Firm Performance and Competitive Advantage: The role of Green Supply Chain Management Practices

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DOI: https://doi.org/10.15520/jbme.v7i08.2671

Abstract: This study assessed the role of Green Supply Chain Management practices in enhancing the performance and competitive advantage of firms. The study was based on 385 manufacturing firms. Various validity and reliability checks were conducted before the presentation of the actual analysis, which was conducted using Ordinary Least Squares approach, run using SPSS (v. 20). Findings revealed that, Green Procurement Practices, Green Manufacturing Practices, and Green Distribution Practices, had a significant effect on manufacturing firms’ performance and competitive advantage. Although Reverse Logistics had no significant effect on manufacturing firms’ performance, it had a significant effect on their competitive advantage.

Keywords: Green Supply Chain; Firm Performance; Competitive Advantage; Manufacturing.

INTRODUCTION

Continuous changes in the business landscape have brought about a new trend called the green revolution (Yawar and Seuring, 2017). This is all about giving credence and high consideration to green activities so that business activities will not result in deterioration or destruction of nature and the climatic order (Eltayeb et al., 2011). The steady increase in business activities over the years have resulted in alarming decline in natural order and beauty. Environmental activists have therefore taken strong stands in making sure that nature is not destroyed from the numerous business activities. Sustainability has thus become important part of that discussion for businesses and supply chain management practitioners, as stakeholders are becoming more concerned about the well-being of society, the environment and economic development (Golicic and Smith, 2013). As a result, the concept of green supply chain management (GSCM) (Srivastava, 2007), or environmental supply chain management (Govindan and Cheng, 2011), begin to gain prominence.

GSCM practices in the form of Green Procurement Practices (GPP), Green Manufacturing Practices (GMP), Green Distribution Practices (GDP) and Reverse Logistics (RL), were therefore seen as strategic tool that enhanced environmental performance (Mirhedayatian et al., 2014), and also seen as a unique resource and capability that enhance firm competitive advantage (Barney, 1991). Given that the practice of GSCM presents an avenue for the reduction of greenhouse gases emission and solid waste, the evaluation of GSCM practices is therefore relevant for companies (Côté et al., 2008). The ability of most firms to enjoy sustainable performance as a result of GSCM practices also depends on the firm's capacity to identify measures that ensure improvement in the management of firm supply chain practices leading to reduction in the usage of energy, water, material, and becoming more eco-efficient (Ortas et al., 2014).

Nevertheless, the effect of GSCM adoption on firm performance (economic, environment and operational) seems not to be clear and has become a challenge for managers to justify investment and implementation of GSCM (Zhu et al., 2012). Past studies on the relationship among GSCM practices, firm performance and competitive advantage, remained inconclusive (Eltayeb et al., 2011). Again, several studies attempted to assess the effect of GSCM practices on unidimensional performance indicators such as environmental performance (Çankaya and Sezen, 2019; Laari et al., 2016; Laari et al., 2016; Younis et al., 2016; Zhu et al., 2013; Eltayeb et al., 2011), economic performance (Çankaya and Sezen, 2019; Schmidt et al., 2017; Younis et al., 2016; Zhu et al., 2013; Zhu and Sarkis, 2004; Eltayeb et al., 2011) and social performance (Çankaya and Sezen, 2019; Younis et al., 2016), but most of these works did not attempt to assess the effect of GSCM practices on firm’s sustainable performance as a unidimensional construct by finding the combined performance effect of environmental and economic performance. This has presented a relevant research gap in developing countries in the sub-Saharan African region that require serious attention as most of these studies are conducted in the developed countries (Geng et al., 2017). Consideration the policy implication for the link between GSCM practices and firm performance, it is crucial for studies on GSCM practices-firm performance relationship to be conducted on a holistic approach, to capture the salient areas of operation. The current study therefore seeks to comprehend the extent to which the adoption of GSCM practices affect firm performance indicators.

