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An empirical examination of sustainability for multinational firms in China: Implications for cleaner production

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ABSTRACT

Globally, sustainability is emerging as a dynamic area of inquiry and innovation. This research is an exploratory study that sought to examine multinational corporations in China. The research aims to examine the pressure from parent companies and develop a conceptual framework to improve sustainability from a set of indicators; it further recognizes the underlying motivators for implementing sustainability practices and discusses their implications. Lastly, it reports the differences in sustainability performance based on firm size which provides insights for addressing sustainability initiatives. Recommendations are offered in the final section based on enough latitude and flexibility within host countries to improve sustainability practices.

Due to the exploratory nature of this study, the data were analyzed based on regressions, factor analysis, cluster analysis and one-way ANOVA on a sample of 229 executive responses analyzed from multinationals in China. Many variables were explored, such as environmental practices; social practices; internal pressures to improve environmental performance; external pressures to improve environmental performance; internal pressures to improve external environmental performance; and barriers to adoption. The article concludes by arguing that greater emphasis on management in the host country is required for sustainability practices and makes an important theoretical and practical contribution to the literature within this realm.

1. Introduction

Environmental and economic roles in China have evolved over the last few years. It is now the largest developing country and has the world's most serious environmental pollution issues (Paillé et al., 2014). It has been argued that pollution issues are mainly caused by China's non-sustainable industrial processes, as opposed to those in Western countries. In recent years, China has recognized sustainability as a long-term priority for health and economic development and has set ambitious targets to combat this problem (DeFrancia, 2018). Unlike Western countries, its approach for addressing such environmental issues is more from an institutionalized, governance perspective (Guttman et al., 2018). Many multinational corporations (hereafter MNCs) operate in China, with different expectations from various stakeholders that are likely to increase the gravity of governance for sustainability.

MNCs operate in the host country and benefit from the lower costs of capital and labor, and in some cases, the abundant natural resources from extracted minerals, forestry and agriculture. Many

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MNCs take advantage of the economies of scale, commodity prices and opportunities for innovation while, at the same time, striving for competitive excellence, both in terms of the cost of the product and its operations. On the other hand, they also impart technical know-how and create jobs within their host markets. Thus, they are generally welcome in the host country and produce a good return for their investment. However, sustainability issues regarding MNCs' adoption within the host country context have seldom been investigated. In their home country, MNCs are often proactive towards sustainability, including reporting on relevant processes and outcomes to demonstrate their commitment and accountability to a broad range of stakeholders (Kolk, 2003, 2010). In contrast, MNCs are rarely the best performers and/or are less likely to take similar sustainable actions in a host country. For example, Tan (2009) found that MNCs often use double standards in their operating policies, failing to support the institutional social practices they would perform at home. This is broadly due to the lenient regulatory systems in some countries such as China, with institutional loopholes that often provide environmental exploitation opportunities for MNCs. Thus, MNCs have been equally perceived, as both a problem and a potential solution to major sustainability concerns (Vigneau et al., 2015).

Little is known about MNCs' sustainability behaviors in host countries such as China, more particularly in terms of the social and environmental dimensions and the internal and external pressures they encounter, both from a parent company and the host country standpoint. Their long-term perspective trajectory for implementing sustainability systems is absent in the literature. Given the lack of accountability for sustainability measures within MNCs, it was deemed necessary to undertake further research to gain a better understanding of the antecedents that influence sustainability.

First, the research examines pressure from MNCs to improve sustainability through a set of indicators extending Collins et al.'s (2007) work by addressing the key sustainability factors/antecedents. Second, it identifies the motivators for implementing sustainability practices and discusses their implications. Third, it reports the differences in sustainability performance based on the firm's size which provides insights for improving sustainability measures. Recommendations are offered in the final section based on sufficient latitude and flexibility existing within host countries. This study has sought to identify the antecedents of sustainability among MNCs in China based on the social and economic dimensions. The focus of sustainability concerns for this research lies mainly within the environmental and social domains.

This study makes the following contribution. First, the study develops a framework that is explored from a multi-faceted perspective on sustainability. Second, the research identifies motivators for implementing sustainability practices, which is critical for improving sustainability. Lastly, it empirically examines the difference in sustainability performances based on the firm's size. These developments alongside responsible management will help firms improve sustainability that will ultimately support the UN sustainable development goals. Together, the three findings make an important theoretical and practical contribution to the literature in this important realm.

The study is organized as follows. First, the literature is reviewed followed by developing the foundation and sustainability framework within MNCs. Next, the methodology is discussed, and the data analyzed. Finally, the findings, discussions, and conclusions are presented.

2. Sustainability imperatives

Establishing guidelines to help firms develop sustainability strategies and antecedents is an important investigation, particularly when considering the millennium development goals (MDGs). The UN General Assembly first recommended a set of global sustainable development goals (SDGs) consisting of 17 goals and 169 targets. Some of these incorporated the preceding MDGs while others were founded on innovative ideas (Hák et al., 2016).

Since then there have been suggestions for revising sustainable development (SD) to include security of people and the planet, via a unified set of SDGs where MDGs are combined with science-based global environmental targets and prevailing international agreements (Griggs et al., 2013). Griggs et al. (2013, p. 306) viewed the three pillars of Sustainable Development (i.e., economic, social and environmental) as a nested notion and redefined it to include "development that meets the needs of the present while safeguarding earth's life-support system, on which the welfare of current and future generations depends". These authors also recommended retaining the driving principles such as reducing poverty and hunger, improving health and wellbeing, and creating sustainable production and consumption patterns.

The more recent SDGs are seen as ambitious challenges. Arguably, the preceding approaches to SD lacked integration with respect to strategies, policies, and implementation (Le Blanc, 2015). Through network analysis techniques, Le Blanc (2015) showed that most thematic connections are strong and weak and that SDGs as a whole is a more integrated system than MDGs and requires policy integration across sectors. These SDGs have taken priority to achieve two important directives: 1) to align and interconnect social and environmental priorities, and 2) to provide firms with clear guidelines for addressing them.

