

Visualizing Environmental Performance and Financial Performance: An Analysis of Firms in the US Food and Beverage Supply Chain

Dipendra Singh, PhD
Assistant Professor,
Rosen College of Hospitality Management,
University of Central Florida,
Orlando, United States.

Dr. Leonard A Jackson
Cecil B. Day. School of H.A
J. Mack. Robinson College of Business
Atlanta, Georgia, USA

Abstract

This research examined the simultaneous environmental-financial performance of firms in the US food and beverage supply chain. Results suggests that firms with higher environmental scores performed better financially than those ranked lower, suggesting that firms in the food and beverage supply chain can excel simultaneously on both environmental and financial initiatives. Findings also suggested that regarding simultaneous sustainability-financial performance, food and beverage suppliers can be classified into four distinct categories: *progressive firms* or those that excel on green initiatives and perform well financially in a balanced manner; *repressive firms* or those that perform poorly on both dimensions; *aggressive firms*, or those that perform admirably financially but poorly on environmental initiatives and; *green firms*, or those that perform admirably on green initiatives but poorly financially.

Keywords: Green practices, suppliers, hospitality industry, multidimensional scaling

Introduction

Academic and corporate awareness of green, environmental or sustainable practices in the hospitality industry has increased in recent years. In fact, adoption and implementation of environmental initiatives have become an integral strategic component and central tenet of several hospitality organizations. Factors motivating firms to embrace this burgeoning trend include: organizational values, whereby firms and their leaders seek to embrace the green concept and provide leadership in this area (Maignan, Hillebrand, & McAlister, 2002); reactive adoptions to assuage threats to transaction costs, brand, and competitive repositioning (Spar & Mure, 2003); the ability to leverage marketing, publicity, and innovation (Maignan et al., 2002) and; globalization, regulation and sustainable development (Panapanaan, 2003). In essence, green practice adoptions have been driven largely by societal and competitive pressures in conjunction with changing consumer demand.

Existing hospitality research addressing the green hospitality supply chain has focused on application of green practices along the supply chain in various sectors including: the restaurant sector (Wang, Chen, Lee, & Tsai, 2013; Namkung & Jang, 2013); cruise line sector (Veronneau & Roy, 2009) and; travel sector (Schwartz, Tapper, & Font, 2008). Largely ignored are suppliers to the industry despite the fact that it has been argued that one of the challenges faced by green practicing hospitality firms is the inadequacy and inconsistency of green products from suppliers (Kasim & Ismail, 2012). Relatedly, firms adopting environmentally responsible practices face risks of public criticism of engaging in green washing if their supply chain is not perceived as adhering to sustainable or green principles. Consequently, firms within the industry are becoming more diligent in ensuring that entities within their supply chain are actively engaged in green practices. Furthermore, beyond the unethical practice of engaging in green washing, stakeholder criticism of actual or perceived green practice deficiencies can prove to be detrimental for firms in regards to their profitability, market share and the infusion of supply chain accountability into green practices. In addition, it is difficult or impossible for hospitality firms to advertise or boast green claims if components or elements within their supply chain do not adhere to generally accepted green or sustainable principles. Hence, food and beverage retailers such as restaurants and hotels that claim to be green or adhere to the principles of green practices are required to not only offer products and services that are environmentally friendly to

consumers, but also actively ensure responsible green or environmental practices along their supply chain. As such, green practicing firms are increasingly encouraged to conduct business with green suppliers who adhere to the principles of environmentally responsible logistics (ERL), or simply, green logistics. This is especially the case for food and beverage and related firms since the production of food and beverage items generates negative externalities that impact the environment.

Hospitality studies attempting to assess firms' environmental and financial performance have generally attempted to ascertain the bi-directional relationship between both issues. These studies have typically utilized stock market or accounting data in conjunction with retrospective quantitative environmental Data to ascertain this relationship. Hence, such studies have sought to ascertain whether or not firms' market or financial performance is correlated with environmental performance. Missing from the body of existing research are studies that attempt to ascertain the relationship between hospitality food and beverage supply firms level of environmental performance as indicated by their green rankings or green scores and their financial performance. Given the importance of the food and beverage industry to the hospitality and tourism industry as a whole, combined with the maturing subject of corporate adoption of environmental initiatives, there is need for research to provide a clear understanding of this relationship along the food and beverage supply chain. Furthermore, given the growing importance of ERL, it is imperative that studies are conducted to examine the financial-sustainability performance of firms along the food and beverage supply chain. This is especially important given the food and beverage industry's exposure to risk of criticism if their green initiatives are not all-encompassing and include all components along the supply chain. In addition, it is important that such studies are conducted given the nascent stakeholder interest in voluntary non-financial disclosures (such as firms' performance on environmental initiatives). Hence, given the growing importance of both financial and non-financial disclosures in the decision making processes of stakeholders, it is important that firms' performance on both constructs are assessed and presented in a manner that can be easily understood and interpreted by prudent stakeholders.

