine. The average change per year will be examined to compensate for the varying currencies of the financial reports of the sample.

H5a: firms that have adopted GRI standards show higher increase in investment related cashflow.

As with inventory turnover ratio, a Mann-Whitney test of the median of the change in investment related cashflow of the two groups of companies would be the most suitable considering the skewed nature of the data.

The second analysis that can be carried out is to identify the difference in net property plant and equipment from 2015 to 2019 using the "NPPE" item from the respective balance sheets. This is critical to understand the growth in physical facilities that the company can use to deal with environmental and other physical impact of operations.

H5b: firms that have adopted GRI standards show an average increase in NPPE in 2019 compared to 2015.

Return on Equity as determinant for future growth of sustainability reporting in the sector

Return on Equity is a popular measure used by investors to decide whether to keep their investments in a company or to divest and include other companies in their portfolio (Hagel J., Seely B. J., 2010). The S&P 500 ETF has averaged 13.04% over the last 10 years according to Yahoo Finance® ("SPDR S&P 500 ETF Trust (SPY)," 2020). This is a critical measure to monitor to develop an understanding of the financial

performance of the sector. The Return on Equity will be taken from 2012 the year the entire sector is considered to have fully recovered (Platt & Platt, 2013). First the average return per total assigned disclosure score and then by companies undertaking GRI standard reporting will be measured. The key finding is whether there is a discernable difference between the firms. If not, then it can be stated that investors are mainly interested in performance external to sustainability concerns. If the sector performance lags the S&P, this could be a harbinger of future issues with raising capital and might even signal future tightening of capital available to the sector.

H6: firms that have adopted GRI standards show a higher ROE than firms that do not.

In summary the following hypotheses will be examined:

Table 4-3 Hypotheses summary of study of sample

H1: the level of observed disclosure of CSR, sustainability and ESG reporting could be affected by firm size.
H2: Companies with higher net income margin will develop more detailed sustainability disclosure.
H3a: Companies undertaking higher disclosure of sustainability show a corresponding higher level of operating expenses margin.
H3b: The country of jurisdiction affects the level of operating expense.
H4a: firms with higher assigned disclosure scores show a higher average inventory turnover ratio.
H4b: firms that have adopted GRI standards have a higher average inventory turnover than those firms who have not.
H5a: firms that have adopted GRI standards show higher increase in investment related cashflow.
H5b: firms that have adopted GRI standards show an average increase in NPPE in 2019 compared to 2015.
H6: firms that have adopted GRI standards show a higher ROE than firms that do not.

4.2.7 Qualitative Examination of Sustainability reporting of Martinrea, Linamar and Magna – identifiers and sustainable value co-creation

After the financial overview of the selected sample, the study will examine the sustainability reporting and narration of corporate efforts by the three Canadian companies in the list. These three companies are the only publicly listed Canadian companies among the top 100 firms in this world. Various literature and press analysis on this auto parts sector identified that while the Canadian auto component manufacturing sector seems very consolidated, there are still a number of smaller firms who mostly supply to the large players and undergo increasing pressure to lower costs thereby affecting margins (Hatges & Brown, 2019; Sweeney & Mordue, 2017)

This section will deal with the bridging of financial metrics with the interaction of stakeholders in a company. The three Canadian companies have varying circumstances both financial and in terms of product range. Thus, this section will be critical in developing the application of stakeholder theory and institutional theory in developing an understanding of the how and why of sustainability reporting. Due lack of contact with the respective company external affairs department in the middle of the current crisis to identify whether they would be interested in helping by agreeing to interviews, the sources of information will be secondary drawing on the website materials and relevant news articles.

The processing of the information disclosed by the three companies will be analyzed using the Corporate Integration of Voluntary Initiatives for Sustainability (CIVIS) model proposed by Lozano in 2012 (Lozano, 2012). The model focuses on developing an understanding how corporate initiatives impact sustainability building on an earlier model that focused on the economic, environment, social and temporal perceived measures. The CIVIS model is a useful tool to apply to this study in that there is an inherent scoring system built into the framework allowing an evaluation of initiatives taken by the respective companies. In terms

of evaluating periodic reports such as news reports, annual reports, sustainability reports, etc. we will look at the 2017 – 2019 timeline. This framework is drawn on the work of many others before him and is a good summary of key techniques to look out for when evaluating a company's sustainability initiatives. The framework is outlined in the next page and an overview of the application of the framework to the qualitative study follows in the page after.

Table 4-4 Rodrigo Lozano's CIVIS Model

	Corporate System					Sustainability			
Corporate Initiative	Operations & production	Management & strategy	Organisational systems	Procurement & marketing	Assessment & communication	Economic	Environmental	Social	Time
Sustainable Livelihoods		3				3	3	3	3
The Triple Bottom Line		3		3		3	3	3	
The Natural Step		3	2			2	3	2	2
Environmental Management Systems		3	2		3		3		
Environmental & Social Accounting		3			3	3	3	3	
Life Cycle Assessment	3				3		3		
Cleaner Production	3					3	3		
Design for the Environment	3						3		
Eco-efficiency	3					3	3		
Industrial Ecology	3					3	3		
Factor X	3					2	3		
Green Chemistry	3						3		
Eco-labelling				3	3		3		
Corporate Social Responsibility		3			2		2	3	
Sustainability Reporting		2			3	2	1	1	
Corporate Citizenship		3						3	

Score Assigned Instead of Color Coding

Full contribution	3
Limited contribution	2
Variable contribution	1

The following outlines the key points of information sought in the materials available related to the three firms from various news articles and from the company sites:

Table 4-5 Information outline of CIVIS model's corporate initiatives

Corporate Initiative	Information points sought
Sustainable Livelihood	• Details of in-depth relationship with local partners to develop both business interests and the interests of the local community their business affects. • Identification of whether an equal emphasis is placed on environment and social aspects with an eye on going above and beyond local laws.
The Triple Bottom Line	• Explicit stated and detailed social and environmental metrics as part of their annual reporting on a regular basis along with financial factors – separate from sustainability reporting using external standards.
The Natural Step	• Information about material flows in relation to both extraction and pollution • Information about operational effects on bio-systems • Information on communities where they can be affected by company operations • Development of systems designed to remedy adverse effects and prevent further degradation This framework was specifically by The Natural Step – an NGO of Swedish origin
Environmental Management Systems	• Information on impact on the environment by the company's business activities • Undertakes evaluation of current and future legal obligations • Develop plans and assign responsibility Develop a monitoring mechanism of progress or identify future issues Example of such systems: ISO 14001 certification
Environmental and Social Accounting	• Company assigns value to biosphere resources used • Management committee or taskforce focusing on identifying the value of natural resources used • Outline of decisions based on such valuations
Life Cycle Assessment (LCA)	Clear identification of LCA mechanisms or requirements for business operations or sourcing
Cleaner Production:	• Strategy outlines to reduce material impact • Plans to develop zero emissions business activities
Design for the environment	• Plans and policies for identifying impact on the environment • Plans to address outcomes of studies
Eco-efficiency	Plans and measures to address: • Dematerialization

	• Zero waste in production • Extended use products • Multi-use products The key consideration is to understand the tradeoff between positive ESG impact and economic impact on the company.
Industrial Ecology	• Plans to restructure current production and other business processes to significantly reduce adverse material and social impact • Definition the entire production process within context of the environmental and social impact instead of being independent of it
Factor X	Factor X relates to initiatives developed by the Wuppertal Institute. Currently known as Factor 10, the focus is on developing a support structure for designing sustainable value creation. This is geared towards developing greener products.
Green Chemistry	Plans for developing materials processing techniques to significantly reduce waste at every stage of production with outlines and projections of waste saved.
Eco-labelling	Has a system of marketing their products using an accepted format for labeling the ESG impact of their products, Fairtrade etc.
Corporate Social Responsibility	Outlines of community outreach to develop positive image of company as well as a strong relationship with political and social players in the relevant geographic region of operations.
Sustainability Reporting	Use of a system like GRI or SASB to develop standardized annual reports on ESG impact
Corporate Citizenship	Abiding by legal and regulatory requirements.

The information framework does outline several overlapping information points that could make it difficult to categorize the information provided in the various materials. In his 2012 article outlining the CIVIS model, Lozano states that no single initiative covers the range of impact that a company would need to develop to become a strongly ESG positive company (Lozano, 2012). He states that all companies should seek to develop the optimal combination that saves on resources and yet provides the highest possible impact. The information drawn will be combined with the framework as outlined in Table 4-4 to develop an understanding of actual impact and potential redundancies in developing positive ESG impact.

4.3 Outline of results sought

4.3.1 Overview of the sector

There needs to be a general understanding of the current state of the sector. This overview seeks to understand the nature of the fragmentation of the sector. This can be drawn from the sales figures from the Automotive top 100 list. A comparison of the market share of the top firms compared with an estimate of the entire sector is important to understand the potential for future strategic decisions by the companies. Various overview undertaken by analysts have found that there has been a strong trend of consolidation over the last decade after the 2008 financial crisis both in the auto manufacturing sector as well as the auto OEM parts manufacturing sector as with many other large industrial sectors (Hatges & Brown, 2019; Oh & Rhee, 2008; Platt & Platt, 2013; Standard & Poors, 2018). This will provide a better context to the financial data to be analyzed.

4.3.2 Quantitative Study

The results of the research will be highlighted in concluding tables that seek to develop the validation or rejection of the hypotheses generally outlined above. The hypotheses seek to answer the question of the correlation between the culture of disclosure of the companies in the sector with business success or whether ESG disclosure could lead to business risk for the company. The study also seeks to answer if the company has attained material efficiency as they develop better ESG disclosures by showing declining levels of inventory. It is also important to identify whether the company has increased its investment to

develop a bigger footprint as the company has become more involved in ESG reporting as part of its regular business activity.

4.3.3 Qualitative Study

Drawing from the sector analysis, the three Canadian auto parts company's financial performance in relation to the rest of the sector can be thoroughly analyzed. Lozano's CIVIS model will give us a score that can be compared with the financial metrics of the company. This will allow an understanding of how efficiently the three Canadian companies in the sample have developed sustainability initiatives and potentially how efficient is the initiatives' impact.

4.4 Limitations of the study

The following are potential issues with the selected methodology in terms of affecting the validity of results.

i. **Use of third-party Yahoo Finance® data:**

   The study relies on downloaded data from Yahoo finance sources. The data is standardized to a set format thereby allowing comparison across time periods between companies. This may have required the collators of the data to make modifications for varying reporting time periods and across geographic reporting jurisdictions.

ii. **Use of company reports and materials on websites:**

   While some news websites were referred to, most of the information regarding sustainability initiatives were gathered from the company website, annual reports and verified through the GRI

website report on adherence to GRI. While there was a clear distinction made between companies that used some external standardized method to report sustainability and those companies that did not, most of the information relied on was collected from the company website. While many countries and international stock exchanges have laws and regulations respectively requiring the validity and relevance of published data, many companies will have undoubtedly presented inflated value of the importance of their sustainability initiatives and the positive nature of their general ESG impact.

iii. Lack of standardized measures of ESG impact due to Corporate Social Responsibility (CSR) initiatives across boundaries

While many companies try and adopt external standards, there is no single method that can show a direct quantitative comparison between companies. The GRI standard is thus very important and that itself has not been adopted by many companies in measuring their business process impact. This is particularly important in defining what the actual impact has been for CSR activities undertaken by the companies.

iv. Variation of cultural and national priorities across the sector

One interesting point that was identified when examining sustainability initiatives was the varying nature of the company identified attributes as they relate to the country specific identity of the companies. This goes beyond issues with translation of the written material on the importance of social and cultural initiatives. The context of several initiatives undertaken can vary significantly and the impact difficult to measure as the importance may not be properly realized by researchers outside the country.

Chapter 5 Findings

This chapter will first provide an overview of the sector based on the Automotive top 100 auto component manufacturers list by sales. This section is key in providing a context in which the companies in the selected sample operate. The distribution of ownership – public and private – will be examined. The general geographic distribution of sales will be highlighted. The next few sections will look at the level of the sustainability disclosure and reporting by companies in the sample – all publicly listed companies. The quantitative analysis will relate specific financial measures to the level disclosure thereby trying to find a discernable pattern in financial health between companies that undertake sustainability reporting. Finally, Lozano's CIVIS model will be used to examine the three Canadian companies in the sample as outlined in the methodology.

5.1 Overview of the top 100 companies in the sector – Automotive News Top 100 by sales

5.1.1 Ownership of supply chain companies – public and private

One critical point in developing an understanding of the institutional forces towards developing sustainability is to look at the nature of ownership of the companies. Many companies are publicly listed but there are a significant number of the companies which have been found to be privately held. This information was collected by looking up their profile on Yahoo Finance© and thus confirming their listing, or lack thereof, in various stock markets around the world. Of the top 100, 43 of the companies were found to be privately held and the remaining 57 are publicly listed companies. This means that there is a

near even split between public and private ownership of the companies. The composition of sales as per the 2018 list shows an even more interesting division as per total revenue from parts sales in 2018.

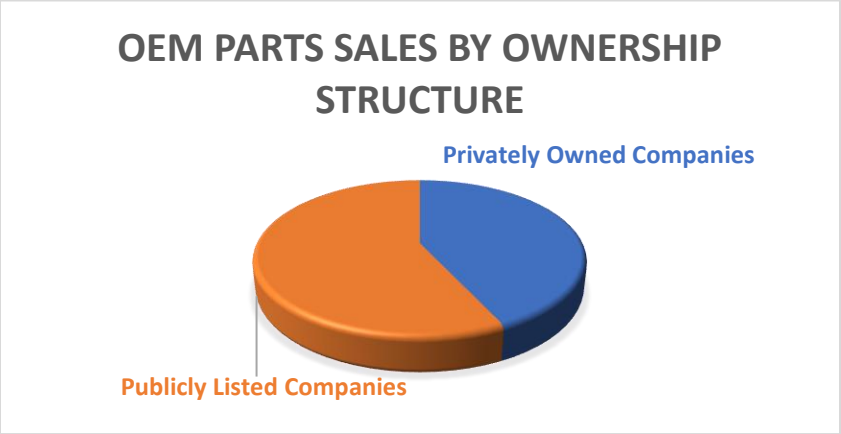

Figure 5-1 Division of sales by ownership structure per Automotive News Top 100 list

This follows the analysis made by several industry intelligence firms and other researchers that while consolidation is happening, it is also becoming very expensive to acquire target firms (Chappell, 2019; Holmes et al., 2017; Reeves, Caliskan, & Ozcan, 2010). Public firms face greater pressure on sustainability. However, if an increasing portion of their competition are private firms that are not subject to the same level of demand from stakeholders for sustainable initiatives, the potential reward for undertaking sustainability is much less. This is especially true in a business to business focused industry.

5.1.2 Geographic distribution of sales

The following graph shows a rather lopsided sales distribution with the bulk of the auto component manufacturing happening with firms based in Germany and Japan. One key caveat in this graph is that it is rather difficult to develop and understanding of how much of the production process was outsourced to secondary and tertiary contracting firms in other countries. This has implications in terms of the actual ESG impact that is relevant to an analysis. It is worth examining whether more firms from each country have developed a more comprehensive approach to reporting ESG impact and sustainability initiatives.

