

Sustainable Business Practices in the United States: A Survey on Implementation

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Abstract

A survey was designed and administered to 172 business professionals in the United States in 2015 to obtain their assessments of both the current status and future development of sustainable business practices at their companies. Despite the recent attention given to corporate social responsibility, we find that only 34 percent of respondents have a comprehensive sustainable management plan currently in place. However, the survey indicates that by 2021 that percentage is expected to increase to 54 percent. We also find that the six most popular sustainable business practices are recycling material, reducing waste, using less paper, employing energy-efficient technologies, conserving water, and adopting energy-efficient building designs. Respondents indicate their firms are likely to increase expenditures or investment in these same six sustainable practices from 2016-2021. This suggests these particular practices are viewed as being more feasible and beneficial to implement. Among the background variables investigated, we find that affiliation with an organization promoting sustainability is the most prominent; respondents affiliated with sustainability organizations are more likely to engage in sustainable business practices. Another significant background variable is firm size; large firms are more likely to be engaged in sustainable practices than smaller firms.

Keywords: sustainability, business practices, implementation

1. Introduction

1.1 Research Issue

Sustaining the Earth's environment is an important and urgent issue considering there is not much time left to reverse the human harm done to the planet. It is a major topic of public forums in every part of the world (Lemonick, 2009) and is prominent in the pages of business news media such as Forbes (Dill, 2016) and the Harvard Business Review (Osberg & Martin, 2015). As a major player in human activities across the globe, business entities have an important role in successfully achieving sustainability goals. Being environmentally friendly is not just trendy, however, it is also key to the long-term viability and profitability of businesses (Horngren et al., 2015). Hence, many consulting firms are providing strategies to assist business entities in implementing sustainable practices. In addition, not-for-profit and government agencies are also promoting sustainable business practices. For example, the U.S. Small Business Administration is a government agency that has extensive guidelines on its website to promote sustainable business practices.

The importance of sustainable business practices brings up the following questions. What sustainable business practices are currently being used by business entities? Do businesses anticipate a major shift in the relative importance of these practices in the future? What recommendations can be given to business entities for implementing sustainable practices? In what areas and how can regulatory agencies provide more incentives to induce entities to adopt sustainable practices? The answers can provide instrumental knowledge for anyone who would like to serve as an effective facilitator for implementing sustainable business practices. However, current research provides scant information to address these questions. The need to fill that void and better understand the current and future status of sustainable business practices is the motivation behind our study.

The best source of information to address these questions is business professionals themselves, particularly those who are involved with the implementation of sustainable business strategies. Therefore, we designed a survey instrument to identify the extent to which firms currently implement sustainability practices and the major types of practices being used. The survey also asked for their perceptions about the future development of these

practices.

A literature review, the methodology used in our study, and results are detailed in the following sections. Our research contributes to the literature in three ways. First, our study is one of the few studies focusing on U.S. sustainable business practices. Second, our study investigates future plans for sustainable business practices, an area seldom addressed in other sustainability field studies. Finally, most of the prior field studies are descriptive in nature whereas our study involves formal hypothesis testing to add statistical validity to our conclusions.

1.2 Literature Review

To assist small businesses in implementing sustainable practices, the U.S. Small Business Administration (2017) provides guidelines for several areas for businesses to explore: becoming energy efficient, improving waste management, investing in renewable energy, and adopting environmentally sound business practices. Included in the list of environmentally sound practices are developing an environmental management plan, complying with environmental regulations, conserving water, exploring green commuting options, reducing greenhouse gas emissions, committing to environmentally preferable purchasing, and understanding the impact of climate changes on a business. However, the U.S. Small Business Administration recommends these green business practices without any discussion or assessment as to which practices are most effective or more readily implementable. Therefore, businesses are left to develop their own implementation priorities.

Harris Interactive conducted an international survey on sustainable practices for Dow Corning in 2007. The sample included a cross-section of companies from seven countries. For the global sample, the survey found that the sustainable practices receiving the highest priority are reducing waste (78%), developing green products (65%), increasing energy efficiency (55%), reducing greenhouse gas emissions (51%), and using renewable energy (44%). Although there were some similarities across regions, different regions and even countries within those regions placed different priorities on these practices. For example, waste reduction ranked lower in Asia than other geographic areas. As another example, although both countries are in Asia, the development of products that are environment-friendly is seen as relatively more important by managers in South Korea (65%) than in China (45%).