Literature Review

Green supply chain management and the US food and beverage supply chain

The food and beverage segment is one of the most visible, complex and important sectors in the hospitality and tourism industry as well as an important economic sector in the US economy, representing in excess of 12% of the US gross domestic product (Stock, 2004). The complexity of the US food and beverage industry is highlighted by the fact that its supply chain comprises thousands of companies working to deliver food and beverage products to the end consumer (Stock, 2004). In addition, the industry impacts the environment upstream through farming and production, energy usage and generates downstream through waste disposal. For food, the product typically originates from growers who sell to processors either directly or through brokers. Growers also have the ability to reach directly further down the chain to distributors, retailers (such as restaurants) and sometimes consumers. In addition, food and beverage manufacturers and processors typically sell to distributors, wholesalers and brokers although the larger processors and manufacturers can, and typically reach retailers and consumers directly. In essence, the supply chain path of food and beverage products depends on the type of food and beverage product as well as the market power and size of the supply chain members (Maloni & Brown, 2006).

It is essential that hospitality firms adhering to the principles of green or environmental management pay close attention to the green practices of their food and beverage suppliers since the production of food and beverage products creates negative externalities which impacts the environment. For example, Fox (1997) suggested that problems associated with manure disposal soil and water degradation, deforestation and global warming from methane are examples of such externalities. These arguments were accentuated by Boehlje, (1993), who also noted that agricultural chemical usage such as fertilizers, herbicides and pesticides, as well as farming techniques also lead to conditions that are not conducive to the principles green practices. Other non- green factors associated with the production of food and beverage products include water pollution, packaging as well as food and beverage miles or the distance traveled from the place of production to place of consumption (Eastman, Sharples, & Ball, 2001).

Green adoption and Financial Performance

Adoption of environmental or green initiatives by tourism firms remains nascent and has increased exponentially since the 1990's (Nicholls & Kang, 2012). In general, the industry as a

whole has generally focused on environmental initiatives that minimize effluents, and consequently overall negative environmental impacts (Myung, McClaren, & Li, 2012; Rubinet & Giannelloni, 2010). The increase in adoptions of green initiatives has taken place despite the fact that firms' environmental initiatives are often dismissed by some stakeholder groups as public relations or publicity stunts (McPeak & Tooley, 2008). Further, firms are often skittish about investing in such initiatives since there is discord regarding the relationship between environmental efforts and financial performance (Clarkson et al., 2011). Despite such trepidations, tourism firms continue to invest in environmental initiatives to obtain actual or ostensible benefits and advantages. These include: attainment of competitive advantages and cost savings gained through efficiency derived from usage of less costly materials and processes; savings obtained from conversion or recycling of waste into valuable and useful forms and; savings derived from implementation of energy efficiency techniques and waste management techniques (Porter & Van der Linde, 1995). Other benefits driving adoption in the industry include: increased employee loyalty; increased customer satisfaction and retention; improvement in firms' ability to comply with, or circumvent governmental regulations and reinforcement of a positive image (Lynes & Dredge, 2006); minimization of exposure to risks (Graci & Dodd, 2008) and; business protection (Bohdanowicz, Zientara, & Novotna, 2011; Bohdanowicz, 2005). It is also suggested that adoption of green initiatives by firms generate "green goodwill" (Dhaliwal, Li, Tsang, & Yang, 2011) or reputational enhancement. In addition, from a resource allocation perspective, researchers have argued that adoptions of such initiatives and practices are congruent with efficient production since poor environmental practices represent inefficiency and wastage of resource inputs. Hence, green practices enhance innovations that result in more efficient operations, product differentiation and profitability (Nehrt, 1996; Porter & Van der Linde, 1995; Reinhardt, 1998).