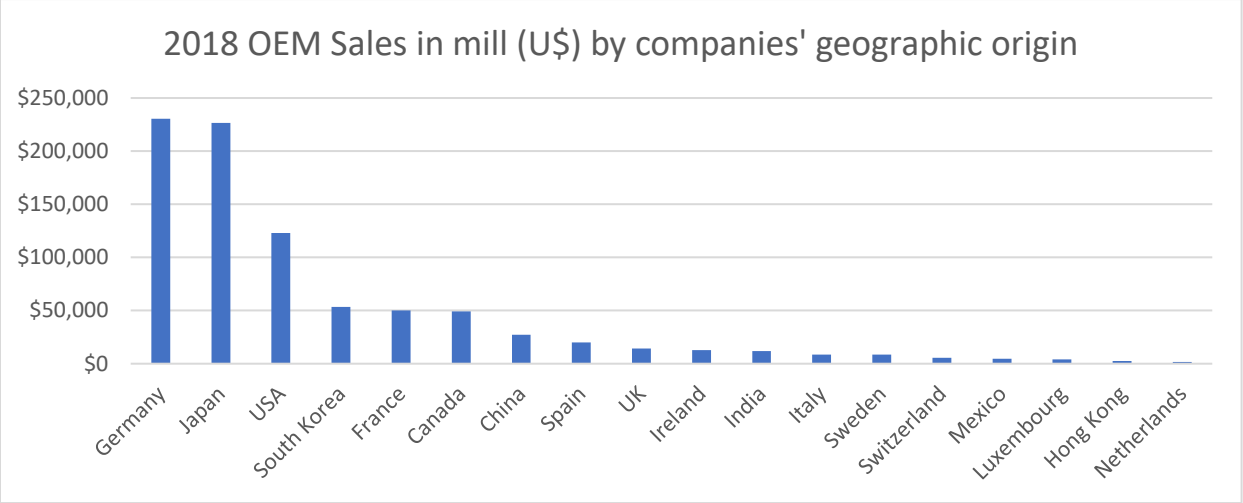

Figure 5-2 OEM parts sales by company's geographic origin

While Germany and Japan have strong reporting requirements, it could be that many firms in these two countries are the originators of the technology that is then transferred to other locations to manufacture critical components for their customers. Thus, the next question becomes how much of the issues on the ground at various global locations are recorded in the respective annual reports of the companies. One way this study seeks to compensate is by integrating other supplier companies from WardsAuto.com

provided on request. The list includes key names of supplier firms that are major players in the auto parts and other vehicle components sector but are not included in the Automotive News top 100.

5.1.3 Distribution of sales among firms

The following graph is an illuminating illustration of how fragmented the industry is currently as per the listing from Automotive News top 100.

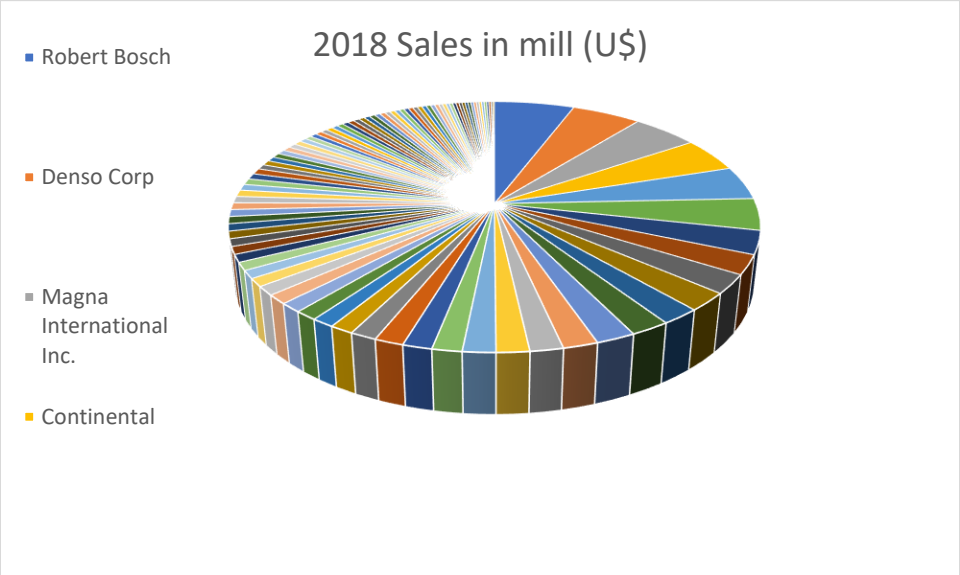

Figure 5-3 OEM Parts sales by company

No single firm has been found to have beyond a 6% share. This, while not providing a comprehensive picture of all firms in the world, shows that no single firm has been able to dominate the sector even after considerable mergers and acquisition activities yet. This could point to significant indirect control that auto manufacturing firms have on the business strategy of downstream value chain companies. With the auto manufacturing sector dominated by a few key players, this could very well be true.

5.2 Sample Analysis

5.2.1 Geographic Distribution & size of firms

The selected sample dimensions and the assigned scores for the two evaluation of sustainability reporting are given in Appendix II.

Table 5-1 Listing Country Jurisdiction of Sample

Reporting Jurisdiction	Number of Firms
Brazil	1
Canada	3
China	8
France	4
Germany	4
Hong Kong	1
India	2
Ireland	1
Japan	25
South Korea	3
Spain	1
Sweden	1
Switzerland	2
Taiwan	1
Thailand	1
Turkey	1
US	8
Total number of firms:	67

The table above lists the countries under which the companies have been profiled as having been headquartered. This list comes with some critical caveats – operational reach goes way beyond the specific country where the website states that the companies are located. Also, some companies are listed in countries other than where their headquarters are situated. A significant number of the companies have been bought, sold, and bought again through the tumultuous second decade of the century. Thus,

the best way to develop an understanding of the financial health and sustainability is to narrow down as per the filing and reporting requirements of the country their shares are listed in.

Table 5-2 Firm Size Distribution

Size of firms in terms of employees			Number of firms
	Up to	500	2
501	to	1,000	0
1,001	to	5,000	5
5,001	to	10,000	9
10,001	to	25,000	17
25,001	to	50,000	16
50,001	to	100,000	8
	More than	100,001	10

The table above shows that the highest number of companies shows that consolidation has made the sector start leaning towards large sized firms absorbing smaller firms. This is expressed very clearly in the graph below:

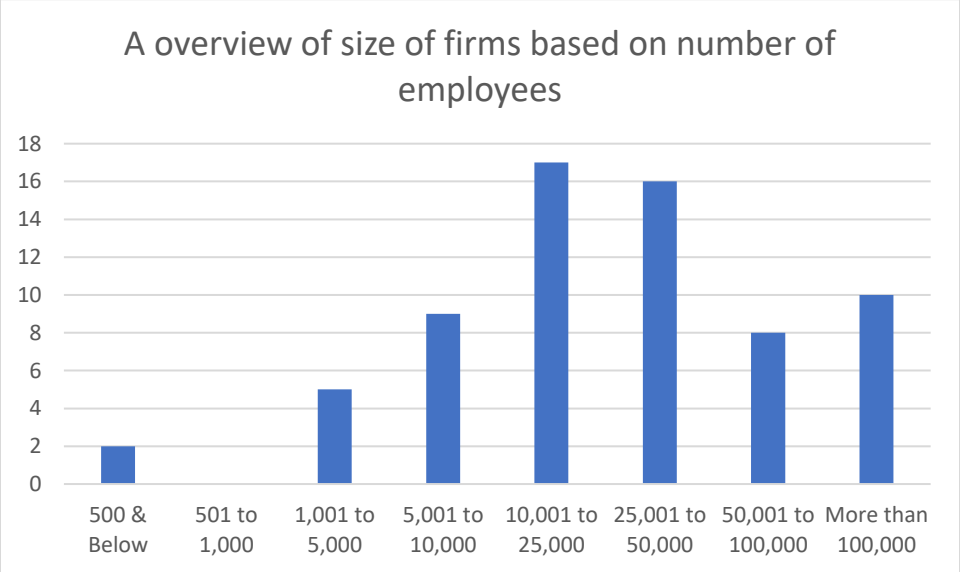

Figure 5-4 Distribution of Sample by Firm Size

This insight is important considering the resources that the sector should have when developing sustainability reporting. It is also important for relevant stakeholders and activists to understand the level

of consolidation in negotiations to set the sustainability reporting requirements. One issue brought up frequently by opponents of strong reporting of sustainability reporting is the undue burden it places on smaller companies (Aguilar-Fernández & Otegi-Olaso, 2018; Boerner, 2011). This analysis, while drawing on a sample, nonetheless shows that this is going to become less of an issue as companies become larger by mergers and acquisitions and thus can allocate more resources towards developing sustainability resources and reporting in this sub-sector.

5.2.2 Distribution of Scores

Table 5-3 Distribution of Sustainability Scores by Country

	Sustainability Scores by Country					
Countries	**0**	**1**	**2**	**3**	**5**	**# of companies**
Brazil				1		1
Canada			1	2		3
China	2	1	4		1	8
France				2	2	4
Germany			1		3	4
Hong Kong			1			1
India		1	1			2
Ireland				1		1
Japan			8	8	9	25
South Korea			2		1	3
Spain			1			1
Sweden					1	1
Switzerland				1	1	2
Taiwan		1				1
Thailand				1		1
Turkey	1					1
US			1	6	1	8
Total per score level	**3**	**3**	**20**	**22**	**19**	**67**

An initial summary of the assigned disclosure scores distributed by country shows some interesting patterns. First, due to the availability of complete data for the years concerned, the number of Japanese companies are highest in the sample. Japanese companies also have, by far, the highest number of companies with a complete year to year reporting of sustainability initiatives. However, the distribution of scores is quite even with not all companies undertaking comprehensive sustainability reporting in their annual reports. This points to the fact that even in a country where researchers identify has such an important emphasis placed on sustainability over the last two decades, not all companies feel the need to develop regular sustainability reporting (Bansal, P. and Roth, 2000; Laskar, 2018). This is a key point that will be returned to in the discussions.

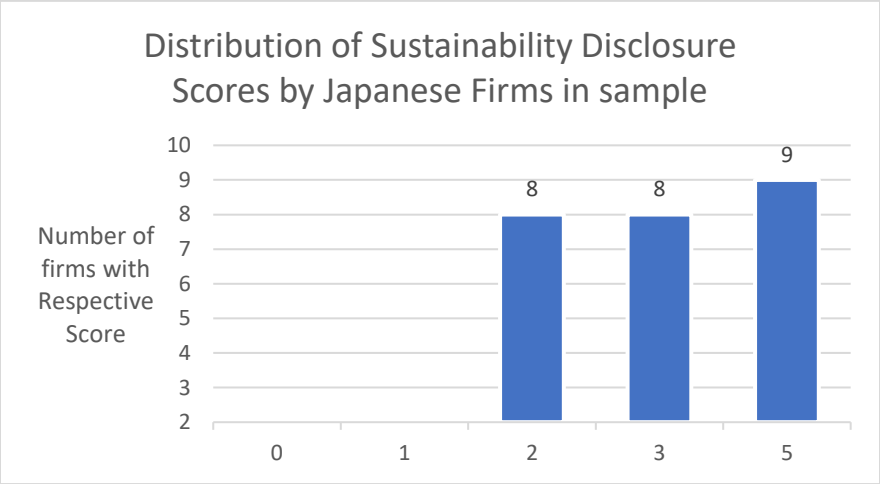

Figure 5-5 Distribution of Scores for Japanese firms - the largest country of jurisdiction in the sample

Germany is another country that shows a skewness towards higher levels of reporting related to sustainability. However, this is a very small sample of the myriad German firms involved in this sector. Many are privately owned and do not easily disclose information to all stakeholders (Pavlínek, 2015; Singh, Sharma, & Garg, 2016). Another pattern in the sample is that US firms selected do not have a consistent reporting mechanism. This, and a similar pattern for Canadian firms in the sample, could point to issues

with the business reputation and financial factors that induce and reward consistent sustainability reporting.

Further insights are obtained when we look at which companies have developed consistent sustainability reporting using the GRI Framework and what they have outlined in their respective materials on ESG impact. A second set of scoring was undertaken on companies who undertook periodic reporting (annual report, addendum to annual report or separate report altogether) on sustainability. The interesting aspect was that even though many reports were titled “sustainability” there were a variety of initiatives that was presented under this heading. While sustainability is a holistic approach, in a few cases the actual initiatives was more related to development of positive corporate image – CSR – rather than identifying what exactly the company committed to undertaking to develop a positive ESG impact. In short, this was more an exercise in brand development rather than actual sustainability reporting for those companies. As reported in the literature review, multiple researchers have identified CSR and sustainability initiatives as a critical part of B2B marketing (Habibi et al., 2015; Mariadoss et al., 2011). The summary of the scores and the score legend is provided on the next page.

Table 5-4 In-depth examination of disclosure reporting of companies with score of "3" and "5"

Stock Code	ESG Risk	CSR	GRI	Stock Code	ESG Risk	CSR	GRI
7276.T	1	1	0	6995.T	2	2	1
BWA	1	1	0	7259.T	2	2	1
LNR.TO	1	1	0	AH-R.BK	2	2	1
5105.T	1	2	0	DNZOY	2	2	1
APTV	1	2	0	GNTX	2	2	1
AXL	1	2	0	NJDCY	2	2	1
LEVE3.SA	1	2	0	WEICY	2	2	1
VC	1	2	0	VLEEY	1	2	2
6472.T	1	1	1	012330.KS	2	2	2
EO.PA	1	1	1	7282.T	2	2	2
TEL	1	1	1	ALV	2	2	2
5191.T	1	2	1	ASGLY	2	2	2
DAN	1	2	1	AUTN.SW	2	2	2
LEA	1	2	1	CPS	2	2	2
MGA	1	2	1	CSTM	2	2	2
POM.PA	1	2	1	CTTAY	2	2	2
APELY	2	1	1	IFX.DE	2	2	2
3116.T	2	2	1	NPSKF	2	2	2
5801.T	2	2	1	OMRNY	2	2	2
6473.T	2	2	1	SHA.DE	2	2	2
				SMTOY	2	2	2

Table 5-5 Score Legend for Table 5

In-depth examination of period reports		Assigned Score
ESG related risks	Annual Report / Sustainability Appendix or Report clearly states the way the company is handling and reducing ESG risks	2
	Unclear in terms of steps taken. Just general mentions of handling risks provided.	1
CSR	Clear Community initiatives Outlined – when, where and level of impact.	2
	General initiatives focused on the company's products as a continuation of better B2B relationship building. No specific details of what was done and where.	1
GRI Standards	Consistent and Specific Use of GRI standards throughout the years utilizing GRI specific outline	2
	Some adherence and emphasis on GRI in at least one year.	1

Some key findings can be highlighted here:

i. 80% of the companies that undertake annual reporting of sustainability use the GRI standard at least in part. Some of these companies have been slow to adopt the GRI standard but nonetheless a standardized mechanism could be useful in inducing companies to report sustainability.

ii. 33 firms show adherence to GRI in part or whole throughout the years examined (and in some cases, for example Magna International, using SASB specified standards that also adhere to what GRI outlines as important in considering sustainability of the company).

iii. All the companies undertaking annual reporting of sustainability use it to highlight positive CSR messages which may or may not include substantive information about the specific initiatives undertaken. This points to the importance of a standardized reporting system.

iv. 60% of the companies disclosing ESG related risks do so in some detail in their annual reports. Other companies just provide a general overview of company philosophy and approaches.

