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Green Logistics and Organisational Performance: Exploring Time-Based Competition as a Missing Link

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Abstract

The main objective of this study was to provide insight into how an organisation's decision to go green influences its performance in the logistics sector. This study advances a complex model by introducing time-based competition as a mediating variable between green logistics and organisational performance. The study considered a sample of 190 managers from logistics companies; thereafter, questionnaires were distributed. Data collected were analysed by employing the partial least square method of structural equation modelling. An analysis of the data indicates there are significant positive relationships between green logistics, organisational performance and time-based competition as well as between time-based competition and organisational performance. In addition, the intermediary role of time-based competition in the relationship is supported; thus, all hypotheses in this study were supported. These findings provide relevant information to managers and academicians in understanding the concept of green in the logistics sector, especially in this ever-changing and growing business environment.

Keywords: Green Logistics, Time-Based Competition, and Organisational Performance

Introduction

Over the years, concerns on the environmental damages, associated with accelerated industrial activities, have gained an international audience (Cetindamar, 2001). These increasing concerns have set in motion environmental regulations, which organisations are expected to undertake as socially responsible business practices. As a mechanism to address logistics activities centred on environmental awareness, there has been a research stream, green logistics management, which seeks to capture commitment when undertaking environment initiatives (Cheng et al., 2008; Robinson and Wilcox, 2008). Green logistics management is meant to enhance firms' environmental performance through cross-organisational support with business stakeholders and improve efficiency through cost-saving activities and farsighted risk management strategies (Hervani et al., 2005; Zhu and Sarkis, 2007). Reasons for this importance include global warming, government regulations, changing consumer and supplier demands, and the development of international certification standards (Hervani et al., 2005). Some research scholars and several literature reviews have characterised the current interest in environmental issues as 'small but expanding' (Rao and Holt, 2005; Zhu and Sarkis, 2007). Now, the critical question being asked by practitioners is if logistics activities influence environmental issues and mostly how to reduce negative environmental impacts (McKinnon, 2010). This emphasis is significant since it is common now to have merchandise to be manufactured on one side of the globe and distributed at its other side in just a few days because of very sophisticated and complex systems put in place to move goods from one point to another (Hummels, 2007; Dubey et al., 2015).

According to Murphy and Poist (2000), literature connotes that logisticians are best able to influence and manage environmental issues dealing with pollution (e.g., air, noise), the conservation of resources (e.g., energy conservation) and congestion. Environmental issues affect all aspects of logistic activities throughout the supply chain such as location, sourcing of raw materials, modal selection and transport planning, among others (Wu et al., 2012). Many logisticians in the academic setting and beyond seem to be concerned either about discovering ways to achieve environmentally sustainable logistics strategies or identifying and defining practices considered as most cost-effective for being proactive to environmental issues in logistics. Therefore, decisions regarding logistics at strategic, tactical and operational echelons of management will portend the environmental impact (Dubey et al., 2017). Businesses and logistic firms,

in particular, must develop green strategies to handle the challenges of going green as well as acquire the resources, skills and credentials to remain competitive in this new and evolving green environment (Menguc and Ozanne, 2005; Teixeira et al., 2016).

Organisational performance is influenced by the various activities undertaken by the organisation as wells as the external forces present in the environment. Government regulations and interventions are some of these external forces. Recently, logisticians need adapt to the evolving business environments (Zhu and Sarkis, 2004), particularly environmental regulatory requirements, if their services are to compete in regulated markets. Environmental regulatory pressure focuses on regulations that are established by indigenous or overseas regulatory institutions to manage environmental destructions emanating from organisational undertakings from production, transportation through to product disposal. In many instances, these environmental regulations are prerequisites to firms for production, distribution and selling of their products under the law. There are many such environmental regulatory pressures encountered by logistic organisations in their operations. The regulations directed at the logistic sector can bring operations and performance implications. Thus, there is a need to find the effect of these green requirements on the performance of organisations that are expected to obey these regulations. Several authors called for a set of ecological strategies that focus specifically on logistics both from the organisational management (Bowen et al., 2001; Carter and Dresner, 2001; Jabbour and de Sousa Jabbour, 2016) and from supply chain perspectives (Sheu et al., 2005; Zhu and Sarkis, 2004), where transportation forms a significant component. The measures captured here are aimed at prioritising shipment consolidation in planning and programming of flows, and at selecting less polluting modes of transportation, among others.