It is very clear with the 2030 Agenda for Sustainable Development that the 17 sustainable development goals require interconnecting social and environmental priorities and guidelines. At the same time recognizing that any action in one area will affect the outcomes in other areas. To attain this, it is also suggested that it requires the partnership of governments, the private sector, civil society, and citizens. Based on approaching this issue within MNCs, the first step for MNCs in host countries should be to identify the underlying sustainability imperatives and factors that affect sustainability; and create partnerships with the government, communities or citizens to enable them to facilitate their sustainable development goals and objectives. This would inspire MNCs to develop strong incentives for integrating SDGs into their operations, such as good governance; imposing MNCs to lead by example, for instance, improving workplace conditions and respect for workers' rights, just as in their own country. Maintaining their own environmental standards, that are similar to home, such as meeting external evaluation and verification of their production process. To address these issues, one has to understand the type of external and internal pressures they encounter, their barriers and motivators to implement and the balance between their resources.

Therefore, research is essential in understanding this critical area. The following paragraph develops the conceptual model and provides a broad understanding of sustainability issues that will attempt to further improve important and strategic insights for MNCs in developing countries.

3. Development of conceptual framework

As a driving force of global economic development, China has a greater responsibility in protecting the environment (Tang et al., 2018). Even though governments play a central role in governing sustainability, they are not exclusively responsible; many are often challenged and developed as the process of adhering to sustainability governance unfolds (Bulkeley and Schroeder, 2012). Relevant recent studies have shown a paradigm shift from what sustainability typically means to firms in China, to how they

advocate sustainability within firms; this is now a crucial aspect of theory development (Chang et al., 2017). Changes are required right from the supply end to the retail and consumer end while keeping in mind the impact on the macro environment.

The need for firms to 'go green' is not new (Gladwin et al., 1995; Shrivastava (1995). While concerns for environmental values will persuade some firms to cultivate ecological responses (Hage and Dewar, 1973), many firms have also implemented 'green' goals. Should the world economy shift towards an ecological orientation, it will change the way businesses operate to meet consumer preferences, industrial demand and competitive landscape (Shrivastava, 1995). The SDGs now impose a collective agreement that businesses need to enforce and changes are imperative.

Many firms have their own reasons for adopting sustainability. Beyond the rationale for the protection of the environment, potential improvements in performance, profitability, loyalty and stakeholder relationships (e.g., investors, customers, and suppliers) are critical motivators of sustainability strategies (Dieste and Panizzolo, 2018). Now often envisaged as a global problem, firms are increasingly recognizing and finding ways to address sustainability issues, primarily to safeguard their competitiveness and long-term success (Paillé et al., 2014). MNCs in host countries should be no exception to find ways to address sustainability, given that it is widespread within their own organizations. For instance, sustainability within supply networks has been examined by van Bommel (2011). Kleindorfer et al. (2005) proposed a framework for developing sustainability in operations management, while Carter and Rogers (2008) and Seuring and Müller's (2008) framework of sustainability hinges on the management of supply chains. Similarly, Sarkis (2003) created a strategic framework in the process of greening the supply chain to support green decisions. Likewise, Khalid and Seuring (2019)link sustainability and supply chain constructs with the bottom of the pyramid literature and contributed to the advancement of the debate.

There are also differences between large, small and medium-sized firms. Shevchenko et al. (2016) are of the view that a firm's response to becoming truly sustainable relies on its capabilities. While large firms manage external stakeholders' expectations to become sustainable, the smaller ones are more inclined to change based on their internal readiness to change. It was also found that process-driven versus product-driven green initiatives would differ with firm size (Gilley et al., 2000).

With respect to institutional practices, Surroca et al. (2013) discuss and support the view that MNCs are in an exclusive position to exploit cross-national differences in institutional environments (Hall and Soskice, 2001). Similarly, they also support Ghemawat's (2007) views that when institutional environments in host countries provide comparative advantages, 'arbitrage' can be used in production and operations across countries to leverage location advantages.

Surroca et al. (2013) use institutional theory to propose that increasing stakeholder pressure in an MNC's home country leads to the transfer of socially irresponsible practices to its subsidiaries. Within the institutional theory framework, the agency approach suggests that organizations may engage in self-seeking behaviors in response to the pressure to conform to stakeholders' expectations (Oliver, 1991).

Through institutional isomorphism, stakeholders apply pressure on firms by evaluating their value systems, prevailing regulations and shared social knowledge and cognitive structures (DiMaggio and Powell, 1983). Pollution Havens and less stringent environmental regulations in subsidiaries indicate that social pressures at home can explain the relocation of irregular corporate social responsibility activities (Surroca et al., 2013). MNCs use exit or relocation strategies to circumvent rising institutional pressure at home (Witt and Lewin, 2007).

In terms of regulations, many governments implement market-based policies and instruments such as taxes and trading permits to encourage environmental protection. Such regulatory systems either command/control or lead to voluntary agreements between government and industry to stimulate sustainable business practices.

The increasing degradation of ecological systems and industrial pollution has compelled the Chinese government to recognize the balance between economic development and sustainability by introducing a new regulatory policy called the 'circular economy' (CE) (Park, 2008). China has also developed the National Sustainability Strategy, which is the 12th Five-Year Plan. It outlines a balanced model aiming for not only stable and fast economic growth but also citizen prosperity. Research shows China has invested in sustainable communities in terms of regulations (Guo et al., 2013; Jiuchang et al., 2010). The regional regulations have several implementations but will all follow the same guidelines drawn from the national strategy.

Bansal and Roth (2000) found that not only corporate ecological responsiveness help identify their ecologically-based behavior but also if firms go green merely to meet legislative requirements, the firms follow only those activities mandated by legislative policies. This determines the relative efficacy of a firm's command and control regulation, market mechanisms and voluntary undertaking (Bansal and Roth, 2000). Many firms resort to a country's regulatory compliance to avoid sanctions (Hart, 1997).