One key takeaway is that companies which regularly report using the GRI standards consistently report how they deal with ESG risks in addition to promoting CSR activities. This is an important finding in that as companies adopt GRI reporting, the awareness of ESG risks could contribute to lower liability and risk management costs in the long run. The key question is whether such detailed reporting throughout their business processes can be undertaken under significant market pressures faced by the companies.

5.2.3 Hypothesis testing results

The key data for the hypothesis testing is provided in Appendix III.

Hypothesis related to firm size

The following is the result of the ordinal logistic regression analysis using number of employees to represent firm size as the independent variable and the Assigned Disclosure Score as the dependent variable.

Table 5-6 Ordinal Logistic Regression Table for Assigned Disclosure Score (y) as determined by Firm Size (Num of Employees) (x)

Variable	Coefficient	Standard Error	Z	P
Num of Employees	-0.0000158	0.0000053	-2.99	0.003

The log-likelihood is -84.941 with a p-value of 0.0003. We can reject the null hypothesis that assigned disclosure score is not affected by the firm size in the sample.

Hypothesis related to net income margin

The following is the result of the ordinal logistic regression analysis using median of Net Income Margin and the Square of median of the Net Income Margin as the respective independent variables with the assigned disclosure score as the dependent variable.

Table 5-7 Ordinal Logistic Regression Table for Assigned Disclosure Score (y) as determined by Net Income Margin (x)

Variable	Coefficient	Standard Error	Z	P
Constant (1)	-2.9948	0.709879	-4.22	<0.0001
Constant (2)	-2.11057	0.547534	-3.85	<0.0001
Constant (3)	0.06732	0.412934	0.16	0.87
Constant (4)	1.54093	0.442217	3.48	<0.0001
Median of Net Inc margin	-22.1211	9.54035	-2.32	0.02
Median of Net Inc margin*Median of Net Inc margin	115.204	39.9221	2.89	0.004

The log likelihood is -86.452 with a p-value of 0.008. We can reject the null hypothesis and state that net income margin does affect the level to which companies undertake disclosure of sustainability in the sample. It also shows that it is more likely that the relationship between the assigned disclosure score and the net income margin is a quadratic one.

Hypotheses related to operating expense margin

The following is the result of the regression analysis using Assigned Disclosure Score as the independent variable and the corresponding log-normal of the operating expense margin as the dependent variable. The log-normal of the operating expense margin has been used to develop a normal distribution of the data.

Table 5-8 Regression Analysis of Assigned Disclosure Score (x) versus Log-Normal of Operating Expense Margin (y)

Variable	Coefficients	Standard Error	t Statistic	p-value
Constant	-2.494318246	0.16406889	-15.20287148	<0.0001
Assigned Disclosure Score	0.079583953	0.048843046	1.629381429	0.108069585

With a p-value greater than 0.05 for Assigned Disclosure Score, we cannot reject the null hypothesis. The next question that we can ask ourselves is whether the operating expenses are affected more by the country of jurisdiction.

The summary statistics for the average operating expense margin of various companies by country of jurisdiction are as follows:

Table 5-9 Descriptive Statistics of Companies by Country over 2015 - 2019 period

Country of Jurisdiction	Number of Companies	Mean Operating Expense Margin	Standard Deviation	Variance	Coefficient of Variation
Brazil	1	0.1655	*	*	*
Canada	3	0.0649	0.00943	0.00009	14.53
China	8	0.1180	0.0337	0.0011	28.57
France	4	0.0750	0.0281	0.0008	37.39
Germany	4	0.1893	0.0336	0.0011	17.74
Hong Kong	1	0.1727	*	*	*
India	2	0.3194	0.0852	0.0073	26.68
Ireland	1	0.0795	*	*	*
Japan	25	0.1153	0.058	0.0034	50.3
South Korea	3	0.0638	0.0221	0.0005	34.57
Spain	1	0.3139	*	*	*
Sweden	1	0.1173	*	*	*
Switzerland	2	0.3230	0.219	0.048	67.83
Taiwan	1	0.2468	*	*	*
Thailand	1	0.0378	*	*	*
Turkey	1	0.0250	*	*	*
US	8	0.0802	0.02483	0.00062	30.95

One clear finding is apparent in the table above. The difference in operating expense margin between company to company within a country is wide and does not seem follow a discernable pattern for the few countries where there is a greater number of firms as per the sample. We then look at a regression analysis of whether the country of jurisdiction affects the operating cost margin.

The first stage of the regression required the assignment of codes to represent the country. Then the operating expense margin, as before, was converted into a log-normal version. The results of the best fit regression analysis are as follows:

Table 5-10 Regression Analysis of Operating Expenses Margin (y) by country codes (x)

Variable	Coefficients	Standard Error	t Statistic	p-value
Intercept	-2.074496494	0.151883729	-13.65845116	<0.0001
Country Code	-0.020505054	0.015584166	-1.315762003	0.192875853

With a very high p-value it shows that operating expenses do not, with statistical significance, depend on the country of jurisdiction of the company. The conclusions that can be made is that neither disclosure level nor country specific costs may affect the business operating costs. A significant number of products are produced with set direct and overhead costs. This could be independent of externalities to the actual production process. With more negotiating power in the hands of the c, the supply chain player may not have much ability to control and develop a favorable cost structure beyond outsourcing or severe internal costs control thereby ensuring that no more than a certain level of revenue is spent. This has critical implications for developing sustainability reporting as will be discussed.

Hypotheses related to inventory turnover ratio

The results of the regression using assigned disclosure score as the independent variable and the log-normal of the average inventory turnover ratio (2015 – 2019) as the dependent variable are as follows:

Table 5-11 Regression of Assigned Disclosure Score (x) versus the ln of average inventory turnover (y) during 2015 – 2019

Variable	Coefficients	Standard Error	t statistic	p-value
Intercept	2.300967515	0.12130121	18.9690401	<0.0001
Assigned Disclosure Score	-0.001869423	0.036111176	-0.05176853	0.958871896

A p value of greater than 0.05 for assigned disclosure score means we cannot reject the null hypothesis and thus inventory turnover is seemingly not connected to developing sustainability disclosure within the company.

We develop two groups of companies from the sample. One group has adopted GRI reporting and the other has not. In the sample, 33 firms have adopted GRI reporting while 34 have not in any form. We assign the median of the first group as n1 and of the second as n2. The hypotheses are as follows:

H_0: n1 – n2 = 0

H_1: n1 – n2 > 0

Undertaking a Mann-Whitney test for difference in median gives us:

Table 5-12 Mann-Whitney test for GRI Non-GRI firms comparing median Inventory Turnover Ratio

W-Value	P-Value
1113	0.5470

The high p-value shows that there is no statistically significant conclusion can be drawn about the difference in the inventory turnover ratio between the two groups. The discussions chapter will expand on why this might be the case.

Examination of investment related cashflow and net property plant equipment (NPPE)

We can undertake another Mann-Whitney test to compare whether there is a difference between the increase in investment related cash between companies that have undertaken GRI reporting versus companies who have not adopted GRI reporting. As before, n1: median change in net cash investment by companies undertaking GRI reporting and n2: median change in net cash investment by companies not having undertaken GRI reporting.

The hypothesis are as follows:

H_0: n1 – n2 = 0

H_1: n1 – n2 > 0

The Mann-Whitney test for difference in median gives a p-value greater than 0.05.

Table 5-13 Mann-Whitney test of change in Investment related Cashflow by GRI reporting

W-Value	P-Value
1210	0.136

This shows that there is no statistically definitive conclusion that can be made in terms of investment related cashflow undertaken by the two sub-groups.

If we look at the descriptive statistics of the average net increase/decrease in cashflow investments, some other interesting conclusions can be drawn.

Table 5-14 Descriptive Statistics of Average Increase/Decrease in Investment Related Net Cashflow

	Did not undertake GRI Reporting	*Undertook GRI Reporting*
Mean	-2.65993722	-0.29539872
Standard Error	1.926377345	0.283199358
Median	-0.376865397	-0.370298953
Standard Deviation	11.23261363	1.626856452
Sample Variance	126.171609	2.646661917
Kurtosis	30.80153139	13.43509773
Skewness	-5.468079753	1.3323877
Range	65.85270829	12.27849336
Count	34	33
Confidence Level(95.0%)	3.919244178	0.576858215

What is interesting is that the companies that undertook GRI reporting seems to be have reduced investments by much lower average than firms that do not undertake GRI reporting. This could be an

indicator of operational efficiency or it could be that these large companies are increasingly outsourcing their production. The companies that do not undertake GRI reporting face significant cost pressures and thus are reducing their in-house production by much higher levels. While the variation between firms in the respective sub-groups seems to be very high, it can still be deduced that firms that undertake GRI reporting are those firms with more monetary resources available because of their sheer size even within the context of a very fragmented sector across the world.

When examining the change in Net Property Plant and Equipment from 2015 to 2019, we notice a similar situation where disclosure of sustainability does not follow a correlation with assigned sustainability disclosure score or GRI reporting.

Table 5-15 Descriptive Statistics of change in Net Property, Plant and Equipment (NPPE)

	Did not undertake GRI Reporting	*Undertook GRI Reporting*
Mean	0.532279317	0.370875434
Standard Error	0.139161999	0.05826524
Median	0.216890382	0.331370351
Standard Deviation	0.811446923	0.334708323
Sample Variance	0.658446109	0.112029662
Kurtosis	7.223648814	-0.101892663
Skewness	2.346483989	0.64325295
Range	4.030822175	1.288436412
Count	34	33
Confidence Level(95.0%)	0.283127216	0.118682411

The descriptive statistics for change in NPPE also show a significant variation within each grouping while overall there seems to be a similar change from 2015 to 2017. A two-sample t-test with the following hypotheses:

Null hypothesis	H_o: $\mu_1 - \mu_2 = 0$
Alternative hypothesis	H_1: $\mu_1 - \mu_2 > 0$

μ_1: Average change in NPPE for companies undertaking GRI reporting; μ_2: Average change in NPPE for companies **NOT** undertaking GRI reporting

Table 5-16 Two sample t-test for NPPE by GRI reporting

T-Value	DF	P-Value
-1.07	44	0.855

A p-value greater than 0.05 means we cannot reject the null hypothesis. This implies that there is no definable statistical distinction between the two categories of firms in terms of change in NPPE which matches the descriptive statistics. These findings will be discussed further in the next chapter as they can relate to how companies could be reporting on sustainability but not including the entire purview of operations.

Analysis related to Return on Equity (ROE)

An outline of the descriptive statistics by first assigned disclosure score and then by whether the company has undertaken GRI reporting or not is given below.

Table 5-17 Return on Equity by Assigned Disclosure Score

Descriptive Statistics	*Score 0*	*Score 1*	*Score 2*	*Score 3*	*Score 5*
Mean	0.20877	0.06656	0.08210	0.16617	0.16396
Standard Error	0.08882	0.05223	0.05338	0.02305	0.04200
Median	0.12597	0.09325	0.11348	0.15160	0.10619
Standard Deviation	0.15383	0.09046	0.23871	0.10811	0.18307
Sample Variance	0.02366	0.00818	0.05698	0.01169	0.03352
Kurtosis	N/A	N/A	14.96656	1.31527	6.04248
Skewness	1.72043	1.21183	-3.51498	1.02000	2.61571
Range	0.27219	0.17492	1.27895	0.43266	0.67522
Count	3	3	20	22	19
Confidence Level (95.0%)	0.38214	0.22472	0.11172	0.04793	0.08824

Table 5-18 Return on Equity by GRI reporting

Descriptive Statistics	*Undertaken GRI Reporting*	*Did not undertake GRI reporting*
Mean	0.15194	0.12426
Standard Error	0.02566	0.03545
Median	0.10619	0.13019
Standard Deviation	0.14739	0.20672
Sample Variance	0.02173	0.04273
Kurtosis	8.93459	16.66880
Skewness	2.86561	-3.23560
Range	0.70456	1.31425
Count	33	34
Confidence Level (95.0%)	0.05226	0.07213

The tables above enable us to draw out some key information. Companies that undertake GRI reporting and other annualized accounting of sustainability have a higher return on equity in general than firms that do not. The higher ROE among the firms that do not undertake reporting is skewed by the three firms that do not provide any information about their companies other than the bare required regulatory filing. These three firms have a higher mean ROE than the combined ROE of the firms that undertake GRI reporting. A t-test of the Return on Equity with the following hypothesis yields an inconclusive result.

μ_1: Mean ROE of firms that have undertaken GRI Reporting

μ_2: Mean ROE of firms that have not undertaken GRI Reporting

Null hypothesis	H_o: $\mu_1 - \mu_2 = 0$
Alternative hypothesis	H_1: $\mu_1 - \mu_2 > 0$

Table 5-19 Two sample t-test of mean ROE between firms that have undertaken GRI reporting versus firms that have not

t-Value	DF	p-Value
0.63	59	0.265

The key takeaway from this analysis is that the return on equity in this sector matches the 10-year annualized average of the S&P currently at 15.3% for firms that undertake GRI reporting. As will be

discussed later, companies may not be willing to undertake serious changes in how they do business which might affect the return they offer to shareholders in a very competitive capital market. The auto sector was facing a grim outlook resulting from the uncertainty in world trade and investment even before the COVID crisis (Hatges & Brown, 2019).

5.3 Qualitative Study of the three publicly listed Canadian companies in the sample

5.3.1 General Financial metrics

The following chart shows the sheer difference in size of the companies.

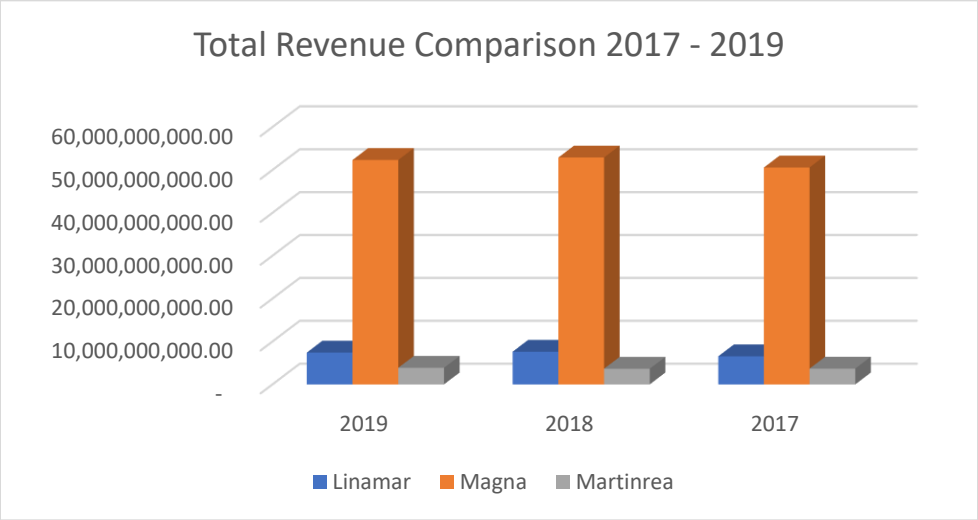

Figure 5-6 Total Revenue Comparison 2017 – 2019

This pattern is repeated in Net Income and Operational Expenses categories. However, we get interesting results should we compare inventory turnover and return on equity.