In 2011, McKinsey & Company conducted a survey of international companies regarding sustainability management. They found that an increasing number of companies are pursuing sustainability to reduce costs and seek new business opportunities rather than promoting public image and reputation. The most common sustainability practices identified by the survey were reducing energy use in operations (63%), reducing waste (61%), reducing emissions (43%), reducing water usage (38%), leveraging sustainability of existing products to reach new customers (28%), and achieving higher prices or greater market share from sustainable products (18%).

In its 2015 global survey, BSR/GlobalScan found that an increasing number of companies perceive value in pursuing sustainable business practices and have started to integrate sustainability into overall business strategies. However, some companies still do not embrace it wholeheartedly or view it as a stand-alone initiative. Among the practices surveyed, respondents rated managing energy use and controlling green gas emissions as the highest priorities followed by saving water and use of renewable energy alternatives. In addition to having a global focus, the survey questions relating to sustainable business practices tend to be more general rather than specific.

At a more micro-level, Harmon et al. conducted a 2012 survey in the State of New Jersey that found business entities rated sustainable business practices in the following order: recycling, improving energy efficiency, reducing use of paper, applying green technology in manufacturing processes, reducing greenhouse emissions, green product innovations, green purchasing, reducing water use, green building, and use of renewable energy sources. As opposed to the global nature of the Harris Interactive and McKinsey & Company studies, the sample in this study is strictly limited to the State of New Jersey.

A limitation of the above studies is that they are either conducted in an international environment (Forbes, Harris Interactive, and BSR/GlobalScan surveys) or one state (Harmon et al.). Because different countries/states potentially face varying economic, social, and environmental challenges, what works in one may not be successful in another. In addition, none of these studies explore the future sustainability plans of the firms that participated. Our study addresses these limitations by surveying business professionals in the United States (i.e., not too broad and not too narrow) and also measures their perceptions of future practices.

1.3 Research Hypotheses

Based on the literature, we believe that not all sustainable practices are equally attractive to business entities that

are considering implementing these practices. Businesses in the past have had a tendency to implement sustainable strategies that bring immediate or direct benefits to their entities (e.g., consuming less energy, using less paper, conserving water, recycling materials, and reducing waste). Sustainable business practices that do not directly or immediately produce benefits to the business entities tend to receive secondary consideration when it comes to implementation (e.g., green marketing, green certification, use of renewable energy, and reducing emissions). This is understandable given the competitive business environment and additional costs required to implement these latter practices. We state the immediate cost/benefit consideration in implementing sustainability in the first hypothesis.

Hypothesis 1: Sustainable business practices that produce immediate or direct benefits are more likely to be implemented by business entities.

Because sustainable business practices are just starting to catch the attention of business entities, and the U.S. economy is still slowly recovering from the 2008 recession, we anticipate that, in the next five years (2016-2021 at the time of the survey), the direct or immediate cost saving consideration will continue to be the dominating concern for business entities over secondary sustainable practices. This expectation is stated in the second hypothesis:

Hypothesis 2: Sustainable business practices that produce immediate or direct benefits will continue to be more likely to be implemented by business entities from 2016-2021.

2. Method

2.1 Research Approach

Following previous studies, we employed a survey method to collect our data. Considering our research problem and purpose, the survey method was selected as the most appropriate and efficient method to collect the data. For example, the survey method is frequently used when the researchers do not have extensive knowledge about the construct of the variables and the relationships among the variables (Billings & Halsted, 2004).

We imposed the following constraint on the scope of our investigation. Sustainability practices are typically classified into three dimensions: environmental, economical, and social. These three dimensions are defined by FrontStream (2013) as follows: (1) *environmental sustainability* relates to the maintenance of a healthy natural environment through the reduction of toxic chemicals, waste, greenhouse gas emissions, energy consumption, and depletion of natural resources; (2) *social sustainability* aims at building an equitable community through the hiring of disadvantaged employees, enhancement of human health, purchase and hiring from local resources, and payment of livable wages; and (3) *economical sustainability* strives for the maintenance of economic efficiency and prosperity through buying only what you really need, enhancing product performance and quality, assessing life-cycle cost and value, leveraging purchasing power, and reducing waste generation.