Often operations that are not tolerated at home are regarded as acceptable in a host country (Witt and Lewin, 2007). This type of behavior has been recognized as the 'pollution haven hypothesis'. The pollution haven hypothesis postulates that when advanced countries seek to establish factories overseas, they look for economical resource options such as land, labor, and capital, often resulting in unsound environmental practices (Levinson and Taylor, 2008). There are several ways addressed above that sustainability can be impacted, using institutional theory for increasing stakeholder pressure or regulatory measures. The other ways by which sustainability can be encouraged and facilitated is through the antecedents of sustainability.

Many antecedents of sustainability can be found, for example, firms often use integrated measures and practices such as recycling programs, environmental statements and reports, environmental impacts, end-of-pipe measures, and environmental management systems (thereafter EMSs) to manage sustainability and increase their financial standing. These often appear to be more mandatory than obligatory, with firms at times going beyond what is required to support sustainability. Business performance levels and institutional pressures also play a central role in the mandating of a firm's sustainability objectives.

Other antecedents that are critical to sustainable practices include personal values, preferences, and satisfaction with the profession, as well as product quality and customer expectations (Gabzdylova et al., 2009). Such external drivers are in the interests of stakeholders, while internal drivers are motivated by the firm itself; many firms are now significantly affected by external pressures, and subsequently expand their sustainability programs beyond their stakeholders' interests (Ocampo and Clark, 2014). It has been found that senior managers are often reactive to the pressures of stakeholders beyond those of customers and suppliers when they are required to create manufacturing strategies, although they may not be as focused on social practices as they are on sustainable environmental practices. In addition, research shows quality and innovation-oriented manufacturing is closely associated with social practices (Galeazzo and Klassen, 2015).

Such external pressures to improve a firm's environmental

performance are often driven by a range of stakeholders including customers, competitors, government and pressure groups. It has been identified that government regulations and competitors often drive the adoption of environmental strategies (Russo and Fouts, 1997; Sharma and Vredenburg, 1998). The resulting Environmental Management Systems (EMS) generally help to improve the environmental impact of the firm. Various industry associations, governments, and international firms have highlighted the benefits of firms establishing an EMS where their standards are used as guidelines (Morrow and Rondinelli, 2002). Several MNCs have designed, certified and implemented EMSs, including those based on ISO 14000 because they provide a standard of consistency for managing a firm's environmental impacts (Morrow and Rondinelli, 2002; Tibor and Feldman, 1996).

In addition, Collins et al. (2010) found increased adoption of social practices within some firms where values and beliefs were the dominating drivers, followed by reputation and brand as significant drivers also. In terms of sustainability initiatives, cost, resources and knowledge/skills are the three commonly reported barriers to adoption and can be seen as an important antecedent to improved sustainability. Similarly, Collins et al. (2007) advocated firm size as the most significant determinant for good environmental practices. For example, one-third of the firms noted the existence of barriers to the adoption of sustainable practices, with larger firms more likely to suggest cost initiatives. Several differences were also noted between firm sizes in relation to the adoption of social practices.

There is a considerable body of literature describing frameworks and models of sustainability (Robinson, 2004), and understanding the pressures enforced by the various stakeholders, more particularly, if the parent company is weak. It is critical for MNCs to recognize the changing role of sustainable operations in host countries and adapt consequently. Thus, a framework is required to assist managers to understand and address complexity and vitality in sustainability (Chen et al., 2009).

Stemming from earlier research, a framework in relation to the sustainability actions of MNCs was developed in this study, to help understand MNC sustainability disposition and host country discourse. This conceptual framework is based on the assumption that the contextual findings of the above-cited research may enhance understanding of the sustainability-wide choices that influence firms (see Fig. 1). It seeks to address the key sustainability factors/antecedents, as put forward in their research by Collins et al. (2007). This framework will be used by this study to explore MNCs' sustainability antecedents for firms in China, along with a similar questionnaire adopted by Collins et al. (2007).

4. Sustainability considerations in MNCs – analysis 1

As parent companies, MNCs are often able to control their activities in host countries. Researchers such as Johnson et al. (2001) have contended that international joint ventures with host countries involve some form of control, either direct where the parent company openly dictates and influences local operations, or indirect where there is more of a consultative business relationship. They have also suggested that motivations that drive such control include experience, strategic importance, product similarity, and resource dependence. It has also been noted that parent firms can acquire local market knowledge from the foreign host country subsidiary (Rabbiosi and Santangelo, 2013) enabling them to make sounder business decisions regarding sustainability.

The parent company's level of control can also influence a firm's ability in the host country to achieve strategic goals, based on its capacity to direct the activities of its business operations (Geringer and Frayne, 1990). Furthermore, the level of control the parent company is able to exercise over the affiliated firm is often dependent on how much it invests in the local market (Ghoshal and Nohria, 1989).

Thus, based on the above discussion and to understand sustainability issues, this study empirically investigates corporate responses of 229 MNCs in China.

5. Methodology

This project is part of a larger one in which a scoping study was conducted with MNCs in China that has provided the foundation for this project. For this study, the questionnaire items were drawn from Collins et al. (2007) and were modified to suit the research questions. Participants were asked to rate their responses on a 5-point Likert-type scale, anchored from 1 'strongly unimportant' to 5 'strongly important'. Since this study was conducted in China, the questionnaire was translated into Chinese and then translated back into English; a bilingual person compared the two original language styles. After modifying the questionnaire it was further tested on a group of English-speaking Chinese participants for accuracy before proceeding with the data collection.

The Australian Market Research firm recruited its China-based market research company to administer the data collection. They first conducted a soft launch with 38 MNCs in China, and the questions were modified accordingly. As the primary interest was in obtaining responses from senior managers, directors/CEOs and C-level executives, entry and mid-level employees were not included in this survey. A sample of 229 MNC executives in China was achieved, which was considered adequate for this study (Hair et al., 2008). Firms operating only in China were excluded from this study. The participants were specifically asked at the start, whether their company was a multinational firm. Quality assurance was conducted by the China-based market research firm with respect to quality standards, including cross-referencing of the sample profile data with survey responses, data cleaning, data validating (edits), and reducing/eliminating data errors. Responses were then loaded into an SPSS database. To achieve a wider sample distribution, it was considered necessary to approach different states in China depending on their location and concentration of industries. The sample was comprised of 32% of MNCs located in Shanghai, 20% in Beijing; 16% in Guangzhou, 7% in Shenzhen, and the remaining 2% were from Chongqing, Tianjin, Wuhan, Chengdu, Hangzhou and a few other states in China.