This initiative, however, comes with increased costs, which signifies to organisations that their competitiveness may be ended if they should fully integrate green policies into their decisions; however, despite all the awareness, many organisations remain persuaded that their competitive advantage would be decreased should they adopt environmentally friendly policies. Previous research connotes that proactive green strategy offers organisations competitive advantages because it allows the deployment of rare, unique and complex capabilities that help organisations become unique in comparison with competitors (Miles and Covin, 2000; Roslender and Hart, 2002). Porter and Krammer (2002) suggest that competitive advantage is driven by environmental performance resulting either from innovations or from adopting a strategic environmental management model. For instance, past studies emphasise that green product and green process innovations are positively related to the creation of competitive advantage (Moser, 2015; Sharma and Vredenburg, 1998). Furthermore, the proactive environmental strategy includes the implementation of strategic processes such as the research and development of green products and recycling systems (Moser, 2015). There is, therefore, the need to contribute to existing literature providing a link between green logistics and competitive advantage gained from time-based competition. Thus, it is logical to examine the effect of a firm's decision to go green on its performance.

Time-based competition is entirely new in the area of logistics, but has become a vital source of competitive advantage for most logistic organisations (Stalk, 1988). The ways in which leading organisations manage time in production, new product development and introduction, sales, and distribution represent the next powerful sources of competitive advantage. A logistics organisation's decision to become environmentally friendly signifies critical scrutiny of transport modes and selecting those modes that support such policies. For instance, a country where truck transportation (fuel-consuming trucks) is the paramount medium of goods transportation, a decision to go green means vital cost increase and delays in delivery time, which may be bad for time-based competition unlike in a country with several advanced modes of transport. Such a decision comes at a trade-off; either to incur more cost to maintain time-based competitive advantage or find other cheaper modes of transportation that are mostly slower and lose its competitive advantage. Moreover, the ability of an organisation to create and nurture a time-based competitive advantage has drawn much attention lately (Stalk, 1988). This study, therefore, seeks to find the relationship and effect of green logistics on organisational performance and the role of time-based competition in the specified relationship.

Literature Review

Green Logistics in the Service Sector

According to Raghuram and Jayaraman (2013), past researches mostly consider green practices in the manufacturing industry because many believe that the manufacturing sector mostly accounts for a more significant percentage in harming the environment. However, in this current world where the service sectors are growing at rapid rates, much research interest should

be channelled towards the effect of the interaction between the service sectors and the environment. The service sectors are conventionally thought to have less impact on the environment than the manufacturing sectors. However, most service sectors, which include the logistics industry, uses a vast number and amount of natural resources and thus produce a lot of contaminants, which needs to be addressed in the efforts to improve environmental management (Murphy and Poist, 2003; Sharma, 2013). Therefore, more work is needed to study environmental issues in the service sectors. To help understand the concept, this study highlights the incorporation of green practices in the logistics sector. The logistics industry strategically fills an essential position in every economy. Logistics companies provide logistics services for their customers, which include warehousing, transportation, inventory management, order processing and packaging. Practically, using environment-friendly raw materials in the production or recyclable parts in the process of remanufacturing effectively reduce harmful effects on the environment as well as also reduces manufacturing cost (Karpak et al., 2001).

Also, using environmentally friendly packaging materials, in combination with efficient packaging designs and methods, allow producers to decrease packaging waste and cost (Karpak et al., 2001; Bags, 2013). In transportation, grouping orders together and efficiently optimising delivery routes allow for a reduction in fuel consumption and distribution frequency (Rao et al., 1991). Again, using fuel-efficient vehicles or other efficient energy sources directly lessens greenhouse gas emissions (European Commission, 2001). Logistics considers three key elements, which are purchasing, packaging and transportation; thus, the above-mentioned green logistics practices will, to a significant extent, depict the state of green supply chain management in the industry.

Time-Based Competition

There is a large body of researches all seeking to exhort the importance of time-based competition and its relevance in the management field. Previous literatures recognise that time-based competition is quite new in the field of logistics but has become an important source of competitive advantage for most logistic organisations (Stalk, 1988). Organisations have been able to cut down their consumption time not only in production areas but also in their supply and logistic chains. Organisations with this efficiency and capability have transcended the known competitive advantage to have an advantage with respect to time. Time-based competition has been accepted as a competitive strategy, which focuses on time as the main and leading component in attaining and sustaining a competitive advantage. It aims to save the time used or needed in proposing, developing, producing, marketing and delivering products. The business world has seen constant changes over time, the presence of competition, technology and changing consumer needs will continually lead to development as long as it comes to competitive parameters.