The concept of GSCM according to Diabat et al. (2013) is still in its nascent stage in developing countries. This present
a great opportunity for firm in these countries to leverage on their green practices to differentiate themselves from the competition thereby enjoying competitive advantage. The concept of GSCM practices have been established by scholars as asignificant strategic initiative that help companies gain sustainable development (Cankaya and Sezen, 2019; Green et al., 2012; Rao and Holt, 2005; Sarkis et al., 2011). Hart (1995) also sees green practices as a source of unique resource, and if properly implemented could serve as a unique proposition for firms. It also positively affects firms’ sustainability performance through cost differentiation, product quality, and improvement in energy consumption. Competitive advantage is regarded as the implementation of strategies that create value but difficult for competitors to imitate and implement concurrently (Barney, 1991). Though studies (such as, Rao and Holt, 2005; Seuring and Muller, 2008; Wang and Sarkis, 2013; Yavar and Seuring, 2017) have examined the effect of environmental and social supply chain practices on competitive advantages, some found inconclusive results (for example, Vargas et al., 2018). This notwithstanding, research on the effect of GSCM on competitive advantage is limited in the sub-Saharan African region. This therefore create the need for the current study to assess the effect of GSCM on firm competitive advantage.

THEORETICAL AND LITERATURE REVIEW

Transaction Cost Economics (TCE):

TCE predicts that higher asset specificity will lead to increasing transaction costs and intensified monitoring activity and will drive firms to intensify relationships in an attempt to enhance control (Brockhaus, 2013). Because TCE focuses directly on transaction specific costs as they are incurred relative to the actual value of the transaction, the TCE lens can help to develop a broad and comprehensive assessment of the total costs that are associated with a sustainability initiative (Wang and Luo, 2010). Sustainability initiatives are often associated with investments that can be specific to the individual relationship. Consequently, these initiatives incur increased asset specificity which can facilitate stronger supply chain relationships (Plambeck et al., 2012).

Empirical findings support the notion that asset specificity of sustainability initiatives leads to both stronger relationship ties as well as increased performance of the initiative (Simpson et al., 2007). TCE generally divides transactions into market based or hierarchical when adding sustainability related issues to these kinds of supply chain relationships, the characteristics of the specific relationship are likely to change (Goldbach, 2002). Due to the more long-term focus and the inclusion of all three dimensions of sustainability, transaction costs of the relationship will generally rise. As pointed out earlier it is assumed here that sustainability Initiatives make relationships more complex and therefore incur higher costs for monitoring and control.

If viewed through a TCE lens, theory therefore predicts sustainability to foster closer relationships between companies as more Initiatives are implemented because companies attempt to reduce monitoring costs. Hence, from a practical point of view TCE suggests to potentially switch from a more market-based approach to the relationship to a more hierarchical form (Connelly et al., 2011, p. 88). This switch is designed to enhance the possibility to control more aspects of the relationship and lower information asymmetry and thus protect asset specific investments. Seuring (2011) contend that the implementation of GSCM is dependent on the development and performance of suppliers on a variety of standards. Seuring again admonished firms to be mindful of their monitoring cost else it will rise above the transaction costs that may end up being more than the value of the product supplied. He therefore suggests that stakeholders should adopt collaborative effort to sustain the sustainability performance of firms since the rising cost of GSCM implementation is inevitable.

Based on this general notion, literature on TCE suggests several mechanisms to tower the transaction costs that are associated with a sustainability initiative. Carter and Rogers (2008) for instance suggest that companies join Industry wide sustainability associations in order to reduce the costs for monitoring supplier’s sustainability performance. In other words, they suggest standardizing processes across multiple relationships to lower transaction costs. Goldbach (2002) advises that companies should look for suppliers with similar visions and expectations with respect to sustainability initiatives in order to reduce the monitoring costs. This however is likely to increase the searching costs for a supplier, of course also a form of transaction costs. IL is therefore important to carefully monitor transaction costs and deliberate which action is likely to reduce total transaction costs. Berger et al. (2007) suggest that sustainability initiatives can potentially increase the value of the transaction as prices for the products rise due to the initiatives. If this increase in the consumer's willingness to pay can be achieved with a relatively lower increase in transaction costs, these initiatives are profitable for companies despite increasing transaction costs. It is therefore important to always monitor the total cost and value of a transaction before deciding on the right way to structure a relationship. As this becomes more difficult when also assessing the TBL impact of a transaction, a correct assessment becomes even more important. The main problem of measuring sustainability is that the indicators are not performance oriented (Staniskis and Arbaciauskas, 2009). Most of the indicators measure the effort to be more sustainable; not necessarily the effect that is achieved. This creates a big problem in comparing any sustainability measures between companies because if the efficiency of a program is neglected (mostly not intentionally but simply due to missing data).