5.1. Analysis 1

Given the exploratory nature of this study, the data were analyzed based on linear regressions, factor analysis, cluster analysis, and one-way ANOVA. The following six antecedent factors were extracted: 1) environmental practices; 2) social practices; 3) internal pressures to improve environmental performance; 4) external pressures to improve environmental performance; 5) internal pressures to improve social performance, and 6) barriers to adoption. Factor analysis using a principal components extraction method was used, as the intention was to identify and compute composite scores for these factors. Factor scores from the factor analysis were calculated for each of the six antecedents and were used as independent variables in the regression analysis. In addition, before using the variables in the framework, all were parcelled using the one-factor extraction procedure, to achieve a more parsimonious model, including minimizing the chances of residuals and reducing sampling error sources (Little et al., 2002). Table 1 below gives the descriptive statistics, alpha values, and factor loadings.

Cronbach's alpha was used to examine internal consistency

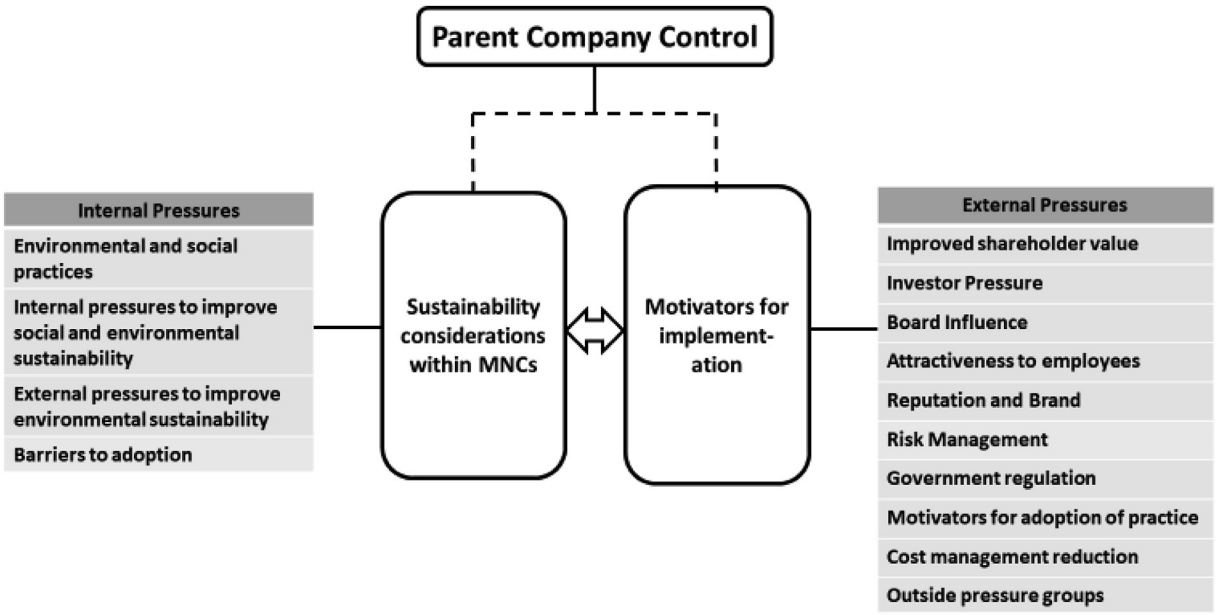

Fig. 1. Framework of sustainability antecedents for firms.

within the scales. The alpha levels ranged from reasonable to moderately high (see Table 1), and few items had to be deleted to increase the alpha levels. George and Mallery (2007) previously indicated that alpha scores within the 0.6 range are questionable, while below 0.6 is mostly unacceptable (Murphy and Davidshofer, 1988). Thus, the survey reliability was assessed in terms of internal consistency on the set of selected scale items.

This study also made use of multiple linear regression analysis to predict the probability of an outcome variable based on the above six predictor variables (Field, 2005). This analysis governs the direction, magnitude and significance of relationships, which was pertinent to the aims of this study (Tabachnick and Fidell, 2001a). Here the dependent variable consisted of the following: 1) internal pressures to improve environmental practices from the parent company; and 2) internal pressures to improve social practices from the parent company. Together they accounted for internal Parent Company Pressure. The alpha value was 0.64, the mean 3.94 and the standard deviation (std dev.) 0.886.

The dependent variable is the Parent company pressure, whereby, the R-square shows that the model explained 47.1% of the variance in the main dependent variable of parent company pressure, which was deemed as a reasonably good result. Furthermore, from the multiple regression analysis, variance in the dependent variable (parent company pressure) was significant (0.000) at $F(6,222) = 32.922$, $p < .000$.

Table 2 below shows the coefficients, where the beta standardized coefficients explain the relative strength of each predictor.

5.2. Results analysis 1

These regression coefficients also highlighted the relationships between parent company pressure and each of the predictors. Only two independent variables were found to be significant for influencing pressure from the parent company. For example, the beta coefficient for external environmental pressure was $0.180(t = 2.050, p < .05)$, which was significant at the 0.05 level, as well as, barriers for adoption at $0.302(t = 3.894, p < .001)$. The positive relationships between these independent variables indicate that pressure from external sources to improve environmental practices and barriers to adoption both influence parent company pressure. The magnitude of the regression coefficients indicates that barriers to adoption have a stronger impact on the prediction model than external environmental pressure. Furthermore, the tolerance levels were greater than 0.10, indicating that multiple correlations with other variables were low; and VIF values were below 10, suggesting no multicollinearity concerns.

a. Internal pressures to improve environmental practices from parent company

The majority of the small (81%), medium-sized (69%) and half of the large (50%) firms agreed to internal pressures from the parent company to improve environmental practices. Similarly, 81% of small, 66% of medium-sized firms and 50% of large firms agreed with having shareholder pressure to improve the environment.