Relationship between green initiatives and financial performance

Over the past three decades, academic literature is replete with empirical studies designed to examine the association between firms' environmental initiatives and financial performance. Evidence from these studies have either strongly supported association between firm's environmental initiatives and financial performance or have found no such definitive linkages (Jones & Ratnatunga, 2012). Such findings were highlighted in a seminal comprehensive study conducted by Margolis & Walsh (2003). In their research, the authors examined 127 studies

over a thirty year period and found that findings from these studies were not one directional or consistent. For example, of 109 studies that attempted to ascertain whether or not firms' green initiatives enhanced financial performance, 54 reported positive relationships, 28 reported non-significance, 20 had mixed findings while 7 reported negative relationship (Margolis & Walsh, 2003). Other researchers examining the issue have reported similar findings. For example, Clarkson et al., (2011) found a bi-directional temporal relationship between firm's environmental initiatives and financial performance. The authors reported that firms experiencing significant environmental performances over time also experienced congruent or similar financial performance changes. Such findings are in congruence with the natural resource based theory of the firm as proposed by Hart (1995), which postulates that firms stand to gain competitive advantages by adopting environmental initiatives. However, Clarkson et al., (2011), cautioned that while the evidence suggests that it "pays to be green", all firms should not adopt green strategies, especially if they divert resources away from core functions. Instead, they argued that green initiatives should be adopted by firms with ample resources to sustain core functions, while pursuing such initiatives. This notion was accentuated by Alberto-Aragon & Sharma, (2003), who found that investment in green initiatives by some firms can deplete resources, thereby rendering them uncompetitive.

Classifying Firms Based on Green and Financial Performance

Regarding classifying firms based on simultaneous green and financial performance, Jackson and Parsa (2009), after a review of extant literature suggested that firms can be classified into four categories based on simultaneous performance on both initiatives. They suggested that firms can be classified as: *aggressive* or firms that perform well on financial initiatives but poorly on green initiatives; *green*, or firms that excel on green initiatives, but perform poorly financially; *progressive*, or firms that excel simultaneously on both financial and green initiatives and; *repressive* or firms that underperform financially and on green initiatives.

Methodology

Data

This research explored the relationship between major suppliers to the tourism sector firms' green scores and their financial performance. To accomplish this, a sample of firms was selected from Newsweek's 2012 list of top 500 green companies. Since 2009, Newsweek has collaborated with leading environmental research firms, Trucost and Sustainalytics to provide rankings of the top 500 green companies. The rankings are compiled using quantitative analysis and firms receive a rank order composite score based on three performance criteria: environmental impact; environmental management and; environmental disclosure. These criteria are discussed below. The environmental impact score is based on data compiled by Trucost. This criteria comprises quantitative and standardized measurements of the overall environmental impact of a company's global operations. More than 700 metrics—including emissions of nine key greenhouse gases, water use, solid-waste disposal, and emissions that contribute to acid rain and smog—are factored into the environmental impact score. The environmental management score is based on an analysis of companies tracked in Sustainalytics' Global Platform, and is an assessment of how a company manages its environmental performance through policies, programs, targets and certifications. To account for a company's overall environmental footprint, Sustainalytics focuses on three distinct spheres of influence: company operations, contractors and suppliers, and products and services. The environmental disclosure score assesses each company's transparency with regards to its environmental performance. Data from Trucost and Sustainalytics contribute equally to this score (each weighted as 50 percent). Of the 500 companies, 20 were identified as suppliers to the hospitality industry. The Newsweek green rankings were deemed appropriate for this study since it provided rankings of firms that are major suppliers to the hospitality industry. Using the Newsweek rankings is in keeping with the notion proposed by Jones & Ratnatunga (2012), that, the choice of proxy utilized by researchers should be based on the advantages of the proxy in relation to addressing the researchers' specific needs and the research at hand. Accounting data were used to assess sampled firms' financial performance. Specifically, the profit margins for sampled firms were retrieved from the COMPUSTAT database and utilized as a measure of financial performance. Sampled firms are presented below in table 1, which also provides their green scores and profit margins.