Time-based competition was first proposed by George Stalk in 1988. Stalk (1988) explained how companies could achieve a competitive advantage by competing based on time to satisfy customer needs effectively and efficiently. Since that period, the focus on time as a key source for competitive advantage has been largely observed in the last decade of the 20th century and in the early 21st century (Azzone et al., 1991; Blackburn, 1990). These scholars admitted that time-based competition would allow a company to achieve competitive supremacy but there are some other scholars who hold the opposite view. According to the established convictions, 'doing things in a rush means bringing about defective production'; thus, when speed is the ultimate goal, time-based competition, as seen by some scholars, only increases costs and decreases quality. Thus, in conventional operations management, asserting that a firm succeeding in the establishment of time-based competition reduces costs and increases quality to some seems like a contradiction. However, an enormous body of work expresses contrary results; according to Schmenner (1988) and Lieberman et al. (1990), efforts exerted in shortening time, in fact, contribute to productivity increase and cost reduction.

In addition, research carried out by some scholars revealed that after implementing processes related to quicker response, organisations achieve the best or at least substantial quality improvement. In order to observe time-based competitive advantage, it is important to analyse processes pursued by manufacturers who consider speed as an obstacle (Sapkauskiene and Leitoniene, 2010). Traditional cost-based competition, with reactive response, time can only compete with time-based competitive strategies by using additional inventory thus creating an illusion of faster response. This increases costs and decreases profitability of organisations that are reactive to time and also explains why time-based competition is connected to higher growth rates and higher profit margins especially in the logistics industry. Blackburn et al. (1991, 1992) and Tammela et al. (2008), in their researches, gave supporting proofs that an organisation ensuring quicker delivery is able to decrease costs and expand market share. Time-based competition theory formally recognises the

strategic task of time. Time-based competition identifies the ways by which organisations manage time as a potent source of competitive advantage (Stalk, 1988). According to Abdinnour-Helm, (2000), Klimov and Merkuryev, (2008) and Banyte, (2009), the major idea of time-based competition revolves around time reduction during each stage of the general cycle, which means shortening the time of the following activities: planning, designing, product creation, innovation introduction, production, supply, marketing and distribution by considering consumer needs and expectations. Time-based competitors hasten the flow of information and products to be responsive and attract the most profitable customer segments (Hum and Sim 1996; Stalk, 1988).

Organisational Performance

Organisational performance is very important and has been researched on by scholars, especially across the domain of management research. Therefore, several scholars adopt discipline-specific measures in instances of deciding how to measure performance (Chenhall and Langfield-Smith, 2007). Due to this, organisational performance applications and measurements are constantly growing, encompassing quantitative and qualitative measurements techniques. Thus, it can be deduced that performance measures are dependent on the goals or objectives of an organisation or business. Organisational performance has become the main dependent variable for scholars researching in the area of management. As a result of changing business environments, that is, competition on the basis of customers, inputs and capital, it has become very essential for organisations to measure their performance so as to stay glued to their objectives and not deviate from attaining and sustaining a competitive edge.

As a consequence, measuring performance has attained a leading role in modern industrial activities. Marketing, operations, human resources and policies are all assessed based on their impact on organisational performance. Measuring performance is crucial in enabling practitioners in the situation of examining the detailed actions of organisations and managers, where organisations are always benchmarking with competitors. Performance is potent in its measuring capacity thus, its predominant use as a dependent variable. Although organisational performance has gained a lot of attention, its definition is still not consistent that is it still remains an open question with few researches and scholars using similar definitions as well as measures (Kirby, 2005).

According to Yamin et al. (1999), organisational performance includes analysing an organisation's performance with objectives and goals. In other words, organisational performance consists of real results or outputs analysed against intended outputs. This examining process focuses on the following three main outcomes: shareholder value performance, financial performance and market performance. In addition, Noyé (2002) highlighted performance as 'achieving the goals that were given to you in the convergence of enterprise orientations'. For Whooley (1996), performance is a socially created reality, which is resident in people's minds. Thus, it is not easy to measure it. Again, Lebas (1995) joined Whooley (1996) in asserting that performance is subjective and interpretative; thus, relating it to cost lines makes the concept ambiguous in nature. Despite the above positions on the concept, the perception of managing organisational performance is widely recognised and adopted all over the world. This grew rapidly from the private sectors and gradually found its ways into the public sectors in the developed world and currently making strides in many developing countries. As a result, governments, because of scholars advise, are issuing new legislation and initiatives to help focus on performance orientation.