Around 82% of the small, 66% of medium-sized and 36% of large firms agreed that the internal pressure came from employees. Many of the small (77%) and medium-sized firms (75%), as compared with large (50%), agreed with commitment from management for environmental pressures. While 10% of the small, 13% of medium-sized and 14% of large firms disagreed that no-one had any influence on internal pressure to improve environmental practices.

b. External pressures to improve environmental issues from parent company

The majority of the small (84%) and medium-sized (89%) firms agreed to face customer pressure to improve environmental issues, as compared with 42% of large firms. Similarly, many of the small firms (88%) and medium-sized (70%), as compared to large firms (57%), agreed to face competitor pressure to improve environmental issues. A large number of small (79%) and medium-sized (77%) and some large firms (50%) agreed to face local government pressures to improve environmental issues. The local government had a similar ratio to the central government with small (80%), medium-sized (75%) and large firms (57%) agreeing to local government pressures to improve environmental issues. Pressure

Table 1
Descriptive statistics, alpha values, and factor loadings.

Environmental practices Alpha .853	FL	Mean	Std dev.
Q10 - Has an environmental management system	0.740	4.2	0.824
Q10 - Has an environment-focused supplier program	0.732	4.07	0.824
Q10 - Participates in voluntary environmental program	0.704	4.2	0.786
Q10 - Makes marketing claims based on environmental claims	0.706	4.09	0.714
Q10 - Is a member of an environmental group	0.675	4.19	0.826
Q10 - Recycling program	0.666	4.11	0.77
Q10 - Produces an environment/sustainability report	0.662	4.17	0.788
Q10 - A company environmental statement	0.656	4.22	0.693
Q10 - Considers environmental impact	0.558	4.26	0.731
Social practices Alpha .833			
Q11 - Has stress management initiatives	0.735	4.08	0.785
Q11 - Gives time or money to local community projects	0.729	4.1	0.777
Q11 - Contributes to charity	0.715	4.07	0.811
Q11 - Provides flexi-time	0.7	4.02	0.91
Q11 - Has family-friendly policies	0.655	4.12	0.794
Q11 - Provides job training	0.651	4.25	0.735
Q11 - Provides assistance for employees to obtain tertiary education	0.648	4.19	0.748
Internal pressures to improve environmental practices Alpha .757			
Q12 - Employees	0.815	3.9	0.941
Q12 - Shareholders	0.801	3.96	0.921
Q12 - Personal values, beliefs, commitments of management	0.712	3.98	0.883
Q12 - No one	0.602	3.46	1.32
Internal pressures to improve social practices Alpha .632			
Q13 - Shareholders	0.745	4.06	0.80
Q13 - Employees	0.755	3.96	0.78
Q13 - Personal values, beliefs, commitments of management	0.766	3.95	0.87
Q13 - No one	0.589	3.30	1.40
External pressures to improve environmental practices Alpha .725			
Q14 - Local government	0.753	4.08	0.802
Q14 - Pressure groups	0.726	3.81	0.948
Q14 - Customers	0.683	4.04	0.777
Q14 - Central government	0.666	4.01	0.781
Q14 - No external pressures	0.589	3.32	1.38
Q14 - Competitors	0.573	4.07	0.833
Barriers to adoption Alpha .728			
Q15 - Management time	0.759	4.01	0.819
Q15 - Not seen as important in the firm	0.711	3.54	1.13
Q15 - Other priorities are more important	0.702	3.9	0.872
Q15 - Cost implications	0.68	4.12	0.715
Q15 - Knowledge and skills	0.633	4.04	0.78

Table 2
Regression coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.024	0.035		114.76	0.000
	Environmental practices	0.096	0.057	0.133	1.681	0.094
	Social practices	−0.015	0.052	−0.021	−0.291	0.771
	External pressures environmental practices	0.13	0.063	0.18	2.05	0.042
	Barriers for adoption	0.217	0.056	0.302	3.894	0.000
	Internal pressures environmental	0.083	0.058	0.116	1.425	0.156
	Internal pressures to improve social practices	0.061	0.063	0.085	0.98	0.328

groups were not as influential, with 35% of large firms agreeing compared to small (70%) and medium-sized (68%). There were also a small number of firms that disagreed with having no-one exert any external pressure for improving environmental issues, small (9%), medium-sized (19%) and large (14%).

6. Factors likely to influence the implementation of sustainability and motivators for adoption – analysis 2

The second stage analyzed motivators to implement the conceptual framework most likely to influence sustainability. This part of the research considered dependent variable factors (see Table 3), such as improved shareholder value, investor pressure, board influence, attractiveness to employees, reputation and brand, risk management, government regulation, motivators for the adoption of sustainable practices, cost management reduction, and external pressure groups. Participants were asked to rate their responses on a 5-point Likert-type scale anchored from 1 'strongly unimportant' to 5 'strongly important'.

The six independent variables examined were the same as in Stage One of the study: 1) environmental practices; 2) social practices; 3) internal pressures to improve environmental performance; 4) external pressures to improve environmental performance; 5) internal pressures to improve social performance, and 6) barriers to adoption.

6.1. Results analysis 2

For all the analysis in Table 3 below, tolerance levels were greater than 0.10, which indicates that multiple correlations with other variables were low. VIF values were below 10, suggesting no multicollinearity concerns. In Table 3, the R-square ranged from 27% to 41%, which was moderate to high, and significance was listed in the third column. It was noted that all variables were significant at the $p < .000$ level.

Table 3 shows what motivators MNCs consider necessary to implement. With improved shareholder value as a motivator, apart from environmental practices, internal pressures to improve environmental and social practices were found to be significant. Investor pressures found environmental practices and internal pressures to improve social practices as significant. While with board influence, environmental practices and barriers to adopt sustainable practices were found to be significant. This is an important finding, as it indicates firms may be struggling to enhance their sustainability performance.

The reputation of the brand, as well as attractiveness to employees, show both environmental practices and internal pressure to improve social practices as significant which directly impacts employee welfare. Risk management found both environmental practices and external pressures to improve environmental practices as significant. The environment is seen as more critical to risk management than social practices.