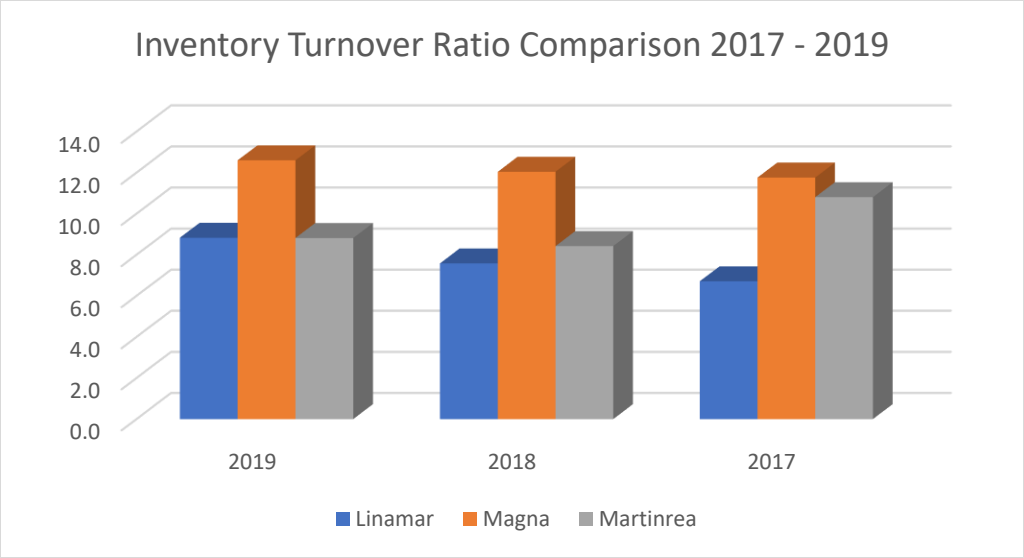

Figure 5-7 Inventory Turnover Comparison 2017 - 2019

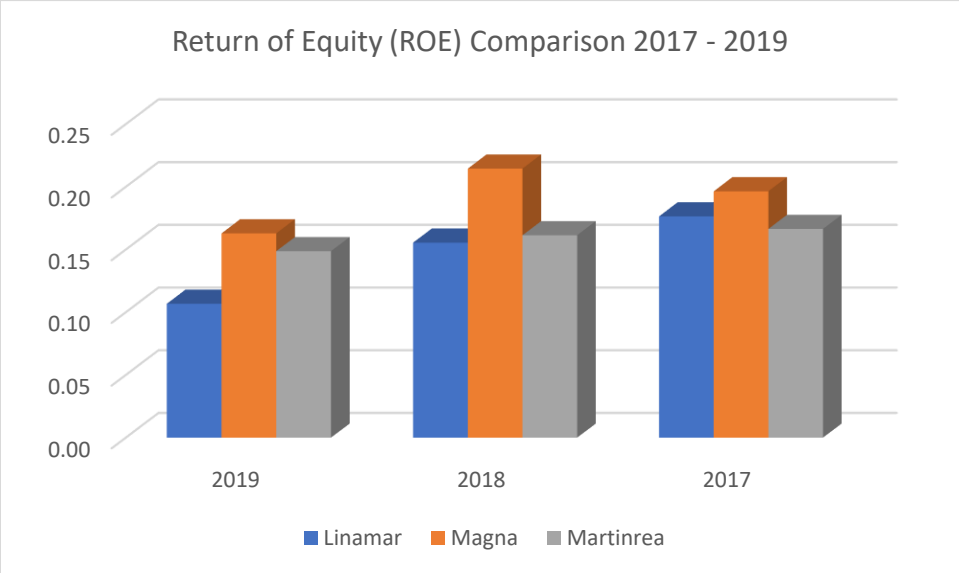

Figure 5-8 Return on Equity (ROE) Comparison 2017 – 2019

This second chart shows that even though Magna International is a massively larger company, the inventory turnover ratio is similar. The third shows that while Magna has a higher return on equity, it is not different by much compared to the other two Canadian companies. As will be discussed further in the next chapter, this means that no matter the scale of the companies, they face similar financial pressures in terms of how much they can profit considering the nature of the auto OEM component sector.

5.3.2 Lozano's CIVIS applied to each Canadian company in the sample

Note: the scoring tables in this section will not be captioned.

Sustainable Livelihoods

Linamar: There is no definitive partnership found with local partners beyond United Way and a strong involvement in their volunteer work.

Martinrea: There is no definitive partnership other than relevant employee groups and local governments.

Magna: Several initiatives taken to develop sustainable livelihood. The company has developed a global supplier code and other guidelines to standardize expected behavior from local partners. Company also supports efforts by employees to develop sustainability in their local communities. There is no clear statement or report of outcomes of this effort.

Scoring:

Sustainable Livelihoods		
Linamar	Magna	Martinrea
15		

The Triple Bottom Line

Linamar: No explicit mention of Triple Bottom Line concepts in the annual report.

Martinrea: No explicit mention of Triple Bottom Line concepts in the annual report.

Magna: No explicit mention of Triple Bottom Line concepts in the annual report.

The Natural Step

Linamar: No application of this framework in any documentation or press releases.

Martinrea: No application of this framework in any documentation or press releases.

Magna: No application of this framework in any documentation or press releases.

Environmental Management Systems

Linamar: The company has developed a requirement for suppliers to develop ISO standards related to the environment and labor conditions.

Martinrea: The company has and is in the process of completing ISO 14001 or equivalent certifications for the manufacturing facilities.

Magna: The company requires facilities and suppliers to be ISO 14001 or equivalent certified.

Scoring:

Environmental Management Systems		
Linamar	Magna	Martinrea
11	11	11

Environmental & Social Accounting

Linamar: While there are efforts towards developing a sustainable value chain, it is not clear as to how the company value impact of use of natural resources. The company is developing renewable energy sources to reduce use of fossil fuels. No actual measure as required to have fulfilled environmental & social accounting can be found.

Martinrea: The company has an uneven reporting of material impact. And the actual monetary reporting of the impact is also uneven. There is involvement in associations focused on proper sourcing of materials.

Magna: While there is considerable information about sourcing of materials and labor, there is no explicit statement of the value of sourcing and extraction operations.

Life Cycle Assessment

Linamar: There is no information on whether company has undertaken life cycle assessment for any aspect of the production process.

Martinrea: The company requires Life Cycle Assessment from suppliers for certain components. Whether the company itself conducts life cycle assessment is not clear.

Magna: The company undertakes Life Cycle Assessment of key products.

Scoring:

Life Cycle Assessment		
Linamar	Magna	Martinrea
	9	

Cleaner Production

Linamar: Company has Toxic Reduction plans as well as plans to develop a significant amount of energy sources from solar. Company also has plans for developing key components in a sustainable manner for electric vehicles.

Martinrea: Company has plans to reduce toxic emissions. Company is gearing to produce components for electric vehicles.

Magna: Company has plans to reduce use of water and emission of waste.

Scoring:

Cleaner Production		
Linamar	Magna	Martinrea
9	9	9

Design for the Environment

Linamar: The company has adapted a philosophy labeled as “Stepping Stool” focused on a future sustainable form of the company. The company’s commitment is officially called “The Linamar Green Commitment”.

Martinrea: The company has adopted an underlying focus on sustainability in developing future business plans. This is expressed in their “Sustainability” section of their website.

Magna: The company has assigned oversight of sustainability initiatives at all levels including the board.

Scoring:

Design for the Environment		
Linamar	Magna	Martinrea
6	6	6

Eco-efficiency

Linamar: While the company has outlined many initiatives, it is not clear how much the initiatives will fulfill the requirements of eco-efficiency. For example, the company mentions that 100% of coolant used gets recycled. However, it is not clear whether the company has integrated environmental efficiency to reduce the amount of coolant used in general.

Martinrea: The company has developed plans for products at which they have a competitive edge and are part of a focus towards developing efficiencies in materials and energy impact.

Magna: The company has developed plans for eco efficiency in the production as well as the end products to customers.

Scoring:

Eco-efficiency		
Linamar	Magna	Martinrea
	9	9

Industrial Ecology

Linamar: The company intends to develop better versions of their product – transmission units – and develop better production processes to develop the components.

Martinrea: While the company has a lot of product related information and supplier management information, it is not clear how the company intends to evolve their manufacturing process in the future to integrate sustainability. More information required.

Magna: The company has specific metrics on how the company deals with production and operational issues related to emissions.

Scoring:

Industrial Ecology		
Linamar	Magna	Martinrea
9	9	

Factor X

Linamar: No information on whether the company has adopted Factor X standards. Other standards followed.

Martinrea: No information on the company following this specific standard.

Magna: No information on the company following this specific standard.

Green Chemistry

Linamar: Company has specific and comprehensive plans to reduce the content of specific product related material requirements. These are more physical rather than chemical treatments.

Martinrea: Company has specific and comprehensive plans to reduce material waste. Again, the focus is on the physical treatment and no chemical treatment information is found.

Magna: As with the other two companies, waste treatment and other pollution concerns are based on physical treatment rather than using chemical processes.

Eco-labelling

Linamar: Company does not have a partnership with any external parties to certify their products.

Martinrea: Company does not have a partnership with any external parties to certify products.

Magna: The company requires suppliers to undertake environmental certifications but no partnership with any standardized eco-labeling partner found.

Corporate Social Responsibility

Linamar: Company has multiple initiatives – partnership with United Way, scholarships at local universities, summer camps – to develop CSR activities.

Martinrea: Company sponsors multiple events for a positive connection with local communities – summer camps, bike rides.

Magna: Company has developed comprehensive plans with local communities at all international locations to develop a strong connection.

Scoring:

Corporate Social Responsibility		
Linamar	Magna	Martinrea
10	10	10

Sustainability Reporting

Linamar: After evaluation, the company has decided to move towards SASB reporting which as stated in the methodology is considered complimenting GRI standards. This started only from 2019. This is yet to be implemented and thus not included in the scoring of sustainability disclosures.

Martinrea: The company does not follow any specific standard as set out by GRI or SASB, for example.

Magna: The company started SASB and some additional information showing adherence to GRI standards reporting only from 2019. Data warnings provided.

Sustainability Reporting		
Linamar	Magna	Martinrea
9	9	

Corporate Citizenship

Linamar: Linamar has not had an issue or controversy that could have affected business operations over 2017 to 2019.

Martinrea: Martinrea has not had an issue or controversy that has affected business operations in 2017-2019.

Magna: According to Sustainalytics, Inc March 2020 data on Yahoo Finance® company profile, the company has remained generally free of any controversy.

Corporate Citizenship		
Linamar	Magna	Martinrea
6	6	6

Summary of Qualitative study using Lozano's CIVIS framework

Corporate Initiative	Linamar	Magna	Martinrea
Sustainable Livelihoods		■	
The Triple Bottom Line			
The Natural Step			
Environmental Management Systems	■	■	■
Environmental & Social Accounting			
Life Cycle Assessment		■	
Cleaner Production	■	■	■
Design for the Environment	■	■	■
Eco-efficiency		■	■
Industrial Ecology	■	■	
Factor X			
Green Chemistry			
Eco-labelling			
Corporate Social Responsibility	■	■	■
Sustainability Reporting*		■	
Corporate Citizenship	■	■	■

Figure 5-9 Summary of Qualitative study using Lozano's CIVIS framework

*Linamar has decided to undertake reporting but not yet implemented it.

Chapter 6 Discussion

In this section a connection will be developed between the key financial metrics analyzed, the literature review and the Canadian companies' disclosure examined in depth – Linamar Corporation, Magna International and Martinrea International. This should lead to understanding how Canadian companies could develop sustainability reporting without the pitfalls of information gaps between what is disclosed and what is the actual impact.

6.1 Impact of identified sector structure

In the beginning of the analysis, it was found that among the top 100 firms around the world, there was a prominent number of firms which were privately held either as family owned businesses or as part of larger conglomerates. Ian Mitroff's work in developing the sphere of influence under which organizational decision makers develop key strategies and objectives become less valid (Mitroff, 1983). Freeman extended the definition of stakeholder beyond the usual three components – customer, supplier, and owner (Freeman, 1984). The reporting of privately held companies is to the board of directors who are usually not obligated to release public information (Cormier & Gordon, 2001; Hope, Thomas, & Vyas, 2013; Zhao, Dong, & Cheng, 2018). This means that the opportunity for activists to put pressure on the companies is considerably less due to lack of verifiable information. Thus, the role of shareholder activism becomes less important and the role of marketing of sustainable business becomes more important.

Galbreth and Ghosh's research on developing customer awareness of what they buy can be drawn on here to understand this point further (Galbreth & Ghosh, 2013). Taken with White et al's research on the

importance of choice, it is best to develop strategies targeted towards the primary buyers of such firms (White et al., 2019). These buyers are the large auto manufacturing companies who have a much shorter value chain when it comes to delivery and use of their product – the finished vehicle. Sen et al provided the development of a key tool in the activist's arsenal – boycotts or withholding of consumption. Large car manufacturers who buy from privately held firms could be forced by their consumers directly to develop a thorough evaluation of their supplier value chain. If the website of the large car manufacturers over the past few years is evaluated, this is indeed the case (Nunes & Bennett, 2010; Singh et al., 2016; Standard & Poors, 2018). With privately held companies a key part of the large auto companies' supply chain this might be the optimum effective strategy to develop pressure on privately held OEM companies.

The second critical point is to remember that geographic, and thus political, boundaries are very relative. While a significant amount of production of OEM parts is carried out by German and Japanese firms, it needs to be made clearer what portion of the production process is carried out in Germany and Japan subject to the respective countries' environmental, social and governance rules and regulations. Francis Bowen's work on Symbolic not Substantive Corporate Environmentalism is important to develop an analysis of when a company is "greenwashing" and when it is taking genuine steps to have a positive impact (Bowen, 2014). Pomering and Johnson suggested that an important way to develop a better perception of stakeholders regarding CSR activities is to ensure that the stated commitment is long term and very specific in terms of the goals to be achieved (Pomering & Johnson, 2009). This is a critically important point to consider when activists look at corporate literature on what the company is developing towards fulfilling its societal responsibilities. This should include a comprehensive map on the geographic location of operations and an evaluation of how it is trying to develop a positive ESG impact at every location.

6.2 Impact of firm size on sustainability disclosure

The result that there is a statistically significant correlation between firm size and the level of sustainability disclosure can be inferred from evaluated research by Fernando-Feijoo et al. They stated that larger firms undertook significant CSR information disclosure (Fernandez-Feijoo, Romero, & Ruiz, 2014a; Fernandez-Feijoo et al., 2014b). This would naturally evolve to the development of sustainability disclosures at a much greater level than smaller firms. However, they also called into question the credibility of such disclosures. As the firms examined financially in depth in the sample were publicly listed, it brings into question whether the sustainability disclosure was to develop an actual scorecard or to develop a better shareholder relationship to prevent negative perceptions of the company. In 2010, Burritt and Schaltegger proposed the integration of projected impact in addition to what it is currently being done to highlight ESG issues. They emphasized the importance of cross-disciplinary work to develop a better scorecard (Burritt & Schaltegger, 2010). This is one of the reasons why the GRI, with all its criticisms, is a better framework to use to develop regular reporting on sustainability than each firm developing its own standards, or even each country.