Another aspect is the lack of a life-cycle approach in the measurement of sustainability. Depending on the product and material, most energy use, pollution etc. take place either in the production phase or the consumption phase. Thus, the neglect of the entire life-cycle including the use of the product and also the disposal can produce misleading results in sustainability measurements (Staniskis and Arbaciauskas, 2009). This leads to the basic question, if the focus of the sustainability measurement should be the enterprise or the product. An enterprise can modify its products and processes in such a way, that substantial parts of the pollution and energy consumption are shifted from the
production to the consumption phase, thus achieving dramatic increase in performance measurement of sustainability on their part while the life-cycle bottom line of the product remains unchanged.

In summary TCE is an important theoretical foundation for supply chain sustainability initiatives because it can explain behaviour and therefore gives insights into how to design and structure an initiative in an efficient and effective way. TCE will therefore be employed to analyse the empirical findings of this dissertation.

**Green Supply Chain Management Practices (GSCM):**
As a result of the environmentally conscious nature of customers and other stakeholders, firms begin to respond to environmental legislations by instituting GSCM practices into its activities to ensure that the impact of their activities or operations on the environment has a minimal effect (Vachon and Klassen, 2006). According to Srivastava (2007), GSCM is defined as “integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life” (p. 54).

Though different conceptual frameworks were used to assess the GSCM practices-firm performance link, none of the GSCM frameworks has been universally accepted. The current study based on its objective, conceptualize GSCM practices based on four constructs; GPP, GMP, GDP, and RL of the work of Srivastava (2007) who stated that GSCM practices include green design, green purchasing, green production, green distribution logistics, marketing and reverse logistics. Below are the discussions of the four dimensions;

**Green procurement practices (GPP):** The decision to purchase is the first step in firm’s value chain process. Since the concept of GSCM practices came to the fore, firms begin to increasingly consider environmental factors before selecting their suppliers and ensure that suppliers meet the environmental management capabilities or specific environmental standard (Al-Sheyadi et al., 2019; Darnall, 2006). Green procurement according to Rao and Holt (2005) is the integration of environmental challenges and concerns into the firm’s procurement process. That’s is to say that for firm to be seen as successful in its green agenda, it is important for the firm to be seen aligning its environmental procurement efforts, activities and firm objectives together (Carter et al., 2000), making green procurement activities a significant component of GSCM. Hence, for firm to be seen as engaging in green procurement activities, the firm must first start with the selection of the right partners (suppliers) that the firm deals with. Selecting the right supplier does not automatically translate into the achievement of environmental criteria. It is important the purchasing firm ensures that the selected suppliers meet the sufficient environmental criterion of the firm (Al-Sheyadi et al., 2019; Çankaya and Sezen, 2019; Paulraj, 2011).

**Green manufacturing practices (GMP):** Green manufacturing is the system where firms ensure that their production processes do not affect the larger environment (Çankaya and Sezen, 2019). This requires firm to ensure that their production and planning activities utilize less energy and resources as possible resulting in minimal environmental pollution (Gao et al., 2009). The purpose of the green manufacturing is to ensure that the firm’s production process does not end up causing air, soil and water pollution (Çankaya and Sezen, 2019). Hence firms that engage in green manufacturing practices ensure that their products are environmentally friendly and accepted by environmentally conscious customers (Routroy, 2009).

**Green distribution practices (GDP):** Distribution is an important aspect of supply chain that ensures that the product moves from the manufacturer to the consumers. Green distribution practice is about issues relating to the reduction and elimination of environmental damages and wastes caused in the process of shipping the products from the producers to consumers (Çankaya and Sezen, 2019; Gao et al., 2009). This also has to do with the fuel the vehicle transporting products, the number of times and distances the product transported from the manufacturing to the consumers. The issue is that all these in the form green distribution practices contribute to the green performance of an organization (Sarkis, 2003).