Out of these three dimensions, environmental sustainability was the first to appear in public discussions and the literature and is also the dimension that has received the most attention from business entities (Daly, 1990). Concerns about the appropriate length of the survey instrument and the corresponding validity of the responses persuaded us to limit the scope of our survey questions to only the environmental sustainability dimension.

2.2 Survey Instrument

A survey instrument was designed to collect data regarding the implementation of sustainable practices by business entities. To make the survey manageable in response time and more efficient in its administration, we used a closed-ended instrument for our study. Instead of open-ended questions, we presented to our subjects a list of common sustainable practices and asked them the extent their companies engaged in those practices. To construct our list of commonly implemented sustainable practices, we included most of the sustainable practices discussed in previous studies noted in the literature review.

The final version of the instrument listed the following thirteen sustainable business practices (P): have a comprehensive sustainability business management plan (P1), launch green marketing (P2), pursue green certification & eco-labeling of products (P3), employ energy-efficient technologies to save energy costs (P4), use renewable energy (P5), adopt energy-efficient designs for buildings (P6), use less paper (P7), recycle materials (P8), reduce waste (P9), conserve water (P10), facilitate green commuting (P11), commit to purchase from green suppliers (i.e., suppliers show practice sustainability themselves, P12), and reduce greenhouse emissions (P13). We asked subjects to rate the engagement of their business entities in each of the above sustainable practices using the following 5-point scale: 1 = "None", 2 = "A Little", 3 = "Fair", 4 = "Considerable", and 5 = "Extensive".

To investigate which of these sustainable practices the respondents believe their entities will invest during the

next five years (2016-2021 at the time of the survey), we also asked the following question: “In the next five years, how likely will your business consider increasing your expenditure or investment in the following sustainable business practices?” The same thirteen sustainable business practices (P1-P13) were presented to the subjects who registered their responses using the following 5-point scale: 1 = “Very Unlikely”, 2 = “Unlikely”, 3 = “Neutral”, 4 = “Likely”, and 5 = “Very Likely”.

To determine if subjects’ responses were associated with other background variables, we also collected demographic data on the following: gender, age, highest education degree, religious affiliation, political affiliation, job position and title, type of industry, years of business experience, firm size, attitudes toward sustainability in general, and membership in an organization promoting sustainability.

2.3 Subjects and Sample

The survey instrument was administered to 176 business executives and professionals in the United States who have knowledge or are responsible for implementing sustainable practices in their firms. The respondents’ companies were located in various geographical areas of the United States and represent a wide cross section of industries. Four of the surveys were incomplete, therefore a total of 172 usable responses are included in the analysis. Table 1 summarizes the hierarchical positions held by these respondents in their firms and Table 2 reports the industries represented by the 172 respondents.

Table 1. Job titles of survey respondents

<i>Job Title</i>	<i>Number</i>	<i>Percentage</i>
CEO	15	8.7%
Owner	14	8.1%
VP Operations	12	7.0%
VP Finance	22	12.8%
VP Public Relations	5	2.9%
General Manager	24	14.0%
Controller	31	18.0%
Sustainability Coordinator	7	4.1%
Manager	17	9.9%
Director	12	7.0%
Environmental Engineer	8	4.6%
Other	5	2.9%
<i>Total</i>	<i>172</i>	<i>100.0%</i>

Table 2. Industries represented by survey respondents

<i>Industry Classification</i>	<i>Number</i>	<i>Percentage</i>
Agriculture/Farming	5	2.9%
Automotive	4	2.3%
Aviation/Aerospace	2	1.2%
Business Consulting	3	1.7%
Chemicals	5	2.9%
Commerical Services	4	2.3%
Computers/Software	6	3.5%
Conglomorrates	7	4.1%
Construction	5	2.9%
Construction Materials	2	1.2%
Consumer Durables	6	3.5%
Education	3	1.7%
Energy	10	5.8%
Energy Utilities	11	6.4%
Environmental Engineering	3	1.7%
Equipment	5	2.9%
Financial Services	7	4.1%
Food and Beverage Products	14	8.1%
Forest and Paper Products	1	0.6%
Government and Non-Profits	4	2.3%
Health Care Products	11	6.4%
Health Care Services	2	1.2%