Performance has been referred to as the outputs of work because it seeks to provide the strongest connection with top-level management goals of an organisation, customer satisfaction and economic contributions. Several research scholars recognise performance as a dependent variable and try to figure out variables that produce changes in performance. In this study, organisational performance serves as a dependent variable, which is consistent with existing literature. Past research proves that performance measurement techniques may be peculiar to each organisation, or branch of an organisation, reflecting its fundamental goals and its environment. According to Hervani et al. (2005), extant literatures have studied the general principles of performance measurement. Organisational performance, in this study, is considered from two perspectives: market performance and financial performance. A large body of researches captures organisational performance using financial and market criteria. These criteria include return on investment (ROI), market share, profit margin on sales, the growth of ROI, the growth of sales, the growth of market share and overall competitive position (Holmberg, 2000). In line with the above literature, the same items were adopted to measure organisational performance in this study.

Empirical Review

The Link Between Green Logistics and Organisational Performance

The current emphasis has been on the environment when it comes to logistics and manufacturing. This is because of the harm caused to the environment in the course of business operation. Various governments thus have imposed regulations on business activities to reduce these negative impacts on the environment (Judge and Douglas, 1998). According to Hart (1995), the seminal natural resource-based view of the firm (NRBV) suggests that organisations must imbibe environmental considerations into their strategic planning. He further highlighted that such adoption will increase the ability of organisations to deal with uncertainties at the business environment interface, and consequently lead to higher corporate performance. Other scholars who conducted investigations in have supported Hart's (1995) views (Sharma and Vredenburg, 1998). However, some scholars are of the opinion that an organisations choice to go green will negatively influence its performance due to the huge investments involved in these practices (Walley and Whitehead, 1994).

In addition, for an organisation to incorporate strategies that are environmentally friendly, it will need the utilization of technology and human capital that are rare to attain a competitive power over competitors, thus the view that going green requires a huge investment (Jabbour, and de Sousa Jabbour, 2016). In the discipline of logistics, an organisation's choice to be green means reduced travel times, low carbon emissions, recyclable products, just in time systems to help effectively and efficiently manage inventory, etc. Although all these practices come with costs the key question is can the outcome offset the initial investment both in the short run or in the long run. Generally, scholars that agree with the NRBV believe that higher performance is linked to firms' reduced legal threats linked with environmental issues (Bansal and Roth, 2000), improved firm reputation and an enhanced capacity to serve environmentally conscious stakeholders as well as other advantages associated with continuous innovations (Porter and Krammer, 2002). Due to the reason that public concerns about the environment are growing faster than most national problems, a strong environmental reputation can be a source of market advantages (Russo and Fouts, 1997) even among small and medium-sized enterprises (Aragón-Correa et al., 2008). Most researches conducted by scholars agree that organisations that have developed a reputation for negative environmental activities either will be hurt in the marketplace or will have to spend inordinate resources to counter the negative reputation (Parguel et al., 2009; Porter & Kramer, 2002). Therefore, proposing the first hypothesis:

H1: Green logistics has a significant positive effect on organisational performance.

The Link Between Green Logistics and Time-Based Competition

Current researches on time-based competition coincide with an increasing emphasis on time in business operations. A survey conducted on American organisations showed that those organisations put time-based competition first when it comes to their policies and priorities. Their reason was that speed aided them in being ahead of their competition cold (Blackburn, 1991). Through adapting time-based competition strategies, organisations' are able to boost production speed as well as increased market shares. Time-based competition is a managerial approach, which focuses on shrinking the time required for businesses to complete key activities. According to Stalk and Hout (1990), 'time is the secret weapon of business because advantages in response time lever up all differences that are basic to overall competitive advantage'. Time-based competition has been tagged the next source of competitive advantage, the 'next competitive battleground' by Porter and Krammer (2002). Due to government pressure, it is difficult for an organisation to operate without considering green practices. Now, the key question is does the decision to adopt green practices affects a firm's time-based competitive strategy? According to past research (Rao et al., 2005) in logistics and operations research, firms become environmentally friendly to decrease risks and increase the competitive influence of the organisation.