**Reverse Logistics (RL):** Reverse logistics regarded as a crucial concept in supply chain is about the use of resources to minimize, recycle, substitute, reuse of materials and waste elimination. It is also said to aid in the reduction of the quantity of waste and enables waste recovery (Mesjazs-Lech et al., 2019; Safaei et al., 2017). Reverse logistic is again the process whereby organizations plan, implement and effectively control the efficient flow and warehousing of product which are to be recovered. Coelho and Mateus, (2017) also stated that reverse logistics is a sustainable management which ensures that organizations properly process and eliminate waste in a socially responsible manner. Hence, one can conclude that reverse logistics is a system that ensures that waste is manage in a way that helps in the protection of the environment.

**GSCM Practices and Firm Performance:**
For firms to better understand the issues of the environment, it is crucial for firms to recognize the sources of environmental challenges that are likely to confront them. The ultimate objective of GSCM is to ensure that firms’ activities have minimal effect on the environment. The achievement of these goals results in firms’ environmental performance where gains are made with regards to the effect of hazardous substances on the environment (Çankaya and Sezen, 2019). Firms in their quest to produce goods and services to satisfy their consumers must ensure that they do so in a manner that do not result in environmental pollution (Azapagic, 2003).

Firm performance which includes economic and environmental performance is associated with the firm’s ability to ensure that their production activities lead to consumption of less solid/liquid and hazardous substance and also minimize the cost related to the purchase of materials, consumption of energy, treatment and discharge of waste and fines associated with environmental accidents (Eltayeb et al., 2011; Zhu et al., 2008). Lee (2009) asserted that firms such as the small and medium enterprises must
ensure that their engagement in green practices result in the reduction of resources such as water, materials and waste in production. It is also stated that green practices leads to the reduction of waste caused by businesses leading to the enhancement of environmental performance (Azevedo et al., 2011). While some studies posit that green practices comes with a cost element to business (Hart and Ahuja, 1996) by stating that green practices do not enhance profitability and sales performance in the short run (Bowen et al., 2001) but rather increase cost of business thereby affecting business performance negatively (Min and Galle, 2001), others also assert that GSCM practices (GPP, GMP, GDP, and RL) positively affect businesses’ economic performance (Hart, 1995). Again, firms that engage in green practices are also said to enhance both their economic benefit and social goodwill such as enhanced corporate reputation and loyalty (Schmidt et al., 2017). Several studies have posited that green practices have a positive effect on businesses’ environmental performance (e.g. Al-Sheyadi et al., 2019; Famiyeh et al., 2018; Kung et al., 2012; Zhu and Sarkis, 2007; Shrivastava, 1995) and economic performance (Tang et al., 2012; Rao and Holt, 2005; Zhu and Sarkis, 2004; Carter et al., 2000). Therefore, the current study also suggests that firms that engage in green practices (GPP, GMP, GDP and RL) are likely to positively enhance firm performance. We therefore propose the following hypotheses:

**H1. GPP has a positive and significant effect on firm performance.**

**H2. GMP has a positive and significant effect on firm performance.**

**H3. GDP has a positive and significant effect on firm performance.**

**H4. RL has a positive and significant effect on firm performance.**

**GSCM and Competitive Advantages:**
According to Kurt Christensen (2010), “Competitive advantage is whatever value a business provides that motivates its customers (or end users) to purchase its products or services rather than those of its competitors that poses impediments to imitation by actual or potential direct competitors” (p. 21). From the resource based perspective, studies have stated that a firm’s competitive advantage is dependent on a good fit between the firm’s internal capabilities and dynamic environmental circumstances (Hofer and Schendel, 1978; Andrews, 1971). Firm’s ability to survive is said to be based on the firm’s capacity and capability to attain competitive advantage (Atuahene-Gima, 2005) through green practices that are difficult for competitors to imitate. Scholars have stated that firm can also derive their competitive advantage through the implementation of GSCM activities (Cambra-Fierro and Ruiz_Benitez, 2011; Chavan, 2005; Hart, 1995). That is to say that firms that are environmentally driven by engaging in GSCM practices (GPP, GMP, GDP and RL) enjoy competitive advantage in relation to cost or differentiation advantage over their competitors (Wagner et al., 2002).