Household and Personal Products	3	1.7%
Leisure/Tourism	2	1.2%
Logistics	3	1.7%
Manufacturing	11	6.4%
Media	2	1.2%
Metals Products	4	2.3%
Mining	2	1.2%
Real Estate	5	2.9%
Retail	6	3.5%
Technology Hardware	3	1.7%
Telecommunications	2	1.2%
Textiles & Apparel	2	1.2%
Tobacco	1	0.6%
Transportation/Shipping	2	1.2%
Wholesale/Distribution	4	2.3%
<i>Total</i>	<i>172</i>	<i>100.0%</i>

2.4 Statistical Tests

To test our hypotheses, the thirteen sustainable business practices presented to the subjects were classified into two categories: six practices that are expected to result in direct or immediate cost savings or benefits to the business entities and seven practices that are not expected to have direct or immediate financial benefits to the business entities (see Table 3). These *a priori* classifications will be tested by performing a cluster analysis on the subjects' responses. The subjects' mean rating on these two categories of sustainable practices will also be compared using a paired-samples t-test. Finally, analysis of variance (ANOVA) or regression analysis will be used to assess if any of the background variables has an impact on the subjects' responses.

Table 3. Classification of expected impact of sustainable practices on business

<i>Practices Expected to Result in Direct Cost or Immediate Financial Benefits</i>	<i>Practices that are Not Expected to have Direct or Immediate Financial Benefits</i>
Employ energy-efficient technologies (P4)	Have a comprehensive sustainability business plan (P1)
Adopt energy-efficient designs for buildings (P6)	Launch green marketing (P2)
Use less paper (P7)	Pursue green certification & eco-labeling of products (P3)
Recycle materials (P8)	Use renewable energy (P5)
Reduce waste (P9)	Facilitate green commuting (P11)
Conserve water (P10)	Commit to purchase from green suppliers (P12)
	Reduce greenhouse emissions (P13)

3. Results and Discussion

3.1 Descriptive Statistics: Current Practice

Table 4 reports subjects' ratings of sustainable business practices as currently engaged in or implemented by their entities. The ratings measured the subjects' responses to the question: "To what extent is your company engaging in the following environmentally sustainable business practices?" The mean rating for each practice is presented in the third column of Table 4. A rating of "1" means the company has not engaged in the practice at all whereas a rating of "5" represents that the company is extensively engaged in that particular practice. The mean rating ranges from 3.99 to 2.26 across all thirteen practices indicating that environmentally sustainable practices are in the stage of becoming more widely accepted by business entities. However, there is definitely room to grow. This trend is consistent with that documented in prior studies such as the survey conducted by Harris Interactive for Dow Corning (2007).

The practices are listed in descending order by mean rating in Table 4. The top five practices engaged by the firms are: recycling materials (mean = 3.99); reduce waste (3.57); use less paper (3.47); energy efficiency (3.36); and conserving water (3.13). The bottom five practices are: pursue green certification and eco-labeling (2.26); use renewable energy (2.43); facilitate green commuting (2.50); launch green marketing (2.58); and commit to purchase from green suppliers (2.68).

The last column of Table 4 presents the percentage of subjects who reported that their firms have "considerably" or "extensively" (i.e., a rating of 4 or 5) engaged in the respective sustainable practices. For example, 72.8% of

the respondents reported their firms have considerably or extensively practiced recycling materials. In contrast, only 19.8% of the sample reported that they have considerably or extensively engaged in the pursuit of green certification and eco-labeling of products. Of particular interest is that only about one third of the respondents' firms currently have a comprehensive sustainability management plan in place.