Some scholars claim that by incorporating green practices in the logistics systems, organisations will accrue both efficiency and other long-term benefits such as increased market shares and higher profit margins (Rao et al., 2005). Within the supply chain, transportation is the largest source of environmental impact (Wu and Dunn, 1995) and on an aggregate level, freight emissions account for roughly 8 per cent of worldwide energy-related CO_2 emissions (McKinnon, 2010). Although, a significant number of researches exists on achieving simultaneous improvement in environmental as well as economic performance in a logistics context (Carter and Rogers, 2008; McKinnon, 2010), little of these researches have in-depth examination of whether greening measures in a logistics scenario have actually led to significant number of changes in the performance of the logistics systems whether environmentally or economically. However,

previous studies connote that greening in the logistics sense considers shortening travel times as well as reducing carbon emissions. Fast manufacturers can make and ship an order the day they are received due to the manufacturer's ability to green their production cycles, thereby eliminating harmful business processes hence reducing the time it takes to produce. Thus, it can be deduced that shorter travel times and shorter production cycles mean faster delivery, which also means that customers get goods as and when needed and on time, hence the second hypothesis;

H2: Green logistics has a significant positive effect on time-based competition.

The Relationship Between Time-Based Competition and Organisational Performance

Since the 21st century, the concept of time-based competition has gained attention from both practitioners and academicians. Despite the focus on the topic, limited empirical studies have been undertaken looking at the relationship between time-based competitive strategy and organisational performance (Narasimhan and Jayaram, 1998). According to Droge et al. (2004), delivery performance factor, which consisted of volume flexibility, delivery speed and delivery dependability, was found to be related to an organisation's financial growth. In this ever-changing business environment in terms of competition, technological advancement and changing customer needs, it has become essential that organisations find and maintain a competitive edge to thrive in the environment. Thus, firms are now shifting focus from the general sources of competitive advantage (price, quality and delivery) to time-based competition (Stalk, 1988). According to Stalk (1988), fierce competition has been the motivation for competitors to introduce new products and ever-greater variety at rapid rates. For an organisation to adopt a time-based competitive strategy, the focus should be on customer responsiveness and rapid new product introduction, coupled with competitive quality and cost (Hum and Sim, 1996). According to Hum and Sim (1996), significant literature supports that a competitive strategy that increases responsiveness to customer needs to lead to competitive advantage. Thus, the essence of time-based competition captures reducing time in every stage of product creation and delivery cycle. This translates into a significant source of competitive advantage.

Increasingly, only time-based competitors will have the ability to dominate their industries. This is because customers have become very sensitive to the degree of responsiveness provided by businesses in both the manufacturing and the service sectors. Stalk and Hout (1990), in their book: *Competing Against Time: How Time-Based Competition Is Reshaping Global*, emphasised that by being proactive with time, organisations increased their productivity and also obtained favour from customers, as a result achieving higher market share. By accepting the principles of time-based competition, organisations were able to decrease complexity, rework and improved transparency, allowing them to balance the trade-off assumed between cost and quality. Therefore, many scholars agree that time-based competitive strategy enormously affects business thinking and decisions, with several organisations embracing it across economic sectors to streamline and boost their operations. Hence, the third hypothesis, which states:

H3a: Time-based competition has a significant positive effect on organisational performance and

H3b: Time-based competition plays a mediating role between green logistics and organisational performance.