Different terms such as environmental competitiveness (Wagner and Schaltegger, 2004), eco-friendly competitive advantage (Leonidou et al., 2015), green competitive advantage (Chen and Chang, 2013) and green-based competitive advantage (Arend, 2014) were attributed to the green type of competitive advantages (Vargas et al., 2018). While some studies found no relationship between GSCM practices and competitive advantage (Hazen et al., 2011; Zhu et al., 2005), others also found a positive and significant relationship between them (Famiyeh et al., 2018; Vargas et al., 2018; Chiou et al., 2011). Therefore, the current study suggests that firms that take advantage of environmental challenges by adopting measures that ensure that their procurement, manufacturing, distribution and reverse logistics follows environmental standard stand the chance of enjoying competitive environment. We therefore propose the following hypotheses:

**H5. GPP has a positive and significant effect on competitive advantage.**

**H6. GMP has a positive and significant effect on competitive advantage.**

**H7. GDP has a positive and significant effect on competitive advantage.**

**H8. RL has a positive and significant effect on competitive advantage.**
METHODS

Data Collection:
The study adopted structured questionnaire to collect data from 450 respondents from manufacturing firms within the greater Accra region of Ghana. Respondents from the procurement, supply chain, production and sales and distribution departments of these firms were selected. Purposive sampling was used to select respondents due to their in-depth knowledge and involvement in the execution and strategy formulation with regards to issues related to GSCM practices (Saunders et al., 2009).

The structured questionnaires were administered by qualified field assistants who were purposely trained for this project. Phone calls and walk in follow-ups were made to firms that had not responded after 4 weeks of receiving the questionnaires. After 8 weeks of data collection, 385 questionnaires were retrieved representing 95% response rate, which was deemed appropriate for data analysis.

Survey Questionnaire and Measures:
To ensure that issues of ambiguity concerning the questions were addressed during the data collection process, a number of steps were taken. Firstly, the questionnaires were developed based on extensive literature review. Secondly, the questionnaires were also pilot tested on 20 manufacturing firms. Questions that were not clear were rephrased for clearer understanding. The final questionnaire was administered to senior management members of the selected firms.

The observed items measuring GPP, GMP, GDP and RL were adapted from Chien and Shih (2007), Hoejmose et al. (2014) and Brockhaus et al. (2013). The items measuring environmental performance and financial performance were also adapted from Chien and Shih (2007) and Carton (2004). Finally, the observed items measuring competitive advantage were also adapted from Leitner and Güldenberg (2010) and Salavou (2015).

Some firm specific variables such as firm age, firm size (representing the number of employees), were controlled for in this study. Thus, firm size could significantly influence.

### Table 1. Demographic Features of Respondents

| Firms and Respondents’ Background | Frequency | Percentages (%) |
|----------------------------------|-----------|-----------------|
| Respondent                       | 385       | 100%            |
| Head of Procurement Department   | 122       | 31.69           |
| Head of Production Department    | 136       | 35.32           |
| Head of Sales and Distribution   | 127       | 32.99           |
| Size of firm                     | 385       | 100%            |
| 6-29 employees                   | 158       | 41.04           |
| 30-99 employees                  | 227       | 58.96           |
| Age of firm                      | 385       | 100%            |
| 5-10 years                       | 64        | 16.62           |
| 11-15 years                      | 120       | 31.17           |
| 15-20 years                      | 106       | 27.53           |
| 20+ years                        | 95        | 24.68           |
the GSCM practices in firms (Boso et al., 2013), and GSCM practices could be differently implemented based on the age of the firm (Wu et al., 2016), so they were controlled for.