Table 1: Green Scores and Profit Margins of Sampled Firms

<i>Corporation</i>	<i>Green Score</i>	<i>Profit Margin</i>
Coca-Cola Enterprises	67.8	8.40%
The Coca-Cola Company	58.1	18.78%
PepsiCo	57	9.43%
Campbell Soup	55.3	10.79%
H. J. Heinz	54.6	8.79%
Hershey	52.6	9.95%
Dr Pepper Snapple Group	51.9	10.49%
Kraft Foods	51.5	8.99%
General Mills	51.4	9.41%
Molson Coors Brewing	50.9	11.31%
McCormick	50	10.16%
ConAgra Foods	49.7	3.50%
Smithfield Foods	49.1	2.76%
Dean Foods	48.7	1.71%
Kellogg	47.3	6.77%
Hormel Foods	43.7	6.08%
J. M. Smucker	43.6	8.32%
Bunge	33.7	0.10%
Tyson Foods	29.7	1.76%
Archer-Daniels-Midland	27.5	1.52%

Procedure

Both measures of performance, the profit margins and the green scores were operationalized using SPSS to identify the relationship and relative positioning of the sampled firms with respect to each other based on their green initiatives and profit margins. To accomplish this task, multidimensional scaling was deemed appropriate and utilized. This technique was selected since it succinctly summarizes data about associations between a fixed

set of objects to reveal relationships between them. Further, multidimensional scaling transforms data to indicate the similarity or dissimilarity of objects (such as environmental and financial performance) to scores, thus indicating distances among the objects. A “map” is then created to display the distances among the objects, thus producing a visual output which is useful for interpretive purposes. In addition, the technique was appropriate for the sample size since MDS works best with a relatively small number of object or pairs.

The technique works as follows. When the number of objects or pairs is high, parsimonious comparison of all the items or pairs becomes impractical and inefficient. Objects closer together on the map are perceived as more similar and objects further apart are perceived as more dissimilar. The same unit of measurement is used for all distances among the objects. A similarity or dissimilarity matrix ‘proximity matrix’ is created with Euclidean distances and used as raw data for MDS. To create the proximity matrix, cluster analysis is conducted and the resulting matrix was utilized to create the perceptual map. MDS algorithm employs Euclidean principles where distance (d_{ij}) between points i and j is defined as:

$$d_{ij} = \sqrt{\sum_a (x_{ia} - x_{ja})^2} \quad (1)$$

x_i and x_j specify coordinates of points i and j on dimension a , respectively. For non-metric data a positive monotone transformation is applied to dissimilarity data for scaling into spatial distances while for metric MDS a linear transformation function is applied (Giguère, 2006). Subsequently, a stress function that measures the fit between input proximities and distances is defined. An iterative process that attempts to find successive approximations to the solution is run until the stress function has been minimized (Arce & Garling, 1989; Kruskal & Wish, 1978). Stress indicates the difference between the input proximities and the output distances in the n -dimensional map. Kruskal’s stress function (1964) is the most commonly used measure in determining a model’s goodness of fit and is defined by:

$$Stress = S = \sqrt{\frac{\sum_{ij} (\delta_{ij} - d_{ij})^2}{\sum_{ij} d_{ij}^2}} \quad (2)$$

Where δ_{ij} is the value of the proximities between items i and j , and d_{ij} is the spatial distance between them. Stress function values lay between zero and one; the smaller the stress function, the better the model represents the input data. Although there is no strict rule regarding

how much stress is tolerable, the rule of thumb is that a value ≤ 0.1 is excellent (Kruskal & Wish, 1978). Non-zero stress indicates that some, or all, distances in the map are, to some extent, distortions of the input data. Squared correlation index (R^2) is the other diagnostic tool for assessing the appropriateness of the MDS model. This indicates the proportion of variance of the input data accounted for by the MDS procedure. An $R^2 \geq 0.60$ is considered acceptable fit (Meyer, Heath, Eaves & Chakravarti, 2005). The proximity matrix created for the sample is highlighted below in table 2.

Table 2: Proximity matrix for sampled firms**Table X: Proximity matrix of sampled firms**