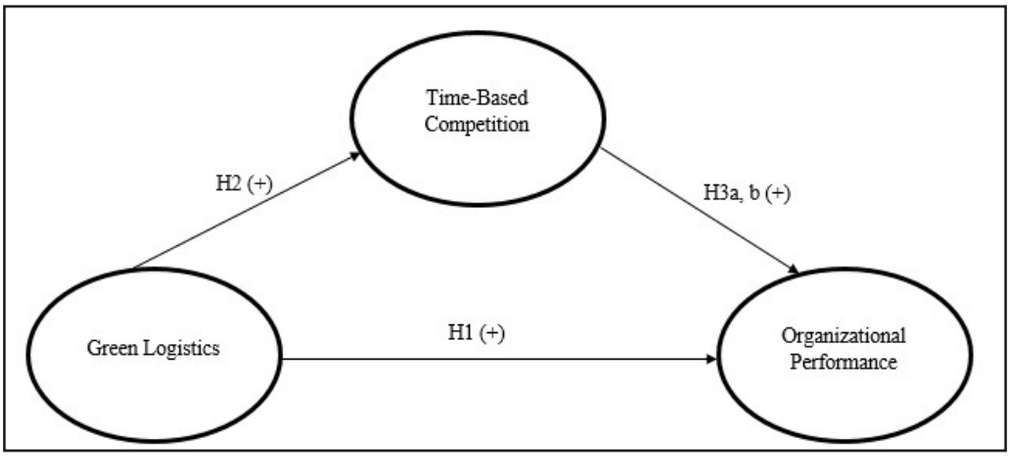


Fig. 1: Empirical Model

Methodology

According to Zikmund (2000), the objective of quantitative research is to determine the relationship between one variable (independent variable) and another (dependent variable) in a population. Thus, the quantitative approach was adopted in analysing data and making interpretations. The population for the study consisted mostly of management of logistics organisations operational in Ghana. A sample size of 190 organisations was selected and questionnaires were administered to logistics managers in these respective organisations (Krejcie and Morgan, 1970). Simple random sampling technique was chosen because it provided an opportunity for each of the organisations in the total population to have an equal chance of selection. The questionnaire contains five questions for green logistics, five questions for evaluating the time-based competition and five questions for capturing organisational performance. The Partial Least Squares path modelling technique using SmartPLS software was selected in this research study mainly due to its ability to deal with normality violations; thus, it does not require the hard assumption of the distributional properties of raw data.

In addition, PLS handles both reflective and formative indicators. PLS insures against improper solutions by the removal of factor indeterminacy; this technique is robust in dealing with data noise and missing data as well as applies many parameters in a complex model with normal residual distributions; it also handles collinearity in the independent latent variables and has more statistical power than a maximum-likelihood covariance-based SEM method. It is a good prediction-oriented technique in maximising the variance explained in the latent variables and allows simultaneous modelling of the relations among latent variables; PLS combines regression and factor analysis within the measurement model in each run and PLS is more advantageous in case of new and refined measures (Peng and Lai, 2012; Henseler et al., 2015; Rigdon, 2016).

Results/Findings

Construct Reliability and Validity

To ensure that the measures used for the various constructs are reliable, the researcher calculated composite reliabilities and reported them. Hair et al. (2015) recommended that, in determining the significance and relative importance of the factor loading used model, individual items with factor loadings of 0.7 and above are significant and, hence, should be included in the final measurement model. The threshold value for composite reliability is 0.6 (Bagozzi and Yi, 1988); and 0.5 for average variance extracted (Rodgers and Pavlou, 2003). Rodgers and Pavlou (2003) suggested items which have low values should be removed and the model trimmed since trimming of the original measurement model improves the AVE and strengthens direct paths between the constructs as well as the entire model. Table 1 captures the adequacy of the indicators measuring the variables in the study and from the assessment; the composite reliability was above the minimum threshold of 0.6 as recommended by Bagozzi and Yi, (1988).

Table 1:Construct Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Green Logistics	0.799	0.872	0.635
Organisational Performance	0.852	0.910	0.771
Time-based Competition	0.720	0.842	0.640

Source: Field data (processed with SmartPLS)

From Table 1, the Cronbach's Alpha of the constructs was within the range of 0.720-0.852, which are clearly above the threshold of 0.70 proposed by Henseler et al. (2009). The composite reliabilities were also within an acceptable range of 0.842-0.910 well above the recommended threshold of 0.6 (Bagozzi and Yi, 1988). The AVE measures convergent validity and is recommended to be above 0.50 (Rodgers and Pavlou, 2003). From the above table, the AVEs were within the range of 0.635-0.771 well above the recommended threshold of 0.50. Thus, the constructs achieved convergent validity.

Discriminant Validity

To ensure there is discriminant validity, all of the square roots of the AVE measures should be greater than the correlations of the latent variables in the model (Hair et al., 2013; Henseler et al., 2017). Table 2 indicates that the model has discriminant validity since all the square roots of the AVEs are larger than the correlations of the latent variables in the model.