**Validity and Reliability of the Instrument:**
To ensure validity and reliability of the measurement instrument, Confirmatory Factor Analysis (CFA) was performed in STATA (v.15). Factor loadings of the measures were all large than the 0.5 expected score (Table 2). As per the recommendations from past studies (such as, Kline, 2005; Brown, 2006; Hu and Bentler, 1999), Chi-square (χ²) is expected to be statistically insignificant, Chi-square divided by the degree of freedom (df) should be less than 3, RMSEA and SRMR are supposed to be less than 0.08 and TLC and CFI are also expected to be greater than 0.90. From the Table 2, all the fit-indices presented met their respective thresholds.

In order to ensure internal consistency of the observed items, Cronbach alpha was calculated for all the constructs, and results indicate that all construct have exceeded the threshold value of 0.7. Composite reliability value for each construct were also above 0.70. Average Variance Explained (AVE) was expected to measure convergent validity of the measurement items, and according to Fornell and Larker (1981), a minimum score of 0.5 meant that there was high convergent validity. From the analysis, all the constructs had their AVE above 0.5 indicating high convergent validity.

**Table 2. Confirmatory Factor Analysis**

| Observed, First-Order Latent & Second-Order Latent Variables | Factor Loadings |
|--------------------------------------------------------------|-----------------|
| &nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&n...
There is a strong brand positioning giving a competitive advantage 0.711
Our customers see us as superior to other producers 0.869

To ensure that there is discriminant validity as presented by Li et al. (2019) and Dogbe et al. (2019), the constructs were evaluated by comparing the square root of the AVEs (√AVEs) with the inter-correlation score. To achieve discriminant validity, the square root of the AVEs are supposed to be larger than the respective inter-correlation scores. Table 3 reveals that in all cases, the √AVEs were greater than their inter-correlations, meaning that there exists discriminant validity among the constructs studied. The issue of multicollinearity between any two constructs was also absent as the highest among the constructs was 0.482

Table 3. Discriminant Validity and Descriptive Analysis

|      | Mean | Std. Dev. | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
|------|------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| Size(1) | -    | -         |     |     |     |     |     |     |     |     |
| Age(2)  | -    | -         | .054*|     |     |     |     |     |     |     |
| GPP(3)  | 3.72 | 0.94      | .069*| 0.221**| 0.761|     |     |     |     |     |
| GMP(4)  | 3.37 | 0.98      | -.125| .318**| .438**| .737|     |     |     |     |
| GDP(5)  | 3.60 | 1.00      | .321| 0.224**| .163**| .365*| .726|     |     |     |
| RL(6)   | 3.66 | -0.95     | -.156*| .135**| .283**| .087**| .178**| .719|     |     |
| FP(7)   | 4.40 | 0.85      | .332| .394*| .348*| .186*| .435*| .212**| .809|     |
| CA(8)   | 4.25 | 0.70      | -.124*| .216*| .075**| .426**| .269*| .315*| .482**| .712|

** ~ P-value significant at 1% (0.01)
* ~ P-value significant at 5% (0.05)
√AVE are bold and underlined

RESULTS AND DISCUSSION

A multiple regression analysis was employed to examine the effect of GSCM practices on firm performance. The results revealed the following: the value of R-value was 0.810 indicated a strong positive correlation between GPP, GMP, GDP, and RL constructs and the firm performance (Table 4). The R-square of 0.656 revealed that the four dimensions of GSCM explained 65.6% of variations that occur in firm performance. The F-statistic of 21.02 with a p-value of 0.000 revealed statistically significant of the R-squared at 0.01%.

Table 4 again revealed that GPP (β = .544, P = .000), GMP (β = .416, P = .029), GDP (β = .492, P = .000) were all positive and had statistically significant effect on firm performance. These results resonate with other studies (Çankaya and Sezen, 2019; King and Lenox, 2001; Rao and Holt, 2005; Zhu et al., 2008; Azevedo et al., 2011; Green et al., 2012). These results tend to confirm the assertion that most firms tend to invest in green practices such as green procurement, green manufacturing and green distribution as most firms regard these practices as a legal obligation on their part (Beamon, 1999). However, reverse logistics practices had positive but statistically insignificant effect on firm performance (β = .254, P = .152). The current result resonates with other studies (e.g. Çankaya and Sezen, 2019; Vanalle et al., 2017; Eltayeb et al., 2011) by suggesting that reverse logistics still remain a novel concept in most developing countries as result of the massive investment it requires to be undertaken. Also the reverse logistics is difficult to implement in Ghana as a result of the customers and stakeholders’ lack of awareness about the concept.