6.3 Net Income effects on sustainability disclosure

The finding that companies with lower and higher net income margin are likely to undertake lower sustainability disclosure practices follows Gimenez's findings on the importance of getting financial benefits from ESG initiatives. He stated that ESG initiatives undertaken by companies must provide some payback to the companies for management to be enthusiastic and supporting of such initiatives (Gimenez et al., 2012). This is of course if the initiatives and their details outlined are truthful and reflective of the

overall philosophy of the company's business strategy and periodic objectives. This was supported by Hollos who outlined what forces could induce suppliers' development of positive ESG impact initiatives sacrificing profits for the company. They state one important consideration worth remembering especially in this sector – without the cooperation of buyers who sell the finished product to consumers, many suppliers are not keen in developing sustainability (Hollos et al., 2012). Thus, it is important for activist shareholders and other advocacy groups to work through the buyers of the OEM parts to have a greater impact. This point was further bolstered by previous research done by Sahay who stated that without a set agreement and outlining of benefits, it is highly unlikely that supply chain players would undertake environmental and social benefits at the cost of economic gain foregone (Sahay, 2003).

6.4 The cost of developing sustainability disclosure

The finding that undertaking sustainability disclosure did not lead to statistically significant changes in the operating expense margin leads to two critical points to consider. If the work of Bailey et al about the projected integration of information technology in the reporting process is considered, this does not seem surprising. Bailey et al had stated that companies in the auto supply chain would quickly develop significantly efficient information exchange mechanisms to develop competitive advantages for survival and profit (Bailey et al., 2010). They stated that this investment would be made both for the production process and for decision making. It is very likely that companies have developed multi-purpose information exchange mechanisms that can be leveraged to develop a system to implement sustainability disclosure. It is also worth remembering that as the auto parts sector becomes more and more consolidated, it is highly likely that massive economies of scale have enabled companies to reduce costs in general. Gimpel and Graf-drasch theorized that the cost-benefit of companies developing sustainability

should benefit the companies at the point of being able to leverage the investment in sustainability the most (Gimpel et al., 2019). Considering the power dynamics in the industry, even in the fragmented nature of the 2018 sales in millions, it seems that this is hugely disadvantageous to smaller companies.

When the impact of country of jurisdiction was examined, the same lack of statistical significance was observed in terms of the relationship with operating expense margin. This second conclusion should be taken with a grain of salt because as stated, most companies have operations all over the world and it would be very difficult to trace the portion of the production that takes place in the respective countries of operations. There is one key conclusion that can be drawn here. Under current circumstances and based on the sample, it does not seem that sustainability reporting would put an undue burden on the company's operations. This is particularly true for large companies with facilities and employees that could be geared towards this. Smaller players in the sector should be identified. It is important to look at how requirements for sustainability reporting could affect them.

6.5 Inventory turnover ratio

The two tests show that the companies in the sample seem to have similar inventory turnover ratio irrespective of efforts to develop sustainability. This is an important finding when it comes to understanding the potential decision making for companies in terms of substantive operational benefits to developing sustainability. Following Gimpel and Graf-Drasch, a firm will only develop a strategy – altruistic or not – when it benefits them and gives them competitive advantages. This means that unless firms can develop a financial pay-off because of developing and reporting sustainability, the likelihood of sustaining sustainability initiatives related to material sourcing remain low (Gimpel et al., 2019). Looking at the overall median inventory turnover ratio, it seems that this chosen sample already has a high

inventory turnover ratio with some variations among companies. One explanation could be that the specialized nature of the products might necessitate a cycle of production only when required. Thus, this sector has a need for high materials efficiency irrespective of sustainability concerns.

6.6 Investments within and into the company – analysis from Cashflow due to Investments, Net Property Plant and Equipment (NPPE), and Return on Equity (ROE)

This last analysis of the financial metrics of the sample deals with capital allocation and long-term cost of equity. The statistical analysis shows that companies undertaking higher levels of sustainability measurement and disclosure do not necessarily undertake a higher level of investment in equipment and other investments than firms who do not. An understanding of this phenomenon can be drawn from understanding the motivations behind investment decisions made in the context of this industry.

For the auto manufacturing companies, it took until 2012 to recover from the effects of the 2008 financial crisis that affected demand for their key product lines across the world (Pavlínek, 2015; Sweeney & Mordue, 2017). This in turn had a serious effect on the financial health and growth of the auto parts supply chain. This would naturally make them very cautious when developing long-term plans for expansion and consolidation of businesses. It was interesting in the results of the analysis on the level of investment and change in Net Property Plant and Equipment (NPPE) how much seemingly independent the two aspects were of the sustainability disclosure or standardized reporting levels.

As outlined in the literature review, Tate et al developed an understanding of the importance of developing sustainability regulations when undertaking purchasing decisions. This was critical in developing a reward mechanism for sustainability in the B2B market (Tate et al., 2012). This is especially

important in the auto sector where costs pressures faced by the large auto manufacturing firms tend to be transferred down the value chain (Holmes et al., 2017). What the analysis of the investments undertaken and the change in NPPE shows is that it is highly unlikely components manufacturers in this sector will undertake a purely altruistic decision for strengthening the level of sustainability of various value chain activities. Thus, there is the scope for the Provincial and Federal governments in the financing of sustainability by pooling the most at risk activities and developing common solutions for the long term benefit without compromising the financial health of this critical sector to Canada.

The companies could raise capital from the financial markets, but the Return on Equity (ROE) analysis shows that the companies are already barely matching the S&P 500 ETF return. This is the "safest" considered index to compare with. Regular investors would probably not be willing to invest in scenarios where the company is undertaking long-term returns sacrificing short term immediate gains (Schoenmaker & Schramade, 2019). The number of investors interested in investing in the development of sustainability is still fewer than ideal as stated by Schoenmaker. However, they state that this number is growing and includes many large funds. This could be an avenue to research on the appetite for green bonds to finance the development of sustainable value chain components. With many private equity funds setting up sustainable investment funds, strengthening sustainable value chains could be an option in their respective portfolios.

6.7 A qualitative analysis of the sustainability initiatives and disclosure of Linamar Corporation, Magna International and Martinrea International

The key reason behind the selection of Lozano's model is to show how the initiatives outlined by the companies encompass both the business and the sustainability perspective. Another key takeaway from

this model is the longevity of the sustainability initiatives disclosed by the company (Lozano, 2008, 2012) Following the categorization of the various initiatives by the three Canadian companies in the sample, some key conclusions can be made.

Magna International is the only company that has clearly stated initiatives related to the development of sustainable livelihoods across the various points of production across the world. While all three companies have options for employees to contribute to the company's impact on ESG issues, Magna International has a mechanism that integrates the initiatives as part of the strategic decision making. This is feasible because of the sheer size of the company. Linamar and Martinrea being much smaller companies cannot afford spending on initiatives without very careful consideration on the financial impact.

One common initiative followed by all three companies is the adaptation, both internally and with suppliers, of ISO mechanisms related to environment. Galbreth and Ghosh developed a proof that consumer awareness of sustainability differences can impact sales (Galbreth & Ghosh, 2013). In the B2B markets, with no pull forces from consumers, ISO certifications and other widely accepted standards could help companies retain a competitive edge or even the playing field when appealing to the buying firm. This is interesting because of the three, two have only just started developing standard annual reporting based on SASB. This means that it is important for the respective standards boards of GRI, and by extension SASB, to develop market awareness so that more B2B companies can be interested in developing GRI standard sustainability reporting with modifications proposed by SASB.

The resource constraints inferred by the three companies are also apparent in the production related initiatives. All three companies claim to undertake cleaner production initiatives. Due to regulatory requirements, the companies have toxicity reduction plans. The actual application of "Design for the Environment" initiatives are not clear. While the companies can be involved in forward thinking regarding reducing ESG impact (Linamar: "Stepping stool"; Magna & Martinrea: board involvement), the actual

impact is not clear until more reports are published. One key commitment to sustainability in the production process is developing Life Cycle Assessment (LCA) for products and processes. Of the three, only Magna seems to regularly undertake LCA studies for various components produced. Mariadoss et al's study of innovation-based sustainability strategies for B2B companies is very illuminating here. For all three companies, the development of technical (waste management, less materials use) is important, but so is the promotion of doing something positive about ESG impact (Mariadoss et al., 2011). This means that companies will state more but could deliver less. Magna International with its commitment to Life Cycle Assessment seems to have a more substantive commitment. However, we should note that this could have an adverse effect on their supply chain partners.

Other categories of initiatives like CSR and Corporate Citizenship are common to all the companies. Several literatures reviewed consider these as "matter of fact" rather than something new 8 years after Lozano's CIVIS model was first published. Lozano's model recommends selecting the specific initiatives that allow for the highest coverage of both benefits to the company and to develop sustainability in the long run. He clearly states that more initiatives do not mean actual impact. Thus, he recommends companies develop the most effective combination. Thus, looking at the summary of the classifications of the three companies, it seems that the initiatives could be made more efficient and thus have a greater impact at lower financial cost, especially for firms like Linamar and Martinrea.

Chapter 7 Conclusions, contributions, and directions for further research

While it is important to stress that the companies in the sample are not representative of the entire auto supply chain sector, the findings and subsequent relation to various literature on corporate sustainability can help develop some definitive conclusions.

Looking at target 6 under SDG 12, some key areas of concern have been identified. This study confirms and develops points related to the research that highlights the importance of firm size, internal priorities, and impactful reporting. Larger firms are at a significant advantage when it comes to developing sustainability initiatives and reporting as compared to their smaller counterparts in the sector. It is important to ensure that smaller privately owned firms, a key feature of the Canadian OEM parts manufacturing landscape, can integrate sustainability reporting into their day to day activities without undue burden. Institutional theory explaining the development of sustainability reporting can be expanded to include the importance of allocating resources during operations that contribute to a discernable benefit to key personnel and decision makers in an organization. Institutional theory needs to prioritize mechanisms for development of internal adaptation to respond to the changes needed at minimal cost to the organization in developing sustainability. Sustainability must be a part of the normal business operations for strategic and tactical reasons rather than something that a company needs to put extra resources into. The examination of development of organizational flexibility and responsiveness to sustainability initiatives' results is key to developing the application of institutional theory in such financially tight sectors dependent on a few key buyers.

The next key conclusion that can be developed is the importance of resources and rewards. This draws on and expands on the importance of stakeholder theory in developing sustainability. The auto sector is undergoing big changes. For example, in a lot of the materials presented on the websites and in their

regulatory filings such as annual reports, the companies emphasize adaptation of electric vehicle focused key components to be produced for the big auto manufacturing companies. Public transportation is not feasible at every location of human inhabitation. Thus, a hybrid approach to transportation is important. This means that new technologies and production methods are being introduced both in the final product and in the production process. If the companies were to adapt sustainability initiatives and monitoring at this early phase, it could help companies undertake a seamless transition to a sustainable economy. Stakeholder theory is important in developing an understanding of the reasons and motivations behind such early adaptation of sustainability. One key aspect that the study looked at was the reward and tradeoff as it related to financial resource allocation and return.

Companies need to identify how to finance both themselves and their own suppliers of various sub-components and minerals which would not put undue pressure leading adverse ESG impact as seen in many industries currently. Stakeholder theory will integrate the risk reward mechanisms of traditional financing with the development of acceptance of reward for a sustainable future. This can be connected to understanding how to achieve target 4 of SDG 9: adaptation of clean and environmentally sound technologies and target 3 of SDG 9: developing the access that companies have to financial resources that allow the development of such technologies. SDG 9 depends on the involvement of more players – government, regulatory and functional – to help companies working towards retooling for a more sustainable personal transportation infrastructure. Part of the approach will require the development of green financing dedicated to the retooling of the auto component sector and the development of a feasible mechanism for monitoring and treatment of ESG concerns. The question becomes why entities such as holding companies and banks be interested in such investments where financial return is not optimized.

Stakeholder theory can be developed by understanding the growing importance of positive and negative impact on ESG by financing entities which range from large institutional investors to retail investors who

want to use their investments as part of their contribution to a sustainable future. Stakeholder theory can now be expanded to look at this phenomenon from the perspective of communication of information that highlights how money is being used by the company to develop sustainable value chain processes. This draws on reporting – target 6 of SDG 12 – as well. This enshrines the relevance of integrating the two theories – stakeholder and institutional - to develop a feasible and long-lasting adaptation of information generation and monitoring of sustainability initiatives.

Employees within an organization must now become part of a mechanism to develop the information that is quantifiable and comparable over specific time periods. Standardization of this information is also important. Taken together, this means the involvement of government and regulatory entities to develop a standardized and effective framework. This sector also has highlighted another key point to consider going forward. Many companies in key sectors are going private. It is important that the sustainability reporting framework be implemented across the board for both private and publicly owned entities. It is important for public companies to be able to confidently invest in developing sustainability without fear that privately held companies will undercut them in terms of costs of product and financing.

In summary, higher management involvement, financial support, pooling of resources and training of employees could enable a lot of the auto component manufacturers to be in a better position to attain specific targets under the SDGs and undertake regular monitoring of such without causing adverse impact on their economic welfare. Whether in Canada or elsewhere, it is important to find a balance to attain the positive ESG aims along with a reasonable annual profit. Otherwise, the impact of sustainability initiatives could be transient in nature.