	Ent	Coca-Cola	PepsiCo	Soup	H. J. Heinz	Hershey	Dr Pepper	Kraft Foods	Mills	Coors	McCormick	Foods	Foods	Dean Foods
Coca-Cola Ent	0.00													
Coca-Cola	6.35	0.00												
PepsiCo	1.33	4.32	0.00											
Campbell Soup	1.99	3.24	0.12	0.00										
H. J. Heinz	1.91	5.06	0.08	0.20	0.00									
Hershey	2.65	4.18	0.22	0.11	0.11	0.00								
Dr Pepper	2.98	3.81	0.34	0.13	0.22	0.02	0.00							
Kraft Foods	2.92	5.21	0.34	0.32	0.11	0.06	0.11	0.00						
General Mills	2.99	4.82	0.34	0.26	0.13	0.03	0.06	0.01	0.00					
Molson Coors	3.54	3.32	0.58	0.23	0.46	0.12	0.04	0.27	0.18	0.00				
McCormick	3.62	4.39	0.56	0.33	0.32	0.08	0.04	0.09	0.05	0.07	0.00			
ConAgra Foods	4.77	12.29	2.32	2.96	1.64	2.14	2.46	1.52	1.75	3.02	2.19	0.00		
Smithfield Foods	5.39	13.55	2.88	3.60	2.12	2.68	3.03	1.98	2.24	3.64	2.71	0.03	0.00	
Dean Foods	6.20	15.34	3.70	4.54	2.85	3.51	3.92	2.70	3.00	4.60	3.54	0.17	0.06	0.00
Kellogg	4.73	8.39	1.38	1.50	0.78	0.81	0.92	0.44	0.53	1.16	0.65	0.59	0.83	1.28
Hormel Foods	6.62	10.23	2.49	2.57	1.66	1.61	1.70	1.08	1.20	1.92	1.26	0.72	0.86	1.21

J. M. Smucker	6.41	7.70	2.03	1.80	1.33	1.02	0.99	0.70	0.72	1.02	0.61	1.55	1.86	2.44	0
Bunge	16.11	23.72	10.23	10.73	8.49	8.68	8.94	7.36	7.70	9.43	7.89	3.37	2.94	2.59	4
Tyson Foods	18.05	23.11	11.05	11.18	9.21	9.04	9.15	7.77	8.03	9.41	7.98	4.52	4.17	3.95	4
Archer- Daniels- Midland	20.10	24.94	12.61	12.69	10.64	10.39	10.48	9.05	9.32	10.72	9.22	5.58	5.18	4.92	5

Results and discussion

This study focused on the relationship between hospitality industry suppliers' green rankings, as indicated by their green score and their financial performance. The study employed a multidimensional scaling technique to examine this relationship. Results from the analysis provided a Young's stress value of $Y = 0.007$, and $R\text{-squared} = 0.99$. The aggregate output of firms displaying similar performance on the two dimensions, environmental/sustainability and financial, are clustered on the four quadrants of the perceptual map depicted in figure 1, while table 3 shows stimulus coordinates which are analogous to factor loadings in a conventional principal component analysis. The x axis (figure 2), depicts sampled firms' financial performance while the y axis represents firms' performance on environmental or sustainability initiatives. Firms displaying similarity in performance on both dimensions are grouped in clusters on the map's four quadrants.

Figure 1: Perceptual map: green scores and financial performance

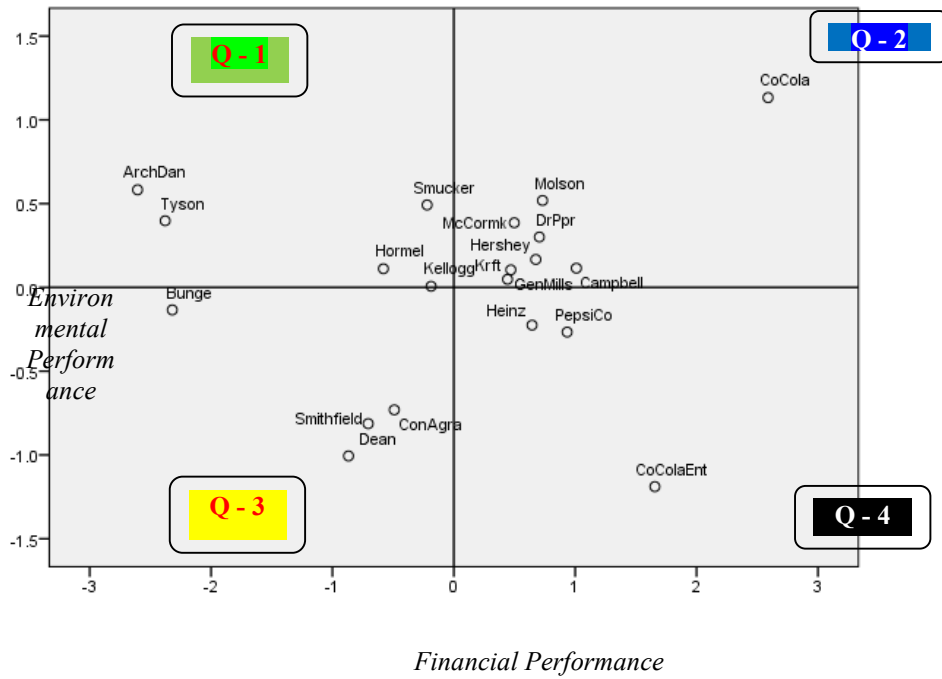


Table 3: Stimulus Coordinates Associated With Each Dimension
(n=20; Stress=.007; RSQ=.99)