The coefficient for green procurement practices was 0.544, which indicated that holding all other factors constant a 100% improvement in green procurement practices will result in 54.4% of firm performance and vice versa. From this study, green procurement practices were the most influential in determining firm performance. On the whole, the results indicated that green supply chain management practices contributed to improvement in firm’s performance (financial and environmental), as opposed to the assertion by Green et al. (2012), but agrees with other researchers (such as, King and Lenox, 2001; Rao and Holt, 2005; Zhu et al., 2008; Azevedo et al., 2011).
Table 4. Effect of Green Supply Chain Practices on Firm Performances

| Independent Variables | Coefficient | Std. Err. | t       | P-value |
|-----------------------|-------------|-----------|---------|---------|
| Intercept             | 1.728       | .409      | 4.220   | .000    |
| Age                   | -1.144      | .091      | -1.584  | .141    |
| Size                  | .236        | .115      | 2.042   | .043    |
| Green Procurement Practices | 5.44  | .109 | 4.901   | .000    |
| Green Manufacturing Practices | .416   | .184 | 2.260   | .029    |
| Green Distribution Practices | .492  | .110 | 4.492   | .000    |
| Reverse Logistics     | .254        | .174      | 1.456   | .152    |
| R-value               |             |           |         | 0.870   |
| R-squared             |             |           |         | 0.656   |
| F-statistics          |             |           |         | 21.020  |
| P-values              |             |           |         | 0.000   |

Results from Table 5 showed that the value of R-square was 0.464 indicated a weak but positive correlation between GPP, GMP, GDP, and RL constructs and the competitive advantage. The R-square of 0.215 revealed that the four dimensions of GSCM explained 21.5% of variations that occur in competitive advantage. The F-statistic of 3.017 with a p-value of 0.028 which revealed statistically significant of the R-squared at 5%.

In Table 5, the results revealed that firm age was negative but statistically insignificant effect on competitive advantage ($\beta = -.095, P = .136$). Also the size of the firm was also controlled for and the result showed that, firm size was positive and had statistically significant effect on competitive advantage ($\beta = .262, P = .000$) implying that bigger firms tend to enjoy competitive advantage from the practice of GSCM.

In Table 5, the results showed that GPP ($\beta = .244, P = .015$), GMP ($\beta = .439, P = .000$), GDP ($\beta = .155, P = .002$) and RL ($\beta = .281, P = .000$) were all positive and had statistically significant effect on competitive advantage of firms. This result is consistent with other studies (Rao and Holt, 2005; Barney, 2012; Jones and Riley, 1985). This result also assert that green supply chain management practices have become a unique resource and strategic goal for firms and firms that take advantage of these unique resources tend to set themselves apart from the competition (Potter, 1985; Barney, 1991). It therefore revealed that firms that engage in these green practices (GPP, GMP, GDP and RL) have the chance to enjoy competitive advantage.

The coefficient for green manufacturing practices was 0.439, which indicated that holding all other factors constant a 100% improvement in green manufacturing practices will result in 43.9% of competitive advantage and vice versa. From this study, green manufacturing practices were the most influential in determining competitive advantage followed by reverse logistics, green procurement practices and green distribution practices. Table 6 showed the supported and rejected hypotheses.

| Independent Variables | Coefficient | Std. Err. | t       | P-value |
|-----------------------|-------------|-----------|---------|---------|
| Intercept             | 3.530       | .362      | 9.738   | .000    |
| Age                   | -.095       | .066      | -1.439  | .136    |
| Size                  | .262        | .062      | 4.260   | .000    |
| GPP                   | .244        | .096      | 2.537   | .015    |
| GMP                   | .439        | .126      | 3.484   | .000    |
| GDP                   | .155        | .088      | 1.243   | .002    |
| RL                    | .281        | .062      | 4.492   | .000    |
| R-value               |             |           |         | 0.464   |
| R-squared             |             |           |         | 0.215   |
| F-statistics          |             |           |         | 3.017   |
| P-values              |             |           |         | 0.028   |