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Appendix I

Automotive News Top 100 OEM parts Global suppliers Listings (2018) and summary of sales data

URL for list: https://www.nxtbook.com/nxtbooks/crain/an9381127498RISGS_supp

2018 Rank	Name	Country	2018 Sales in mill (U$)
1	Robert Bosch	Germany	$49,525
2	Denso Corp	Japan	$42,793
3	Magna International Inc.	Canada	$40,827
4	Continental	Germany	$37,803
5	ZF Friedrichshafen	Germany	$36,929
6	Aisin Seiki Co.	Japan	$34,999
7	Hyundai Mobis	South Korea	$25,624
8	Lear Corp	USA	$21,149
9	Faurecia	France	$20,667
10	Valeo	France	$19,683
11	Yazaki Corp	Japan	$17,500
12	Panasonic Automotive Systems Co	Japan	$17,466
13	Adient	USA	$17,400
14	Sumitomo Electric Industries	Japan	$15,402
15	Yanfeng	China	$14,506
16	Thyssenkrupp	Germany	$14,438
17	Mahle	Germany	$14,405
18	JTEKT Corp.	Japan	$13,078
19	BASF	Germany	$12,931
20	Aptiv	Ireland	$12,869
21	Samvardhana Motherson Group	India	$11,765
22	BorgWarner Inc	USA	$10,530
23	Toyota Boshoku Corp	Japan	$10,153
24	Gestamp	Spain	$10,096
25	Schaeffler	Germany	$10,052
26	Tenneco Inc	USA	$10,001
27	Plastic Omnium Co	France	$9,740
28	Magneti Marelli	Italy	$8,702
29	Autoliv Inc	Sweden	$8,678
30	Hitachi Automotive Systems	Japan	$8,638
31	Flex-N-Gate Corp	USA	$8,343
32	Calsonic Kansei Corp	Japan	$8,208
33	Dana Inc	USA	$8,143
34	Benteler Automotive	Germany	$8,060
35	Koito Manufacturing	Japan	$7,990
36	Hyundai-WIA Corp	South Korea	$7,758
37	Toyoda Gosei Co	Japan	$7,642
38	Hyundai-Transys Inc	South Korea	$7,574

2018 Rank	Name	Country	2018 Sales in mill (U$)
39	Brose Fahrzeugteile	Germany	$7,340
40	American Axle & Mfg. Holdings Inc	USA	$7,270
41	JATCO	Japan	$6,812
42	HELLA	Germany	$6,801
43	GKN Automotive	UK	$6,450
44	Grupo Antolin	Spain	$6,408
45	Eberspaecher Gruppe	Germany	$5,445
46	Hanon Systems	South Korea	$5,396
47	Mando Corp	South Korea	$5,219
48	Draexlmaier Group	Germany	$5,060
49	NSK	Japan	$5,010
50	Freudenberg Group	Germany	$4,906
51	NTN Corp	Japan	$4,725
52	Nemak	Mexico	$4,704
53	TS Tech Co	Japan	$4,440
54	Infineon Technologies	Germany	$4,210
55	Tokai Rika Co	Japan	$4,187
56	IAC Group	Luxembourg	$4,122
57	Linamar Corp	Canada	$4,068
58	Webasto	Germany	$4,049
59	TI Fluid Systems	UK	$3,983
60	Nexteer Automotive	USA	$3,912
61	BHAP	China	$3,869
62	Delphi Technologies	UK	$3,863
63	Federal-Mogul	USA	$3,786
64	Cooper-Standard Automotive	USA	$3,629
65	CITIC Dicastal Co	China	$3,580
66	CIE Automotive	Spain	$3,578
67	NHK Spring Co	Japan	$3,431
68	Garrett Motion Inc	Switzerland	$3,375
69	DuPont, Transporation & Industry	USA	$3,200
70	Mitsuba Corp	Japan	$3,162
71	Flex	USA	$3,000
72	Visteon Corp	USA	$2,984
73	Novelis Inc	USA	$2,947

74	Leopold Kostal	Germany	$2,884
75	Asahi Glass Co	Japan	$2,883
76	Piston Group	USA	$2,844

2018 Rank	Name	Country	2018 Sales in mill (U$)
77	Inteva Products	USA	$2,800
78	Martinrea International Inc	Canada	$2,724
79	Sumitomo Riko Co	Japan	$2,566
80	Johnson Electric Group	Hong Kong	$2,541
81	Kautex Textron	Germany	$2,285
82	Autoneum	Switzerland	$2,236
83	F-Tech Inc	Japan	$2,119
84	Arconic Inc	USA	$2,100
85	Bridgewater Interiors	USA	$1,969
86	Minth Group	China	$1,902
87	SEG Automotive	Germany	$1,867
88	Ryobi	Japan	$1,848
89	Wuling Industry	China	$1,812
90	Gentex Corp	USA	$1,791
91	Hyundai Kefico Corp	South Korea	$1,754
92	Anhui Zhongding Sealing Parts Co	China	$1,714
93	Multimatic Inc	Canada	$1,650
94	Constellium	Netherlands	$1,595
95	Tower International	USA	$1,571
96	Preh	Germany	$1,556
97	Dura Automotive Systems	USA	$1,400
98	Omron Corp	Japan	$1,359
99	Auria	USA	$1,100
100	Henniges Automotive	USA	$994

Appendix II

Outline of disclosure scores for Companies in selected sample

Company with Stock Code	Full Score
AAPICO Hitech Public Company Limited (AH-R.BK)	3
AGC Inc. (ASGLY)	5
Aisan Industry Co., Ltd. (7283.T)	2
Aisin Seiki Co., Ltd. (7259.T)	5
Akebono Brake Industry Co., Ltd. (7238.T)	2
Alps Alpine Co., Ltd. (APELY)	3
American Axle & Manufacturing Holdings, Inc. (AXL)	3
Aptiv PLC (APTV)	3
Autoliv, Inc. (ALV)	5
Autoneum Holding AG (AUTN.SW)	5
BorgWarner Inc. (BWA)	3
Changchun FAWAY Automobile Components Co.,Ltd (600742.SS)	0
Changzhou Xingyu Automotive Lighting Systems Co.,Ltd. (601799.SS)	0
CIE Automotive, S.A. (CIE.MC)	2
Compagnie Plastic Omnium SA (POM.PA)	3
Constellium SE (CSTM)	5
Continental Aktiengesellschaft (CTTAY)	5
Cooper-Standard Holdings Inc. (CPS)	5
Dana Incorporated (DAN)	3
DENSO Corporation (DNZOY)	3
F-Tech Inc. (7212.T)	2
Faurecia S.E. (EO.PA)	3
Federal-Mogul Izmit Piston Ve Pim Uretim Tesisleri A.S. (FMIZP.IS)	0
Furukawa Electric Co., Ltd. (5801.T)	5
Gentex Corporation (GNTX)	3
Hanon Systems (018880.KS)	2
HELLA GmbH & Co. KGaA (HLE.DE)	2
HUAYU Automotive Systems Company Limited (600741.SS)	2
Hyundai Mobis Co.,Ltd (012330.KS)	5
HYUNDAI WIA Corporation (011210.KS)	2
Infineon Technologies AG (IFX.DE)	5
Johnson Electric Holdings Limited (0179.HK)	2
JTEKT Corporation (6473.T)	3
JTEKT India Limited (JTEKTINDIA.NS)	1
Koito Manufacturing Co., Ltd. (7276.T)	3
Lear Corporation (LEA)	3
Linamar Corporation (LNR.TO)	3
Magna International Inc. (MGA)	3
MAHLE Metal Leve S.A. (LEVE3.SA)	3
Martinrea International Inc. (MRE.TO)	2

Company with Stock Code	Full Score
Minth Group Limited (0425.HK)	2
Mitsuba Corporation (7280.T)	2
NHK Spring Co., Ltd. (5991.T)	2
Nidec Corporation (NJDCY)	5
Ningbo Joyson Electronic Corp. (600699.SS)	1
Nissin Kogyo Co., Ltd. (7230.T)	2
NSK Ltd. (NPSKF)	5
NTN Corporation (6472.T)	3
OMRON Corporation (OMRNY)	5
Rane (Madras) Limited (RML.NS)	2
Ryobi Limited (5851.T)	2
Schaeffler AG (SHA.DE)	5
Sumitomo Electric Industries, Ltd. (SMTOY)	5
Sumitomo Riko Company Limited (5191.T)	3
Taiwan Calsonic Co., Ltd. (4523.TWO)	1
TE Connectivity Ltd. (TEL)	3
Tenneco Inc. (TEN)	2
Tokai Rika Co., Ltd. (6995.T)	5
Toyo Tire Corporation (5105.T)	3
Toyoda Gosei Co., Ltd. (7282.T)	5
Toyota Boshoku Corporation (3116.T)	3
TS TECH Co., Ltd. (7313.T)	2
Valeo SA (VLEEY)	5
Visteon Corporation (VC)	3
Wanxiang Qianchao Co.,Ltd. (000559.SZ)	2
Weichai Power Co., Ltd. (WEICY)	5
Weifu High-Technology Group Co., Ltd. (200581.SZ)	2

Company with Stock Code	ESG related Risks	CSR	GRI / GC Standards
AAPICO Hitech Public Company Limited (AH-R.BK)	2	2	1
Alps Alpine Co., Ltd. (APELY)	2	1	1
American Axle & Manufacturing Holdings, Inc. (AXL)	1	2	0
Aptiv PLC (APTV)	1	2	0
BorgWarner Inc. (BWA)	1	1	0
Compagnie Plastic Omnium SA (POM.PA)	1	2	1
Dana Incorporated (DAN)	1	2	1
DENSO Corporation (DNZOY)	2	2	1
Faurecia S.E. (EO.PA)	1	1	1
Gentex Corporation (GNTX)	2	2	1
JTEKT Corporation (6473.T)	2	2	1
Koito Manufacturing Co., Ltd. (7276.T)	1	1	0
Lear Corporation (LEA)	1	2	1
Linamar Corporation (LNR.TO)	1	1	0
Magna International Inc. (MGA)	1	2	1
MAHLE Metal Leve S.A. (LEVE3.SA)	1	2	0
NTN Corporation (6472.T)	1	1	1
Sumitomo Riko Company Limited (5191.T)	1	2	1
TE Connectivity Ltd. (TEL)	1	1	1
Toyo Tire Corporation (5105.T)	1	2	0
Toyota Boshoku Corporation (3116.T)	2	2	1
Visteon Corporation (VC)	1	2	0
Autoliv, Inc. (ALV)	2	2	2
Schaeffler AG (SHA.DE)	2	2	2
AGC Inc. (ASGLY)	2	2	2
Aisin Seiki Co., Ltd. (7259.T)	2	2	1
Autoneum Holding AG (AUTN.SW)	2	2	2
Constellium SE (CSTM)	2	2	2
Continental Aktiengesellschaft (CTTAY)	2	2	2
Cooper-Standard Holdings Inc. (CPS)	2	2	2
Furukawa Electric Co., Ltd. (5801.T)	2	2	1
Hyundai Mobis Co.,Ltd (012330.KS)	2	2	2
Infineon Technologies AG (IFX.DE)	2	2	2
Nidec Corporation (NJDCY)	2	2	1
NSK Ltd. (NPSKF)	2	2	2
OMRON Corporation (OMRNY)	2	2	2
Sumitomo Electric Industries, Ltd. (SMTOY)	2	2	2
Tokai Rika Co., Ltd. (6995.T)	2	2	1
Toyoda Gosei Co., Ltd. (7282.T)	2	2	2
Valeo SA (VLEEY)	1	2	2

Weichai Power Co., Ltd. (WEICY)	2	2	1

Appendix III

Data from MS Excel® for the hypotheses tested

Data and output related to hypothesis examining effect of firm size

# of employees	Full Score	# of employees	Full Score
4,020	3	24,608	3
55,598	5	164,100	3
10,716	2	27,000	3
114,478	5	159,000	3
8,678	2	6,930	3
42,289	3	17,000	2
20,000	3	17,740	2
141,000	3	28,433	2
60,260	5	18,196	2
13,128	5	108,906	5
29,000	3	57,415	1
13,687	0	10,325	2
7,144	0	31,484	5
28,136	2	24,687	3
21,913	3	28,006	5
11,700	5	1,128	2
239,649	5	7,819	2
28,000	5	86,548	5
31,700	3	272,796	5
171,992	3	26,156	3
7,564	2	305	1
115,496	3	80,000	3
62	0	78,000	2
52,215	5	19,390	5
5,874	3	11,840	3
1,836	2	39,429	5
36,932	2	43,103	3
33,390	2	16,183	2
6,853	5	114,700	5
2,314	2	11,000	3
40,813	5	8,274	2
35,000	2	80,182	5
10,563	3	5,441	2
1,636	1		

Net income margin

Stock Code	Disc Score	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019
AH-R.BK	3	0.021539912	0.036867438	0.073379557	0.077617336	-0.009848673
ASGLY	5	0.032350318	0.036986675	0.047299957	0.058830366	0.029270658
7283.T	2	0.031761929	0.028826152	0.022108368	0.021296418	0.028684647
7259.T	5	0.02608595	0.029900918	0.035550502	0.034421378	0.027237201
7238.T	2	-0.02398124	-0.06917584	0.001330332	0.002951823	-0.074954446
APELY	3	0.046404422	0.050429049	0.046358372	0.055212701	0.025975765
AXL	3	0.060362276	0.060967579	0.053798276	-0.007908781	-0.074185794
APTV	3	0.095614903	0.075445652	0.105169202	0.073917561	0.06895591
ALV	5	0.049816786	0.056295664	0.041136132	0.021940034	0.053991764
AUTN.SW	5	0.020231075	0.04450432	0.041443486	0.024150778	-0.042134587
BWA	3	0.075992123	0.013063609	0.044890962	0.088388923	0.073367427
600742.SS	0	0.043095758	0.035628057	0.036732843	0.036354261	0.030151571
601799.SS	0	0.118939191	0.104545958	0.110441785	0.120324893	0.129668092
CIE.MC	2	0.049045419	0.056390285	0.057836066	0.130963741	0.083060006
POM.PA	3	0.051572738	0.053286431	0.062817233	0.073612532	0.030399185
CSTM	5	-0.107510188	-0.000843348	-0.00591942	0.033063665	0.00998815
CTTAY	5	0.06951978	0.069113059	0.067817176	0.065248038	-0.027541458
CPS	5	0.033468908	0.040020836	0.037395878	0.029693387	0.021724682
DAN	3	0.026237624	0.109852386	0.01539742	0.052437677	0.026218097
DNZOY	3	0.059952383	0.053983824	0.056905363	0.062753081	0.047461276
7212.T	2	0.010092323	0.013771818	0.020384862	0.020830753	0.012083565
EO.PA	3	0.019807782	0.034087812	0.030235312	0.039989272	0.033188132
FMIZP.IS	0	0.270169308	0.274525775	0.286463532	0.336330489	0.274672585
5801.T	5	0.008475289	0.011438153	0.020833729	0.029511037	0.029354874
GNTX	3	0.206313945	0.207032075	0.226641115	0.238750212	0.228460128
018880.KS	2	0.041472825	0.051216624	0.051661298	0.046759617	0.044524783
HLE.DE	2	0.049187695	0.04227089	0.051897658	0.055051016	0.090128285
600741.SS	2	0.052495298	0.048881442	0.046651372	0.051073137	0.044875716
012330.KS	5	0.084826077	0.079394837	0.044620024	0.053736727	0.060203526
011210.KS	2	0.041459412	0.017224813	-0.00841463	-0.007050489	0.007547481
IFX.DE	5	0.109059534	0.114938977	0.111850488	0.141465982	0.108357205
0179.HK	2	0.098730743	0.077220146	0.085702934	0.081582606	0.085761075
6473.T	3	0.031357117	0.034766037	0.036047667	0.034483787	0.016216131
JTEKTINDIA.NS	1	0.024403631	0.024399585	0.023045971	0.037499176	0.041697523