Table 2: Fornell-Larcker Criterion

Construct	Green Logistics	Organisational Performance	Time-Based Competition
Green Logistics	0.797		
Organisational Performance	0.506	0.878	
Time-based Competition	0.670	0.572	0.800

Source: Field data (processed with SmartPLS)

In addition, Table 3 shows that HTMT ratios of the multi-item constructs used in the model were well below the threshold value of 0.850 except for the relationship between green logistics and time-based competition which was slightly above the threshold with 0.855 (Henseler et al., 2015). Although it was above, this slight difference is considered normal and should not affect the discriminant validity of the model since the AVEs and Fornell-Lacker criteria were all in the acceptable range (Henseler et al., 2015).

Table 3: Heterotrait-Monotrait Ratio (HTMT)

Construct	Green Logistics	Organisational Performance	Time-Based Competition
Green Logistics			
Organisational Performance	0.604		
Time-based Competition	0.855	0.723	

Source: Field data (processed with SmartPLS)

Table 4 shows the cross loadings which indicates that each indicator used in the model loads higher on its construct than how it loads on all other constructs in the model. Thus, it shows the model has discriminant validity.

Table 4: Cross Loadings

Indicator	Green Logistics	Organisational Performance	Time-Based Competition
GL1	**0.838**	0.385	0.446
GL2	**0.849**	0.371	0.512
GL3	**0.876**	0.368	0.559
GL4	**0.593**	0.452	0.565
OP1	0.432	**0.883**	0.489
OP2	0.417	**0.876**	0.501
OP3	0.482	**0.876**	0.517
TCA1	0.416	0.384	**0.739**
TCA2	0.594	0.459	**0.801**
TCA3	0.575	0.518	**0.856**

Source: Field data (processed with SmartPLS)

Structural Model Results

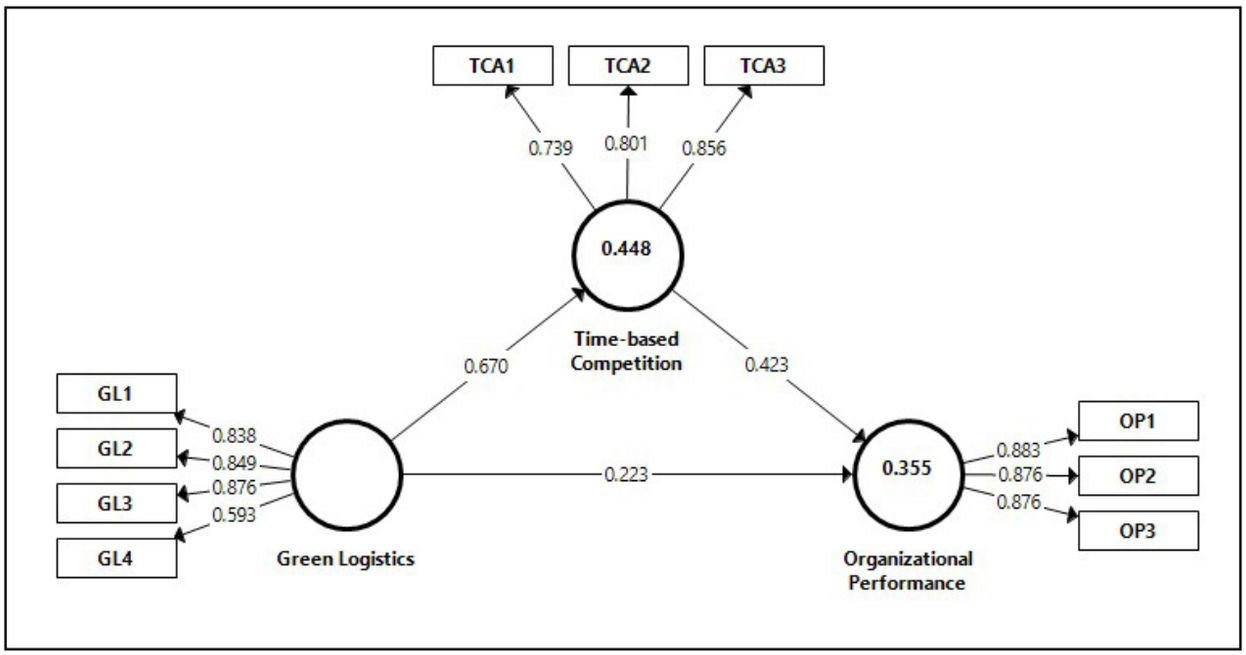
Table 5 and Fig. 2 present the results of the R^2 values as well as the path significance in the structural model. It shows that organisational performance and time-based competition have R^2 values of 0.355 and 0.448, respectively. Additionally, Table 5 also indicates the Adjusted R^2 values, which are 0.348 and 0.445, respectively. The above R^2 shows that green logistics explains 0.448 of the variance of time-based competition. The constructs green logistics and time-based competition together predicts and explains 0.355 of the variance of organisational performance, which in this study is the dependent variable.