In terms of Government regulations, many of the internal and external factors were found to be significant as well as barriers to adoption. With the exclusion of social practices, all of the independent variables had a significant influence on government regulations, that is, MNCs consider government regulations an important motivator. MNCs are generally obliged to follow the host country's regulations. In some cases, it is understood that influential MNCs are given the opportunity to contribute by undertaking consultations with the government when regulations are being drafted. More particularly, MNCs cooperate with local companies to influence public policies in China (Kennedy, 2007).

Motivators for the adoption of sustainability practices showed significance for environmental practices, internal pressure to improve social practices and barriers to adoption. While only barriers to adoption were found to influence cost management reduction. Interestingly with external pressure groups, of significance was internal pressure to improve environmental performance, external pressure to improve environmental practices and barriers to adoption.

7. Firm size – analysis 3

The third stage of the analysis considered the size of the firm and the mean differences among the six sustainability variables under consideration. Firm size appears to be an important factor (Gabzdylova et al., 2009), from which inferences can be drawn. As per the size of a firm, large firms have the resources to invest in sustainability resources. The size of a company and company sectors such as agriculture and manufacturing can have a significant influence on sustainability, particularly in the areas of land

Table 3
Motivators for implementation.

Dependent variables	R-square	Significance	Independent variables
Improved shareholder value	0.357	$F(6, 222) = 20.560$, $p < .000$	- Environmental practices ($\beta = .17$, $p < .05$) - Internal pressures to improve environmental practices ($\beta = .222$, $p < .05$). - Internal pressures to improve social practices ($\beta = .181$, $p < .05$).
Investor pressures	0.306	$F(6, 222) = 16.283$, $p < .000$	- Environmental practices ($\beta = .29$, $p < .001$) - Internal pressures to improve social practices ($\beta = .216$, $p < .01$).
Board influence	0.363	$F(6, 222) = 21.046$, $p < .000$	- Environmental practices ($\beta = .24$, $p < .001$) - Barriers to adopt sustainable practices ($\beta = .189$, $p < .01$).
Attractiveness to employees	0.316	$F(6, 222) = 17.086$, $p < .000$	- Environmental practices ($\beta = .300$, $p < .001$) - Internal pressures to improve social practices ($\beta = .180$, $p < .005$).
Reputation and brand	0.269	$F(6, 222) = 13.615$, $p < .000$	- Environmental practices ($\beta = .267$, $p < .001$) - Internal pressures to improve social practices ($\beta = .259$, $p < .005$).
Risk management	0.377	$F(6, 222) = 22.369$, $p < .000$	- Environmental practices ($\beta = .251$, $p < .05$) - External pressures to improve environmental practices ($\beta = .248$, $p < .05$).
Government regulations	0.348	$F(6, 222) = 19.784$, $p < .000$	- Environmental practices ($\beta = .261$, $p < .005$) - Internal pressures to improve environmental practices ($\beta = -.300$, $p < .005$) - Internal pressures to improve social practices ($\beta = .208$, $p < .05$); - External pressures to improve environmental practices ($\beta = .231$, $p < .05$); - Barriers to adopt sustainability ($\beta = .228$, $p < .05$).
Motivators for adoption of sustainability practices	0.331	$F(6, 222) = 18.268$, $p < .000$	- Environmental practices ($\beta = .221$, $p < .05$); - Internal pressure to improve social practices ($\beta = .211$, $p < .05$); - Barriers to adoption ($\beta = .198$, $p < .05$)
Cost management reduction	0.319	$F(6, 222) = 17.302$, $p < .000$	- Barriers to adoption ($\beta = .45$, $p < .000$)
External pressure groups	0.419	$F(6, 222) = 26.703$, $p < .000$	- Internal pressure to improve environmental performance ($\beta = .245$, $p < .005$); - External pressure to improve environmental practices ($\beta = .300$, $p < .005$); - Barriers to adoption ($\beta = .211$, $p < .05$)

conservation, innovative product integration and end-of-pipe environmental protection (Cleff and Rennings, 1999). Small to medium enterprises (SMEs) are often perceived as primary contributors to sustainable development, with sustainability behavior that can vary from being resistant, reactive, anticipatory and innovation-based to being sustainability-rooted (Klewitz and Hansen, 2014). Burch (2018) recognized sustainability as more important among SMEs, both personally and for their company, in comparison with larger firms; social issues including employee wellbeing and community reputation were the most frequently cited motivations for their sustainability progress, followed by profit growth. Firm size is often based on the overall number of employees (Henri and Journeault, 2008), with some countries defining SMEs as those with fewer than 99 employees, and medium-sized firms as those with 100–499 employees (Burch et al., 2016; Klewitz and Hansen, 2014).

7.1. Results analysis 3

The interdependence multivariate cluster analysis technique was used here to identify those groups that are similar to each other. Ward's hierarchical clustering method involving squared Euclidean distances was also used to determine the three groups (Tabachnick and Fidell, 2001b). In this study, the number of employees was used to separate the three groups (see Table 4a), given the diversity of the industries which included manufacturing, agriculture, technology, and services. Ward's method tends to result in clusters with approximately the same number of objects. The coefficients of the agglomeration schedule identified 2–3 clusters for each group; the differences in the sizes of the error coefficients between the three-cluster and four-cluster solutions were relatively small compared to the two-cluster solution. Thus, three clusters were selected. Further, to verify whether the differences between these groups' means were statistically significant, an ANOVA test was conducted. The mean for group 1 ($n = 84$) was 1572.55 with a standard deviation of 307.19; for group 2 ($n = 131$) the mean was 478.61 with a standard deviation of 232.9, and for group 3 ($n = 14$) the mean was 3900.0 with a standard deviation of 1138.8. The ANOVA showed that the differences in the means of the clusters for all of the employee variables were highly significant (0.000) thus rejecting the null hypothesis of no differences between the groups.