7276.T	3	0.051042507	0.056919864	0.067373695	0.098244957	0.088223156
LEA	3	0.040935897	0.05254451	0.064171593	0.054367922	0.038040817
LNR.TO	3	0.084586001	0.086940254	0.083918663	0.07761625	0.058037323
MGA	3	0.062643929	0.055727809	0.056642531	0.056237294	0.044761736
LEVE3.SA	3	0.082621174	0.011026799	0.10479619	0.112544344	0.102536657
MRE.TO	2	0.027679426	0.023278862	0.043230739	0.050747495	0.046903984
0425.HK	2	0.166142744	0.182887496	0.177895814	0.132287842	0.128070601
7280.T	2	0.03736235	0.025561771	0.015494989	-0.016860114	-0.021066497
5991.T	2	0.039693466	0.033710321	0.0400319	0.031065739	0.010431626
NJDCY	5	0.074112322	0.077918	0.093154319	0.088323959	0.072974077
600699.SS	1	0.049471846	0.024454712	0.014879208	0.023459736	0.015236198
7230.T	2	0.045848768	0.200669016	0.032266956	-0.046312579	0.038715187
NPSKF	5	0.063558266	0.067382057	0.047999831	0.067930431	0.056295108
6472.T	3	0.033269697	0.020972223	0.004141496	0.02736938	-0.009485134
OMRNY	5	0.073378405	0.056729574	0.057903478	0.073442235	0.063204349
RML.NS	2	0.015971652	0.014237235	0.004102293	0.017327724	0.00155665
5851.T	2	0.016767695	0.036560737	0.03471073	0.031732419	0.022279259
SHA.DE	5	0.044684712	0.064402459	0.069895157	0.061863633	0.029666597
SMTOY	5	0.042429692	0.031025652	0.038217321	0.039039052	0.03715027
5191.T	3	-0.011046816	0.006834164	0.012292076	0.007621764	-0.010691817
4523.TWO	1	-0.000865906	0.000231485	-0.079763182	-0.15849388	-0.181443799
TEL	3	0.197825554	0.164160811	0.128345916	0.183371461	0.137120761
TEN	2	0.030088927	0.042214211	0.022320466	0.004675678	-0.019140401
6995.T	5	0.043631619	0.011740816	-0.009445183	0.045677411	0.035635139
5105.T	3	0.004105064	-0.032124936	0.03821244	0.026837394	0.064860368
7282.T	5	0.029065214	0.025905311	0.021483561	0.026241173	0.026439493
3116.T	3	0.003986206	0.002754681	0.033403465	0.030554543	0.019371712
7313.T	2	0.050677099	0.051289206	0.046083317	0.062806315	0.06248908
VLEEY	5	0.050123762	0.055996126	0.047762803	0.028550512	0.016070237
VC	3	0.70385208	0.023726669	0.055944056	0.054959786	0.0237691
000559.SZ	2	0.07611785	0.077305807	0.079029382	0.063597179	0.050659174
WEICY	5	0.018862975	0.026197643	0.04491898	0.054362388	0.052219022
200581.SZ	2	0.263929347	0.260361563	0.285156882	0.274726759	0.258189238

Operating expense margin

Stock Code	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019
AH-R.BK	0.02249037	0.02525044	0.03025194	0.05191680	0.05931661
ASGLY	0.19961653	0.19840555	0.19476923	0.19745565	0.19905879
7283.T	0.08208731	0.07941586	0.07769582	0.07787356	0.08129971
7259.T	0.08444077	0.08664988	0.08010617	0.07243606	0.07228841
7238.T	0.07991124	0.07189496	0.08395372	0.08076747	0.08962194
APELY	0.13530471	0.12913578	0.14228383	0.13594977	0.13197319
AXL	0.07104609	0.08085106	0.07427386	0.06672260	0.07044971
APTV	0.07319486	0.07676610	0.08297113	0.07945965	0.08511527
ALV	0.12173923	0.12004646	0.12612448	0.11814662	0.10044925
AUTN.SW	0.46828707	0.46032705	0.47512483	0.48840675	0.49390615
BWA	0.08558929	0.08965935	0.09165961	0.08904422	0.08566090
600742.SS	0.04939401	0.04766051	0.04997849	0.05469856	0.05677344
601799.SS	0.12139961	0.10652764	0.10194041	0.09390969	0.08846530
CIE.MC	0.34855141	0.34106970	0.32414247	0.27506928	0.28046328
POM.PA	0.08186299	0.08026086	0.07991414	0.07169981	0.06592779
CSTM	0.05433728	0.06029939	0.05422952	0.05047485	0.05485018
CTTAY	0.14729812	0.15892181	0.15433713	0.16084667	0.15587341
CPS	0.10044890	0.10754815	0.10048075	0.09083009	0.10309548
DAN	0.06633663	0.06968761	0.07143848	0.06078841	0.05858469
DNZOY	0.09889561	0.10199597	0.09433423	0.08633357	0.09597723
7212.T	0.08535189	0.08051216	0.08352489	0.07682916	0.07126074
EO.PA	0.04851788	0.05107827	0.04690388	0.05779842	0.07062538
FMIZP.IS	0.02590094	0.03538157	0.04592334	0.00646171	0.01129426
5801.T	0.12544811	0.13009570	0.13702593	0.12520611	0.12733589
GNTX	0.09394140	0.09333909	0.09536605	0.09941920	0.10746713
018880.KS	0.09023422	0.08351057	0.08553931	0.08066384	0.07694578
HLE.DE	0.20426480	0.21026989	0.20715857	0.20577431	0.19057577
600741.SS	0.09321447	0.09857811	0.09865282	0.09905388	0.10600134
012330.KS	0.06144571	0.06249150	0.06943571	0.07231848	0.07542412
011210.KS	0.04314533	0.04137087	0.03703890	0.03769397	0.04028586
IFX.DE	0.25849871	0.24208250	0.23191278	0.18634031	0.22829742
0179.HK	0.19240917	0.19562154	0.17756703	0.14850366	0.14914609
6473.T	0.09574172	0.10030236	0.10489718	0.11249402	0.11697470
JTEKTINDIA.NS	0.26241244	0.25601801	0.25687660	0.28047323	0.24004862
7276.T	0.06490580	0.06724837	0.06517631	0.06222169	0.05565218
LEA	0.03475845	0.03636785	0.03336102	0.03140648	0.03368450
LNR.TO	0.05158152	0.05412363	0.05352375	0.05771567	0.05578279
MGA	0.07001929	0.07290438	0.07294716	0.07206016	0.07714742
LEVE3.SA	0.15968276	0.26023487	0.14986334	0.12437308	0.13322458
MRE.TO	0.05818653	0.05896472	0.06772634	0.07418111	0.07623059

0425.HK	0.13367893	0.14063586	0.14147347	0.15139341	0.15735219
7280.T	0.09603634	0.09182191	0.10000091	0.10370984	0.10146784
5991.T	0.07032193	0.06839173	0.06939150	0.06882209	0.06799059
NJDCY	0.12734530	0.12343396	0.12195752	0.12736259	0.13524027
600699.SS	0.14501650	0.12029396	0.12497072	0.13235917	0.12541076
7230.T	0.05669868	0.07360368	0.06151394	0.06502994	0.05885826
NPSKF	0.13148115	0.13827373	0.15853746	0.13804935	0.14706491
6472.T	0.12516313	0.12911648	0.13461178	0.13588770	0.14114691
OMRNY	0.29036934	0.31012927	0.30752417	0.31602406	0.32282235
RML.NS	0.36855485	0.37374146	0.41072551	0.38233316	0.36314340
5851.T	0.10520199	0.10066088	0.10720077	0.10172255	0.09849038
SHA.DE	0.17548768	0.16036887	0.15840525	0.16361211	0.18562418
SMTOY	0.13381980	0.13379989	0.13494130	0.13031856	0.13164379
5191.T	0.12958372	0.12898218	0.12557083	0.12509803	0.14040515
4523.TWO	0.19806285	0.19396065	0.21968223	0.32953450	0.29292127
TEL	0.17420093	0.17216866	0.17150919	0.16256792	0.15868531
TEN	0.10232671	0.11105943	0.11106319	0.11417155	0.12234957
6995.T	0.08066874	0.08026216	0.07419566	0.07626596	0.08230949
5105.T	0.22099419	0.22784074	0.22635611	0.23340369	0.24472721
7282.T	0.07297560	0.07478712	0.07540355	0.07571214	0.08282733
3116.T	0.06392407	0.06116592	0.06032861	0.05825384	0.06085964
7313.T	0.07934991	0.08325776	0.08469119	0.06843521	0.08553602
VLEEY	0.10402915	0.10575701	0.10884097	0.12920937	0.12424911
VC	0.07550077	0.06959823	0.07056580	0.06467828	0.07504244
000559.SZ	0.11763754	0.12250383	0.11205507	0.11267587	0.11183198
WEICY	0.18453715	0.16899090	0.13535311	0.13619536	0.13608596
200581.SZ	0.17288934	0.16479821	0.12838483	0.14252913	0.13285754

Country Code	Ln of av op exp margin
15	-3.274250323
9	-1.620189771
9	-2.529806304
9	-2.53597774
9	-2.510472288
9	-2.003003189
17	-2.621845008
8	-2.531980634
12	-2.143010242
13	-0.739797858
17	-2.426758424
3	-2.962278097
3	-2.278394733
11	-1.158810715
4	-2.577902356
4	-2.903367457
5	-1.861396208
17	-2.297789867
17	-2.727735243
9	-2.348552386
9	-2.532051464
4	-2.900699112
16	-3.689184988
9	-2.047769635
17	-2.323741574
10	-2.484361883
5	-1.591555419
3	-2.311624574
10	-2.684971979
10	-3.221203882
5	-1.472173245
6	-1.756491767
9	-2.24354296
7	-1.350287345
9	-2.763972052
17	-3.383878438
2	-2.90872057
2	-2.617081048
1	-1.798930753
2	-2.702199462
3	-1.931664686

Country Code	
Brazil	1
Canada	2
China	3
France	4
Germany	5
Hong Kong	6
India	7
Ireland	8
Japan	9
South Korea	10
Spain	11
Sweden	12
Switzerland	13
Taiwan	14
Thailand	15
Turkey	16
US	17

9	-2.316609267
9	-2.673886926
9	-2.063033462
3	-2.043223613
9	-2.762386543
9	-1.947141667
9	-2.016014629
9	-1.173204909
7	-0.968374663
9	-2.276378362
5	-1.779635567
9	-2.018123172
9	-2.040774981
14	-1.399046119
13	-1.78482517
17	-2.187524956
9	-2.541598903
9	-1.466791482
9	-2.57254321
9	-2.798416738
9	-2.522558431
4	-2.167904534
17	-2.643990003
3	-2.159863551
3	-1.882346351
3	-1.908573248

Inventory Turnover

Stock Code	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019
AH-R.BK	12.54	13.68	14.57	13.18	8.50
ASGLY	5.59	5.54	5.99	5.65	5.34
7283.T	9.97	9.55	9.40	9.67	9.53
7259.T	13.38	13.03	13.46	13.65	12.69
7238.T	13.91	14.68	13.59	13.30	13.70
APELY	9.45	8.95	8.50	9.24	8.87
AXL	16.29	17.55	20.49	17.07	15.67
APTV	13.27	13.81	11.13	12.23	11.20
ALV	13.22	13.57	12.72	10.73	11.41
AUTN.SW	15.96	15.43	12.17	10.24	10.80
BWA	13.05	13.29	13.92	13.61	12.81
600742.SS	10.96	11.70	12.18	15.54	20.62
601799.SS	4.15	4.15	4.30	4.27	4.32
CIE.MC	9.50	9.26	9.56	7.26	8.61
POM.PA	15.16	15.88	16.83	12.59	11.53
CSTM	10.58	8.37	8.49	8.73	8.88
CTTAY	12.36	11.40	11.17	10.27	9.65
CPS	21.15	23.46	22.85	20.99	19.49
DAN	9.48	9.23	8.97	8.14	7.75
DNZOY	9.56	9.46	9.41	9.86	9.22
7212.T	11.21	11.46	11.17	11.86	12.66
EO.PA	17.21	15.79	15.04	12.29	11.91
FMIZP.IS	20.09	24.90	23.03	20.68	21.49
5801.T	8.99	9.08	8.54	8.87	8.38
GNTX	9.76	9.22	8.84	8.30	7.84
018880.KS	14.74	14.05	12.44	12.19	12.79
HLE.DE	9.83	10.44	10.36	9.91	8.89
600741.SS	19.33	19.44	16.25	14.72	12.79
012330.KS	14.54	14.19	12.73	12.89	13.13
011210.KS	10.85	9.78	9.01	9.30	9.96
IFX.DE	6.31	5.58	5.81	5.59	5.05
0179.HK	9.96	9.08	9.51	9.07	8.21
6473.T	7.83	8.38	8.36	8.65	8.48
JTEKTINDIA.NS	16.01	15.22	15.90	14.05	17.86
7276.T	12.52	13.02	12.89	13.20	12.82
LEA	20.22	18.86	18.39	17.61	16.14
LNR.TO	10.33	9.72	8.83	7.58	6.71
MGA	12.08	13.58	12.60	12.04	11.76
LEVE3.SA	7.17	6.48	6.56	6.88	6.34
MRE.TO	11.54	11.97	10.81	8.42	8.82

0425.HK	6.58	6.80	6.24	6.20	6.58
7280.T	6.81	7.17	7.75	9.21	7.21
5991.T	14.87	14.74	14.36	14.25	13.19
NJDCY	6.97	6.89	6.51	7.00	6.28
600699.SS	7.90	8.90	7.84	9.90	8.31
7230.T	8.65	6.64	7.58	8.28	7.90
NPSKF	7.12	7.15	7.24	7.42	6.55
6472.T	4.00	3.96	3.91	4.24	3.92
OMRNY	7.93	7.47	7.33	7.20	6.62
RML.NS	9.37	9.50	10.64	10.02	9.59
5851.T	5.35	5.72	5.40	5.54	4.96
SHA.DE	7.52	7.18	7.15	6.79	6.69
SMTOY	6.78	6.72	6.45	6.73	6.39
5191.T	9.99	9.31	8.54	8.92	8.49
4523.TWO	3.79	4.72	4.18	2.68	2.58
TEL	7.28	7.62	7.69	7.62	7.28
TEN	11.98	12.18	11.60	7.55	8.22
6995.T	13.53	13.92	13.51	12.98	12.07
5105.T	6.01	5.62	5.96	5.41	4.98
7282.T	13.30	13.83	14.36	15.54	11.96
3116.T	25.49	29.00	30.63	31.16	25.48
7313.T	15.32	15.60	14.99	17.68	16.12
VLEEY	13.86	12.94	11.92	10.55	10.25
VC	8.96	18.70	18.51	16.00	16.69
000559.SZ	6.24	6.92	6.57	5.82	5.20
WEICY	6.03	6.67	8.43	7.86	7.68
200581.SZ	5.81	5.80	6.38	5.98	4.55

Change in investment related cashflow

Stock Code	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019
AH-R.BK	-0.29235	28.6748	-0.26176	-1.72555
ASGLY	-0.02031	0.84478	-0.07210	-1.93924
7283.T	-0.25473	0.22245	-0.32171	-2.65357
7259.T	-0.09219	-0.03435	0.00103	-2.80729
7238.T	-0.43065	0.57578	-0.30125	-1.29961
APELY	0.02052	0.25007	0.75672	-2.01024
AXL	0.21053	5.05226	-0.65300	-1.64115
APTV	-0.65980	1.16609	0.63578	-1.54248
ALV	0.22822	-0.03953	-0.09981	-1.75848
AUTN.SW	-0.24614	1.10884	-0.15841	-1.78385
BWA	-0.77022	0.86121	-0.31610	-1.95044
600742.SS	-3.08976	-4.55206	-0.46188	-3.61181
601799.SS	-48.43463	-0.43441	-0.89143	-3.21923
CIE.MC	1.97487	-0.12690	-0.15984	-3.15787
POM.PA	2.39272	-0.71700	1.29237	-1.56646
CSTM	-0.49446	-0.20000	-0.68836	-4.87912
CTTAY	-0.08790	0.09502	0.04571	-2.00731
CPS	0.19155	0.01188	0.90902	-0.78060
DAN	0.41473	0.59178	-0.20482	-3.43074
DNZOY	3.88623	-0.80171	3.89696	-1.97287
7212.T	0.21058	-0.26356	-0.03301	-1.53773
EO.PA	-0.51740	1.99277	-0.06360	-2.67584
FMIZP.IS	0.11562	-1.00155	-254.79606	-3.54591
5801.T	-1.08273	-19.67540	-0.05616	-1.90451
GNTX	1.80201	-0.69094	1.39113	-1.30519
018880.KS	0.76581	-0.23318	0.66438	-4.35569
HLE.DE	0.18399	0.19351	-0.05432	-1.60798
600741.SS	1.87513	0.68415	0.78572	-1.24023
012330.KS	-0.57069	-0.49845	-0.11410	-1.76292
011210.KS	-0.46284	-0.50123	0.97878	-1.53627
IFX.DE	-0.57655	0.03005	0.02829	-3.13929
0179.HK	6.10600	-0.60716	0.24874	-1.98670
6473.T	-0.03462	0.13589	0.45519	-1.76047
JTEKTINDIA.NS	-0.03213	0.08829	-0.58984	-0.48969
7276.T	0.13059	0.15466	-0.07210	-1.38516
LEA	-0.34000	0.36337	-0.20159	-2.33006
LNR.TO	2.53057	-0.63366	1.99169	-1.31702
MGA	2.31599	-0.50176	0.06955	-2.00000