<i>Corporation</i>	Dimension 1	Dimension 2
	<i>Financial Performance</i>	<i>Sustainability</i>
Coca Cola Enterprise	1.6563	-1.189
Coca Cola	2.5891	1.1329
PepsiCo	0.9339	-0.2666
Campbell Soup	1.0098	0.115
H.J. Heinz	0.6446	-0.2252
Hershey	0.675	0.167
Dr. Pepper Snapple Group	0.7047	0.3008
Kraft Foods	0.4422	0.0484
General Mills	0.4699	0.1051
Molson Coors Brewing	0.7312	0.5187
McCormick	0.4978	0.3859
ConAgra Foods	-0.4903	-0.7305
Smithfield Foods	-0.7055	-0.8131
Dean Foods	-0.8679	-1.0058
Kellogg	-0.1872	0.0069
Hormel Foods	-0.5801	0.1116
J. M. Smucker	-0.2201	0.4921
Bunge	-2.3197	-0.1344
Tyson Foods	-2.3784	0.3977
Archer Daniels Midland	-2.6052	0.5826

Firms clustered on quadrant 1 (Q1) performed well on green initiatives but low on profitability. Firms on this quadrant were: Archer-Daniels-Midland (stimulus coordinates: -2.605 profitability; 0.583 environmental); Tyson Foods (stimulus coordinates: -2.378 profitability;

0.398 environmental); J.M. Smucker (stimulus coordinates: -0.220 profitability; 0.492 environmental) and; Hormel Foods (stimulus coordinates: -0.580 profitability; 0.112 environmental). While these firms ranked high on green initiatives, their financial performance was low relative to the sample. Although this study was not designed to ascertain cause and effect, it appears as though these firms' performance is in congruence with the trade-off hypothesis. Hence, it is plausible to assert that for-profit firms that excel on green initiatives at the expense of profitability will regress organizationally and consequently, gains achieved on green initiatives will be lost in the long run due to resource scarcity. While it might be acceptable for not-for-profit firms to excel in green performance unilaterally, in the long term, such performance will lead to stakeholder disapproval for profit-maximizing firms. This is seen from the perspective that long term survival of firms is contingent on their ability to generate both profits and societal goodwill. Hence, firms should strive to excel on both environmental and financial performance. According to Jackson & Parsa (2009), firms on this quadrant can be classified as green, since they excelled unilaterally on this initiative.

Firms clustered on quadrant 2 (Q2) achieved both high environmental and financial performances, as indicated by their high stimulus coordinates relative to the sample. These included: Coca Cola (stimulus coordinates: profitability 2.589; environmental 1.133); Molson Coors Brewing (stimulus coordinates: 0.731 financial; 0.519 environmental); McCormick (stimulus coordinates: 0.498 financial; 0.386 environmental); Dr. Pepper Snapple Group (stimulus coordinates: 0.705 financial; 0.301 environmental); Hershey (stimulus coordinates: 0.675 financial; 0.167 environmental); Kraft Foods (stimulus coordinates: -0.442 financial; 0.048 environmental); General Mills (stimulus coordinates: 0.469 financial; 0.105 environmental); Campbell Soup (stimulus coordinates: 1.009 financial; 0.115 environmental). It is interesting to note that firms clustered on this quadrant were amongst the firms with the highest green scores and profit margins, suggesting that firms can excel on both environmental and financial initiatives simultaneously, thereby dispelling the trade-off hypothesis. Ideally, firms pursuing environmental initiatives should aspire to be on this quadrant since they will achieve excellence in environmental and financial performance. Hence, this quadrant typifies firms taking a balanced approach to environmental adoption and financial management. Firms on this quadrant can be described as progressive since they have adopted a balanced approach congruent

with the modern economic perspective, and thus are progressing financially as well as on environmental initiatives.