Table 6. Hypothesis Test of Survey Variables

| Hs        | Hypothesis                      | Path Coefficient | t-value | Hypothesis Support |
|-----------|---------------------------------|------------------|---------|--------------------|
| H1        | GPP → Firm Performance          | .444             | 7.768***| Supported          |
| H2        | GMP → Firm Performance          | .416             | 2.260** | Supported          |
| H3        | GDP → Firm Performance          | .492             | 4.492***| Supported          |
| H4        | RL → Firm Performance           | .254             | 1.456   | Rejected           |
| H5        | GPP → Competitive Advantage     | .244             | 2.537** | Supported          |
| H6        | GMP → Competitive Advantage     | .839             | 4.156   | Supported          |
| H7        | GDP → Competitive Advantage     | .155             | 3.243***| Supported          |
| H8        | RL → Competitive Advantage      | .281             | 4.492***| Supported          |

***p <0.01; **p <0.05

CONCLUSIONS

The main objective for this study is to assess the effect of GSCM on firm performance and competitive advantage. This study is crucial in our present society seeing the increase levels in consciousness within firms and stakeholders on the effect of GSCM practices on firm performances and its ability or otherwise in creating competitive advantage. The study concluded that except RL,
the other dimensions; GPP, GMP, GDP of GSCM were statistically significant at influencing the performance of manufacturing firms. Also all dimensions of the GSCM have also been found to have statistical significant effect on firm’s competitive advantage.

MANAGERIAL IMPLICATION

Due to the high cost involve in the implementation of the GSCM practices, Carter and Rogers (2008) for example suggest that companies join industry wide sustainability associations in order collaborate in the implementation of GSCM in order to reduce the costs of monitoring supplier’s sustainability performance. It is also suggested companies should look for suppliers with similar visions and expectations with respect to sustainability initiatives in order to reduce the costs. Hence the actions of exporting their products which meet ISO standards are commendable.

Whilees companies in Ghana are making the conscious effort to practice green supply chain management; others do not even know anything about this phenomenon, due to the lack of awareness and strong consumer association. Hence, companies that take advantage of this phenomenon to promote their green practices will certainly have the edge over their competitors. Also it is necessary for firms that are not practicing GSCM to start investing in green practices, to reduce stakeholder risk.

Presently, the logistics network of the economy hinges on fleet transportation, a few air transport, few ships, and limited rail systems. This leaves businesses with little choices to make in choosing effective and green distribution networks. The high patronage of fleet transportation comes with its increasing effect of carbon emissions and carnage; not to mention the loss and damage of products on the road. It is advisable to consider the revival and operation of the rail networks to link up the southern zones of the country to the northern zones, stretching into the land locked countries like Burkina Faso, Niger, Chad, and Mali who depend on the Ghana’s port for their link to the outside world. Aside this, the rail network will tend to reduce the rate of carnage and destruction of products. It will also serve as a green distribution network which uses little or no fossil fuel. Also the reverse logistic system should be flexible and know

Since RL was found not to have significant effect on firm performance, it important for the manufacturing companies to create the needed awareness of their reverse logistics system. One can suggest that lack of knowledge and facilities that enhance the efficient delivery of the unusable products were inexistence. Hence, we suggest that companies can enjoy higher performance leading competitive advantage, should they make serious investment that ensure that reusable facilities/products are made available to retailers or consumers.

SUGGESTION FOR FUTURE STUDIES

The study is limited in terms of generalization as the current study focused on manufacturing companies in Ghana. We believe that if these studies are carried out specifically on subsidiaries of multinational companies the result might be different. We therefore suggest that further studies should consider focusing on subsidiaries of multinational companies and other manufacturing sectors in Ghana.

The current study also relies on perception based metric data to analyse the effect of GSCM practices on firm performance and competitive advantage. Though steps are taken to address the challenges that characterized that kind of research, we suggest future research focus on performance based metric drawn from the annual reports.

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