LEVE3.SA	-0.21647	-0.48335	1.07860	-1.87215
MRE.TO	0.39450	-0.03545	0.38651	-1.97732
0425.HK	-0.11297	1.99754	0.30503	-1.62541
7280.T	0.01965	0.05862	-0.06250	-2.67911
5991.T	0.43769	-0.20992	0.18744	-2.28354
NJDCY	0.17340	1.21871	-0.46133	-2.41197
600699.SS	3.89664	-0.66897	2.12457	-1.39607
7230.T	-0.76586	3.86244	-0.10258	-2.46924
NPSKF	-0.02424	0.19975	-0.02290	-2.37116
6472.T	0.07916	0.22055	0.17323	-2.35684
OMRNY	0.69841	-0.77590	2.71265	-1.62600
RML.NS	-0.12629	0.08713	-0.03686	-1.76820
5851.T	-0.01345	0.02193	-0.24534	-3.29964
SHA.DE	0.13872	0.13059	0.07287	-1.82876
SMTOY	0.35102	0.65972	-0.10555	-2.05931
5191.T	0.97800	-0.04284	-0.15642	-2.02937
4523.TWO	-5.91843	-5.23068	-0.89481	5.19218
TEL	-3.48585	-0.41050	0.17382	-1.63254
TEN	0.12211	0.21471	5.08717	-1.24105
6995.T	-0.38629	-0.48065	0.70334	-2.61531
5105.T	-0.70038	-0.22865	1.67356	-2.34624
7282.T	-0.09884	0.45982	-0.52270	-1.55692
3116.T	-0.06837	0.01749	0.05682	-2.13940
7313.T	0.24210	-0.50951	0.02684	-2.43784
VLEEY	0.69654	0.24529	-0.03948	-1.94928
VC	-0.87193	-1.57947	-0.44000	-2.30612
000559.SZ	0.44189	-0.21162	0.34122	-1.55177
WEICY	3.77050	-0.74340	0.42558	-2.16849
200581.SZ	-0.20372	-2.29498	-0.83490	-6.88837

Net Property Plant and Equipment – 2015 & 2019

Stock Code	12/31/2015	12/31/2019
AH-R.BK	5,846,694,706.00	8,184,917,000.00
ASGLY	982,296,000,000.00	1,177,691,000,000.00
7283.T	64,187,000,000.00	74,899,000,000.00
7259.T	1,006,260,000,000.00	1,479,621,000,000.00
7238.T	111,308,000,000.00	85,930,000,000.00
APELY	140,942,000,000.00	187,646,000,000.00
AXL	1,046,200,000.00	2,358,400,000.00
APTV	3,377,000,000.00	3,722,000,000.00
ALV	1,437,100,000.00	1,972,500,000.00
AUTN.SW	433,500,000.00	942,400,000.00
BWA	2,448,100,000.00	3,010,000,000.00
600742.SS	1,837,758,949.39	3,691,392,023.73
601799.SS	890,349,337.22	1,723,946,302.02
CIE.MC	971,521,000.00	1,523,483,000.00
POM.PA	1,149,215,000.00	1,958,919,000.00
CSTM	1,255,000,000.00	2,056,000,000.00
CTTAY	9,538,900,000.00	14,932,700,000.00
CPS	765,369,000.00	1,071,653,000.00
DAN	1,167,000,000.00	2,443,000,000.00
DNZOY	1,395,706,000,000.00	1,689,949,000,000.00
7212.T	67,527,000,000.00	66,392,000,000.00

EO.PA	2,247,300,000.00	3,874,300,000.00
FMIZP.IS	8,775,746.00	12,761,862.00
5801.T	199,217,000,000.00	229,360,000,000.00
GNTX	412,720,270.00	498,316,100.00
018880.KS	1,092,715,577,410.00	2,335,057,151,370.00
HLE.DE	1,612,331,000.00	1,941,659,000.00
600741.SS	12,989,307,234.78	25,819,389,190.85
012330.KS	7,946,738,000,000.00	8,971,034,000,000.00
011210.KS	2,322,779,882,630.00	2,570,287,000,000.00
IFX.DE	2,093,000,000.00	3,510,000,000.00
0179.HK	410,578,000.00	1,239,935,000.00
6473.T	440,699,000,000.00	465,324,000,000.00
JTEKTINDIA.NS	5,959,150,000.00	4,816,692,000.00
7276.T	140,859,000,000.00	158,769,000,000.00
LEA	1,826,500,000.00	2,704,200,000.00
LNR.TO	1,721,882,000.00	2,758,764,000.00
MGA	6,005,000,000.00	10,071,000,000.00
LEVE3.SA	729,835,000.00	664,068,000.00
MRE.TO	1,202,162,000.00	1,730,273,000.00
0425.HK	4,799,621,000.00	9,737,401,000.00
7280.T	75,565,000,000.00	105,712,000,000.00
5991.T	147,287,000,000.00	172,839,000,000.00
NJDCY	338,978,000,000.00	517,479,000,000.00

600699.SS	3,103,242,733.63	14,904,329,260.18
7230.T	64,868,000,000.00	51,475,000,000.00
NPSKF	334,896,000,000.00	378,333,000,000.00
6472.T	316,052,000,000.00	279,863,000,000.00
OMRNY	151,452,000,000.00	142,712,000,000.00
RML.NS	2,644,100,000.00	3,942,100,000.00
5851.T	120,278,000,000.00	121,607,000,000.00
SHA.DE	4,180,000,000.00	5,548,000,000.00
SMTOY	789,775,000,000.00	885,823,000,000.00
5191.T	159,475,000,000.00	154,335,000,000.00
4523.TWO	668,133,000.00	620,567,000.00
TEL	2,920,000,000.00	3,574,000,000.00
TEN	1,243,000,000.00	3,627,000,000.00
6995.T	104,147,000,000.00	98,947,000,000.00
5105.T	211,062,000,000.00	207,079,000,000.00
7282.T	250,557,000,000.00	257,728,000,000.00
3116.T	241,197,000,000.00	233,978,000,000.00
7313.T	78,769,000,000.00	71,515,000,000.00
VLEEY	2,744,000,000.00	5,346,000,000.00
VC	351,000,000.00	601,000,000.00
000559.SZ	3,405,481,999.33	3,507,423,599.14
WEICY	26,257,021,155.93	40,836,861,927.30
200581.SZ	2,805,599,792.68	3,093,033,855.45

Return on Investment (ROE) – 2012 to 2019

Stock Code	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019
AH-R.BK	0.1908	0.1151	0.0666	0.0540	0.0898	0.1661	0.1689	-0.0251
ASGLY	0.0464	0.0148	0.0143	0.0392	0.0433	0.0585	0.0788	0.0384
7283.T	0.0317	-0.0132	0.0818	0.0794	0.0762	0.0552	0.0515	0.0696
7259.T	0.0762	0.0902	0.0899	0.0665	0.0879	0.1024	0.1027	0.0818
7238.T	-0.0738	0.0111	0.0458	-0.1126	-0.8094	0.0140	0.0288	-6.0577
APELY	0.0362	-0.0606	0.1041	0.1934	0.1707	0.1371	0.1572	0.0605
AXL	-3.0439	2.8125	1.2610	0.7814	0.4542	0.2195	-0.0387	-0.4956
APTV	0.4593	0.4164	0.5382	0.6444	0.5235	0.4107	0.3085	0.2592
ALV	0.1285	0.1220	0.1365	0.1322	0.1542	0.1058	0.1011	0.2188
AUTN.SW	0.0466	0.0623	0.2600	0.1401	0.2430	0.1905	0.1061	-0.2488
BWA	0.1625	0.1753	0.1814	0.1716	0.0368	0.1184	0.2203	0.1585
600742.SS	0.1348	0.1169	0.1521	0.1073	0.0996	0.1026	0.1020	0.0974
601799.SS	0.1034	0.1153	0.1373	0.1401	0.0933	0.1168	0.1398	0.1617
CIE.MC	0.1761	0.1428	0.1443	0.2236	0.2131	0.2645	0.5835	0.3416
POM.PA	0.2237	0.2165	0.2130	0.2040	0.2109	0.2461	0.2557	0.1150
CSTM	0.4385	3.0625	1.1860	-1.0054	-0.0069	-0.0948	1.5410	0.6146
CTTAY	0.2148	0.2134	0.2226	0.2133	0.1964	0.1886	0.1623	-0.0796
CPS	0.1371	0.0776	0.0779	0.1854	0.1993	0.1637	0.1296	0.0789
DAN	0.1628	0.1864	0.2954	0.2184	0.5532	0.1096	0.3175	0.1207
DNZOY	0.0444	0.0789	0.1068	0.0776	0.0782	0.0778	0.0891	0.0708
7212.T	0.1072	-0.2074	0.1283	0.0583	0.0923	0.1199	0.1172	0.0680
EO.PA	0.1090	0.0583	0.0965	0.1551	0.2168	0.1887	0.1889	0.1426
FMIZP.IS	0.2057	0.2575	0.2748	0.3812	0.4188	0.4677	0.5556	0.5288
5801.T	-0.0769	0.0216	0.0316	0.0386	0.0578	0.0850	0.1207	0.1175
GNTX	0.1504	0.1679	0.1837	0.1849	0.1819	0.1985	0.2352	0.2191
018880.KS	0.1658	0.1984	0.1701	0.1321	0.1598	0.1458	0.1363	0.1437
HLE.DE	0.2170	0.1709	0.1699	0.1526	0.1361	0.1539	0.1571	0.2124
600741.SS	0.1611	0.1859	0.1887	0.1754	0.1595	0.1588	0.1769	0.1308

012330.KS	0.2105	0.1702	0.1478	0.1193	0.1066	0.0535	0.0617	0.0709
011210.KS	0.2283	0.1852	0.1525	0.1033	0.0401	-0.0201	-0.0183	0.0179
IFX.DE	0.1194	0.0720	0.1288	0.1355	0.1481	0.1402	0.1668	0.1008
0179.HK	0.1277	0.1220	0.1200	0.1132	0.0937	0.1194	0.1149	0.1131
6473.T	0.0410	0.0381	0.0591	0.0898	0.1069	0.0974	0.0932	0.0460
JTEKTINDIA.NS	0.2036	0.1453	0.2193	0.1172	0.1067	0.0951	0.1156	0.1227
7276.T	0.0835	0.0876	0.0972	0.1340	0.1616	0.1686	0.2032	0.1579
LEA	0.3679	0.1416	0.2273	0.2547	0.3190	0.3164	0.2737	0.1733
LNR.TO	0.1391	0.1699	0.1919	0.1933	0.2016	0.1765	0.1555	0.1068
MGA	0.1520	0.1622	0.2173	0.2245	0.2079	0.1965	0.2146	0.1630
LEVE3.SA	0.1328	0.1465	0.1569	0.1558	0.0200	0.1751	0.2150	0.1987
MRE.TO	0.0823	0.0365	0.1238	0.1379	0.1113	0.1665	0.1614	0.1487
0425.HK	0.1242	0.1303	0.1348	0.1383	0.1622	0.1672	0.1262	0.1180
7280.T	0.0860	0.1461	0.1240	0.1441	0.1121	0.0651	-0.0953	-0.1232
5991.T	0.1081	0.1070	0.1131	0.0909	0.0839	0.0897	0.0700	0.0253
NJDCY	0.1100	0.0192	0.1089	0.1023	0.1201	0.1319	0.1409	0.1111
600699.SS	0.1233	0.1263	0.1433	0.1054	0.0357	0.0312	0.1060	0.0747
7230.T	0.0504	0.0528	0.1118	0.0849	0.2307	0.0363	-0.0637	0.0527
NPSKF	0.1015	0.0492	0.0867	0.1358	0.1445	0.0988	0.1290	0.1040
6472.T	0.0304	-0.0710	-0.0735	0.0952	0.0647	0.0123	0.0804	-0.0302
OMRNY	0.0511	0.0823	0.1073	0.1269	0.1063	0.0980	0.1249	0.1077
RML.NS	0.2381	0.1801	0.1130	0.0809	0.0796	0.0304	0.1054	0.0105
5851.T	0.0570	0.0256	0.0451	0.0374	0.0898	0.0771	0.0676	0.0408
SHA.DE	-0.1430	-0.0628	3.4973	0.3993	0.4528	0.4015	0.2963	0.1517
SMTOY	0.0596	0.0354	0.0561	0.0837	0.0669	0.0760	0.0782	0.0761
5191.T	0.0411	0.0188	0.0237	-0.0246	0.0181	0.0322	0.0215	-0.0317
4523.TWO	0.0111	0.0209	0.0174	-0.0007	0.0002	-0.0724	-0.1109	-0.1395
TEL	0.1395	0.1523	0.1977	0.2525	0.2368	0.1726	0.2368	0.1745
TEN	1.1179	0.4226	0.4547	0.5704	0.6173	0.2974	0.0319	-0.2344
6995.T	0.0502	0.0297	0.0878	0.0867	0.0265	-0.0216	0.1000	0.0791
5105.T	0.0800	0.0842	0.1730	0.0097	-0.0866	0.0973	0.0691	0.1099

7282.T	0.0405	0.0845	0.0936	0.0674	0.0666	0.0516	0.0644	0.0603
3116.T	0.0200	0.0840	0.0608	0.0241	0.0197	0.1969	0.1627	0.0940
7313.T	0.0467	0.1280	0.1576	0.1190	0.1194	0.0924	0.1278	0.1007
VLEEY	0.1852	0.1845	0.2051	0.2099	0.2247	0.2007	0.1194	0.0676
VC	0.0722	0.3594	-0.3410	2.1608	0.1280	0.2763	0.3527	0.1458
000559.SZ	0.0909	0.1537	0.1776	0.1862	0.1917	0.1746	0.1386	0.1031
WEICY	0.1203	0.1288	0.1548	0.0438	0.0769	0.1932	0.2202	0.2013
200581.SZ	0.1027	0.1154	0.1418	0.1286	0.1294	0.1733	0.1506	0.1335