Firms clustered on quadrant 4 (Q4) achieved high financial performance but scored low on green initiatives. Firms on this quadrant were: H.J. Heinz (stimulus coordinates: financial, 0.645; environmental, -0.225); PepsiCo (stimulus coordinates: 0.933 financial; -0.2667 environmental) and; Coca Cola Enterprise (stimulus coordinates: 1.656 financial; -1.189 environmental).

Although these firms are ranked amongst the top 500 green firms according to the Fortune, further analysis suggests that they are more aggressive in regards to pursuit of financial. Hence, pursuit of environmental initiatives appears to be undertaken as a secondary role to complement profit motives. Furthermore, it is plausible to expect that firms falling on this quadrant will be laggards in voluntary adoptions of green initiatives, but will adopt mandatory and legislated initiatives.

Finally, firms clustered on quadrant three (Q3) performed poorly on both dimensions, as indicated by their stimulus coordinates. Firms on this quadrant were: Bunge (stimulus coordinates: -2.319 financial; -0.134 environmental); Smithfield Foods (stimulus coordinates: -0.706 financial; -0.813 environmental); Dean Foods (stimulus coordinates: -0.868 financial; -1.006 environmental) and; ConAgra Foods (stimulus coordinates: -0.490 financial; -0.731 environmental). Kellogg Foods (stimulus coordinates: -0.580 financial; 0.112 environmental) was placed between Q3 and Q1 suggesting that the company appears to be achieving gains on green initiatives and is progressing towards Q1. Unlike progressive firms that have fully embraced the modern stakeholder-driven economic perspective, firms on Q3 appeared to have adhered to the traditional economic perspective and have only embraced minimal, and mandatory green standards. These firms can be described as repressive since they have not fully exploited green initiatives or fully utilized resources to generate relative superior profits.

Conclusion

Environmentally responsible logistics (ERL) has become an important element in assessing firms' overall commitment to sustainability. Increasingly, stakeholders, especially socially responsible investors are demanding that firms adhering to green principles and practices ensure that firms in their supply chain adhere to green practices. Failure to conduct transactions with green suppliers could expose hospitality green practicing firms to criticism of engaging in green washing. As such, firms are increasingly encouraged to conduct business with partners adhering to the principles of environmentally responsible logistics. This is especially for food and beverage and related firms since the production of food and beverage items generates negative externalities that impacts the environment. However, firms adhering to the traditional economic theory of minimal compliance are often skittish about expending resources on initiatives that are difficult to quantify, such as green initiatives. For such firms, it is important to illustrate that firms can excel on green initiatives and financial performance simultaneously. In addition, given the growing importance of performance on these two factors to investors, it is important that firms' performance is depicted in a non-esoteric manner. In this regard, the methodology employed in this research, multidimensional scaling (MDS) provides an excellent way for stakeholders to simultaneously assess the financial-sustainability performance of firms.

This research is the first study that sheds light on the empirical link between sustainability and financial performance of firms in the food and beverage supply chain. Results indicate that firms ranked high on environmental initiatives as indicated by their green scores, performed better financially than those ranked lower. This finding suggests firms in the food and beverage supply chain can excel simultaneously on both environmental and financial initiatives. However, it is important to note that while today's firms should strive to excel on environmental initiatives, investments in such initiatives are typically realized in the long term and as such, require long term commitment from senior management. Findings also suggested that in regard to sustainability-financial performance, food and beverage suppliers can be classified into four distinct categories: *progressive firms* or those that excel on green initiatives and perform well financially in a balanced manner; *repressive firms* or those that perform poorly on both dimensions; *aggressive firms*, or those that perform admirably financially but poorly on environmental initiatives and; *green firms*, or those that perform admirably on green initiatives

but poorly financially. It is hoped that classifying firms in this manner will be utilized in the lexicon used to describe firms' sustainability-financial performance.

Although this research provided novel insight into the contingent relationship between environmental initiatives and financial performance, it had limitations which future studies are encouraged to overcome. First, environmental or green performance was proxied using green ranking scores obtained from the annual Newsweek green rankings while the accounting measure, profit margin proxied financial performance. The Newsweek green rankings were developed in an atheoretical manner and thus can be perceived as an imperfect measure as a proxy. Notwithstanding, the measures employed in this research captured the relationship between sampled firms' green scores and financial performance. However, future research would be well served to reexamine our results using several different proxies for green and financial performance. In addition, this research utilized a relatively small sample of twenty US domiciled firms, which compromises its generalizability. Future studies are encouraged to utilize a larger sample size, and well as firms domiciled in other international jurisdictions.

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