Table 5: Organisational Performance Time-Based Competition

R Square	Adjusted R Square
0.355	0.348
0.448	0.445

Path	Beta Coefficient	Standard Deviation	T Statistics	P Values	Hypothesis Testing
Green Logistics -> Organisational Performance	0.223	0.069	3.250	0.001	H1: Supported
Green Logistics -> Time-based Competition	0.670	0.040	16.824	0.000	H2: Supported
Time-based Competition -> Organisational Performance	0.423	0.064	6.586	0.000	H3a: Supported

Source: Field data (processed with SmartPLS)



Source: Field data (processed with SmartPLS)

Fig. 2: Structural Model

From Table 5, it can be concluded that the hypothesised relationships were all supported. This means that for hypothesis 1, an organisation that adopt green or environmental concepts into business operations, will have a significant effect on their performance as opposed to firms that do not engage in such activities (β = 0.223, p = 0.001; Table 5, Fig. 2). Hypothesis 2, the data analysed indicated that logistics organisations that engage in activities that enhance green concept strategies will be able if not in the short-run, will eventually develop a time-based competitive advantage in the long-run (β = 0.670, p = 0.000; Table 5, Fig. 2). Analysis of data indicated that for hypothesis 3a, organisations that are able to effectively compete on the basis of time, will see a significant effect on performance which will eventually result in a time-based competitive advantage (β = 0.423, p = 0.000; Table 5, Fig. 2). Finally, for hypothesis 3b which focuses on the mediation of time-based competition between the green logistics and organisational performance relationship, scrutiny of the data connotes that time-based competition mediated the relationship thus play a vital role between the relationship as shown in Table 6 (β = 0.283, p = 0.000; Table 6, Fig. 2). Since the direct and indirect effects are both significant and have their Betas' moving in the same direction, we can say there is what is known as complementary mediation.

Table 6: Mediation (Indirect Effect)

Path	Beta Coefficient	Standard Deviation	T Statistics	P Values	Hypothesis Testing
Green Logistics -> Time-based Competition -> Organisational Performance	0.283	0.048	5.962	0.000	H3b: Supported

Source: Field data (processed with SmartPLS)

Conclusion and Implications

This study indicated that logistic companies or firms that adopt green or environmental concepts into business operations would have a significant effect on their performance as opposed to firms that do not engage in such activities. Also, logistic companies or organisations can gain a competitive advantage with specific regard to price, quality, delivery and flexibility should those logistics organisations adopt green strategies. Organisations that engage in activities that enhance green concept strategies will be able if not in the short-run, will eventually develop a time-based competitive advantage in the end. Thus, it can be ascertained that green logistics lead to a competitive advantage (time-based) and improved performance. Competitive advantage relies on an organisation's capability to attract customers and enhance good reputation for the organisation or its products and increase customer's perceived value, thus achieving customer satisfaction. This being highlighted, an organisation that possesses a competitive advantage will enjoy improved performance either in market share or in financial growth. Therefore, it can be concluded that any organisation that possesses a competitive advantage will see or witness a significant effect on performance. Thus, this study supports the view that understanding the concept of green strategies in an organisation is essential for the adequate running of a business in this current complex business environment.

Based on the above findings and conclusions, being environmentally friendly as an organisation is very important for smooth business operations. Regardless of the nature of business operation or objectives, there is always a room for strengthening and improving green strategies in the organisation. It is further recommended that to achieve environmental friendliness; there should be continuous evaluation and reflection on green policies and strategies currently in use. In addition, management should pay rapt attention to suggestions forwarded by stakeholders so as right decisions can be arrived at in the interest of all stakeholders. Supervising and evaluating green policies currently under implementation is very vital due to its ability to save money or reduce costs in the long term because promoting more traditional, less environmental friendly practices cost some money upfront. Finally, consumers now recognise green companies due to the easy access to information in this technological age that is consumers have learned to some extent how to evaluate how green a company is on their own. Thus, an organisation can lose its customers if there are fewer considerations for the environment in business operations.

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