In this study, comparisons were also made among the small, medium and large-sized companies. A one-way ANOVA between these subjects was conducted to compare firm size on environmental practices for MNCs. There were 84 medium-sized, 131 small-sized and 14 large-sized firms reported in the sample. As the sample sizes were unequal between the three groups, it was deemed as likely to have type 1 errors; thus, the Welch and Brown-Forsythe tests and the Games-Howell post hoc test was used. The three variables pertaining to the environment were significant: 1) environmental practices; 2) internal pressures for improving environmental practices; and 3) external pressures for improving environmental practices. These all scored <0.005 for the Welch and Brown-Forsythe tests.

The one-way ANOVA between these subjects was also conducted to compare the influences of environmental practices among the small, medium and large-sized firms. The results showed a significant effect on environmental practices at the $p < .05$ level for small and medium-sized firms. As highlighted in Table 4babove, comparisons via the Games-Howell test showed that the mean score for medium-sized firms ($M = 4.32$, $SD = .46$) was similar to small-sized firms ($M = 4.11$, $SD = 0.51$) and differed with large-sized firms ($M = 3.95$, $SD = 0.55$) firms. The dependent variable was environmental practices. In combination, these results suggest that firm size influences environmental practices. The effect size shows that around 84.6% of the variability in firm size was explained by environmental practices. This research shows that SMEs have significantly different means for environmental practices.

The one-way ANOVA between these subjects was also conducted to compare the effects of internal pressures to improve environmental practices on small, medium and large-sized firms. The results showed a significant effect on environmental practices at the $p < .05$ level for all three firm sizes. As highlighted in Table 5 above, comparisons via the Games-Howell test indicated that the mean for medium-sized firms ($M = 4.00$, $SD = .67$) was significantly different from both small ($M = 3.79$, $SD = 0.72$) and large-sized firms ($M = 3.41$, $SD = 0.64$). The dependent variable was internal pressure to improve environmental practices.

However, large-sized firms significantly differed from medium-sized firms. The effect size shows that around 63.7% of the variability in firm size was explained by internal pressures to improve environmental practices. In combination, these results suggest that internal pressures improve environmental practices among small, medium and large-sized firms that affect sustainability practices. In particular, this research suggests that large and medium-sized firms have significantly different mean values on internal pressures to improve environmental practices.

The one-way ANOVA between these subjects was conducted to compare the effect of external pressures to improve environmental practices among small, medium and large-sized firms. The results showed a significant effect on environmental practices at the $p < .05$ level for the three firm sizes. The dependent variable was – external pressures to improve environmental practices. As highlighted in Table 6 above, comparisons via the Games-Howell test indicated that the mean for medium-sized firms ($M = 4.01$, $SD = .61$) was not significantly different from small ($M = 3.84$, $SD = 0.58$) and large-sized firms ($M = 3.50$, $SD = 0.68$). However, large-sized firms significantly differed from medium-sized firms. In combination, these results suggest that external pressures improve environmental practices differ based on firm size. The effect size shows that around 70% of the variability in firm size was explained by external pressures to improve environmental practices. In particular, it suggests that large and medium-sized firms differ significantly from small firms with respect to external pressures to improve environmental practices. While this is supportive of the previously mentioned literature, the effect of pressure to improve

Table 4a
Descriptives.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
1	84	4.3234	.46143	.05035	4.2233	4.4235	3.00	5.00
2	131	4.1164	.51760	.04522	4.0269	4.2059	2.50	5.00
3	14	3.9524	.55635	.14869	3.6312	4.2736	3.08	5.00
Total	229	4.1823	.51087	.03376	4.1158	4.2488	2.50	5.00

Table 4b
Multiple comparisons of Firm Size and Environmental Practices.

(I) CLUS3	(J) CLUS3	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
1	2	.20700[a]	.06767	.007	.0471	.3669
	3	.37103	.15698	.075	-.0337	.7758
2	1	-.20700[a]	.06767	.007	-.3669	-.0471
	3	.16403	.15542	.555	-.2383	.5663
3	1	-.37103	.15698	.075	-.7758	.0337
	2	-.16403	.15542	.555	-.5663	.2383

[a] Mean difference is significant at the 0.05 level.

Table 5
Multiple comparisons of Firm Size and Internal Pressures to Improve Environmental Practices.

(I) CLUS3	(J) CLUS3	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
					Lower bound	Upper bound
1	2	.20543	.09721	.090	-.0242	.4351
	3	.58810[a]	.18849	.016	.1071	1.0691
2	1	-.20543	.09721	.090	-.4351	.0242
	3	.38266	.18469	.126	-.0920	.8573
3	1	-.58810[a]	.18849	.016	−1.0691	-.1071
	2	-.38266	.18469	.126	-.8573	.0920

[a] Mean difference is significant at the 0.05 level.

Table 6
Multicomparisons of firm size and external pressures to improve environmental practices.

(I) CLUS3	(J) CLUS3	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
1	2	.16600	.08448	.124	-.0337	.3657
	3	.51587[a]	.19521	.043	.0142	1.0175
2	1	-.16600	.08448	.124	-.3657	.0337
	3	.34987	.19022	.191	-.1439	.8437
3	1	-.51587[a]	.19521	.043	−1.0175	-.0142
	2	-.34987	.19022	.191	-.8437	.1439

[a] Mean difference is significant at the 0.05 level.

social practices was not found to be significant, which is contrary to the former research. It can be inferred, therefore, that the highest variability in firm size compared to the other effect sizes was explained by external pressures to improve environmental practices.

8. Discussion and conclusions

This paper presents the impacts and antecedents of sustainability for MNCs in China via a conceptual framework. This framework is part of a much broader attempt to assess the sustainability practices among MNCs in China. The primary aim of this study is to examine MNCs' sustainability in China. This research also examined the motivators for implementing sustainability and assessed the differences in sustainability performance based on firm size.

8.1. Implications for practice

The findings from the first stage of analysis highlighted the integral role played by parent companies to improve sustainability. Barriers to sustainability were found to be significant. They include environmental cost implications and a lack of knowledge and skills, which, when compared to other priorities such as management's lack of time, were not considered as important. It has been recognized that such barriers can impede efforts to change a firm's strategic decisions, as well as its routine operations (Post and Altma, 1994).

From a parent company perspective, leverage is needed in deciding how to handle barriers and enforce control within firms, via the strategic setting of targets and finding cost-effective ways to improve sustainability. Education pertaining to the importance of sustainability will also help to raise competencies. Previous research has shown that barriers to implementing sustainability practices in large firms often involve a lack of capital and expertise (Ammenberg and Hjelm, 2003; Simpson et al., 2004). Further, supporting this research, barriers to sustainability as reported by Collins et al. (2009) are cost, time and knowledge which appear to be common barriers among both SMEs and large firms.

This study also found that pressures from the parent company to improve sustainability positively affect external pressures from local governments, customers and competitors. The literature supports that most large firms feel pressure from external stakeholders (Lawrence et al., 2006). The literature is also supportive of, as a consequence of these increasing pressures from both external and internal stakeholders, MNC commitment, responsibility, and accountability in relation to sustainability practices have grown (Tan, 2009). Internal and external pressures are exerted from a number of groups for the adoption of green practices. Exports and sales to foreign enterprises have also initiated environmental improvements in China, with some firms demanding that certain standards be met (Christmann and Taylor, 2001). Some Chinese firms have improved their environmental awareness because of external pressures from government controls such as regulatory,

competitive and marketing pressures, which is supportive of the findings of this research.

Firms indicate they have implemented various green supply chain management practices to increase their environmental performance. Export trading in China has also improved its environmental quality standards to remain competitive in the global market (Zhu et al., 2005). Correspondingly, the barriers deterring SMEs from sustainable engagement differ, and the main problems are lack of awareness, financial resources, and external support. This research finds that government regulations are an important motivator for implementing sustainability, and barriers to adoption are found to influence cost management reduction. As a result, parent companies should create greater awareness of sustainability outcomes and encourage innovation in newer technology and practices that influence cost reduction. External support such as incentives from the government or other sources can also be sought.

Steger et al. (2003) found that, regardless of size, firms in China are image-driven. This is supported by Yu and Bell (2007) who also found that SMEs' corporate image is the most important driver for improving environmental and social practices, followed by governmental legislation. Since drivers for sustainability measures include enhancing reputation and brand, more publicity on how to incorporate social and sustainable responsibility is required. The implications for MNC small and medium enterprises in China are in successfully managing sustainability and encompassing sustainability in their core mission.

The second analysis showed that environmental practices had the most influence on several of the dependent variables, followed by internal pressure to improve social practices and barriers to adoption. However, involvement in social practices was not shown as an influencing factor for any of the dependent variables, but internal pressure to improve social practices was found to be significant. Involvement in social practices such as providing job training, assistance for employees to obtain tertiary education, gives time or money to local community projects, contributes to charity, considers diversity in hiring decisions, has family-friendly policies, provides flexi-time and has stress management initiatives. These are all critical for the welfare of employees and this is supportive of other research that showed very few SMEs report on their social practices compared with large firms. Yet, many small firms are beginning to view social practices as more of a priority (Lawrence et al., 2006).

Lawrence et al. (2006) also found that external pressures were not the motivating factor among all firm sizes. Marked differences in relation to the internal pressures did not appear to be felt by firms based on their size, with around 50% of small firms not exposed to any kind of internal pressures. In parallel, their research also found that differences based on firm size are less apparent for some of the socially-related activities (Lawrence et al., 2006).

On another note, discrepancies are often evident in how MNCs act in home countries, compared with host countries, where they are often held accountable for transparency and social responsibility (Tan, 2009). It has previously been recognized that China has a weak institutional environment with respect to ethical behavior, mainly due to its legal system and poor civic accountability (Snell and Tseng, 2003), making it easier for questionable social practices to occur. With increasing foreign investment in China, there is also an urgent need to increase the ethical performance of foreign investors and their role in social responsibilities (Shengtian et al., 2010).

The research identifies that sustainability in parent companies is not driving the sustainability trajectory when compared to their home country, in part because they are governed by the host country and because there may not be any direct control. There is also a failure to understand the need for ethical and social practices and this problem is likely to underpin the effectiveness of social responsibility. These issues remain contingent upon the motivations of top management governance of MNCs' firms in China. With regard to environmental sustainability, the adoption of accountability is further weakened due to the barriers imposed. Other researchers identify that sustainability in China is more likely used to reduce costs and also has a positive value for profits. In other words, there is a significant positive association between environmental sustainability and a SME's performance (Vijfvinkel et al., 2011). Thus, MNCs need to design a broader framework for ensuring that host countries take sustainability practices more seriously. Firms need to extend beyond merely adhering to regulations with the realization that profits are not necessarily compromised for sustainable development principles.

8.2. Implications for theory

A theoretical implication of the research findings of this study is that there is no direct control for managing sustainability within the present structures. Surroca et al.'s (2013) institutional theory to increase stakeholder pressure in MNCs is viewed as necessary. This research strongly supports regulation as a motivator for sustainability. Oliver's (1991) view on the agency approach, which suggests self-seeking behaviors in response to conforming to stakeholder expectation, ascertains this fact. Resource constraints, lack of awareness and management commitment are some of the other reasons for the poor uptake of sustainability issues by SMEs. This, together with the lack of strong external pressure, can lead to encouraging pollution havens and opens future research challenges to determine these contingent factors. In addition, one should not underestimate the importance of reputation and brand image these companies are seeking. Thus, even though MNCs may circumvent rising institutional pressures at home (Witt and Lewin, 2007), caution has to be exercised. As previously mentioned, the parent company has a significant obligation to implement sustainability initiatives. For policymakers in China interested in achieving sustainability goals, these results suggest that MNCs are adhering to the approaches laid down by government regulations. For a stronger response, more self-seeking behaviors towards improving sustainability within firms are required, rather than regulations requiring to be enforced and made more stringent.

In conclusion, empirical tests could be used to strengthen this study's conceptual framework. Future research may also seek to further investigate parent companies in relation to how they address sustainability issues in host countries. Further, the behavior of MNCs in China versus their respective parent organizations can be examined and used to support sustainability. Lastly, the results of this study should be considered with some caution when making generalizations due to the subjective nature of the participants. While subjective measures are often useful in reporting responses, a more objective measure would be considered more appropriate.

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Appendix A. Supplementary data

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