Table 4. Extent of engagement in environmentally sustainable practices: current practice

<i>Rank</i>	<i>Sustainable Business Practice</i>	<i>Mean Rating</i>	<i>“Considerable” To “Extensive” Engagement</i>
1	Recycle materials (P8)	3.99	72.8%
2	Reduce waste (P9)	3.57	54.4%
3	Use less paper (P7)	3.47	49.4%
4	Employ energy-efficient technologies (P4)	3.36	44.5%
5	Conserve water (P10)	3.13	40.3%
6	Adopt energy efficient designs for buildings (P6)	3.11	36.7%
7	Have a comprehensive sustainability business plan (P1)	2.91	33.8%
8	Reduce greenhouse emissions (P13)	2.80	30.9%
9	Commit to purchase from green suppliers (P12)	2.68	23.6%
10	Launch green marketing (P2)	2.58	22.9%
11	Facilitate green commuting (P11)	2.50	25.6%
12	Use renewable energy (P5)	2.43	26.6%
13	Pursue green certification & eco-labeling of products (P3)	2.26	19.8%

3.2 Descriptive Statistics: Future Practice

To see if respondents anticipate that sustainability strategies will change in the future, Table 5 (see top of next page) presents the likelihood of future investment in environmentally sustainable practices at their firms. Subjects were asked: “In the next five years, how likely will your company consider increasing expenditures or investment in the following sustainable business practices?” (note: “the next five years” would be defined as 2016-2021 at the time of the survey). The responses were registered on a scale from “1” (Very Unlikely) to “5” (Very Likely). Column 3 of Table 5 tabulates the mean likelihood of each practice from the highest (4.41) to lowest (2.83).

The top five sustainable practices the respondents' expect to invest in from 2016-2021 are: recycle materials (4.41); reduce waste (4.24); use less paper (4.20); employ energy-efficient technologies (4.00); and conserve water (3.90). When compared to the current practices ratings reported in Table 2, the top five rankings are identical. This is a strong indication that currently preferred practices will continue to be implemented and emphasized from 2016-2021. The bottom five practices that are less likely to receive additional investment in that time-frame are: pursue green certification and eco-labeling of products (2.83); facilitate green commuting (3.12); launch green marketing (3.17); commit to purchase from green suppliers (3.24); and reduce greenhouse gas emissions (3.37). When compared with the bottom five ranking for current practice in Table 2, the order of ranking is similar with one exception: the use of renewable energy has moved out of the bottom five for current practice to No. 8 in importance for 2016-2021. This might suggest that subjects in the sample foresee an increase in the supply and/or a decrease in the cost of renewable energy during that time frame.

The last column of Table 5 presents the percentage of subjects reporting that their firms are “likely” or “very likely” (i.e., a rating of 4 or 5) to invest in the respective sustainable practices. For example, 85.4% of the subjects in the sample indicated their firms are likely or very likely to invest in recycling materials. In contrast, only 28.4% of the subjects in the sample indicated that their firms will invest in pursuing green certification and eco-labeling of products from 2016-2021. Also of interest is that 53.7% of the respondents' firms will likely invest in developing a comprehensive sustainability management plan for their businesses, a higher percentage than the 33.8% reported for current practice in Table 4.

Table 5. Likelihood of investment in environmentally sustainable practices: future practice 2016-2021

Rank	Sustainable Business Practice	Mean Rating	“Likely” to “Very Likely” Investment
1	Recycle materials (P8)	4.41	85.4%
2	Reduce waste (P9)	4.24	80.4%
3	Use less paper (P7)	4.20	81.7%
4	Employ energy-efficient technologies (P4)	4.00	76.8%
5	Conserve water (P10)	3.90	68.3%
6	Adopt energy efficient designs for buildings (P6)	3.77	65.9%
7	Have a comprehensive sustainability business plan (P1)	3.50	53.7%
8	Use renewable energy (P5)	3.37	49.4%
9	Reduce greenhouse emissions (P13)	3.37	47.6%
10	Commit to purchase from green suppliers (P12)	3.24	39.0%
11	Launch green marketing (P2)	3.17	43.9%
12	Facilitate green commuting (P11)	3.12	41.0%
13	Pursue green certification & eco-labeling of products (P3)	2.83	28.4%

3.3 Confirmation of A Priori Classifications

To investigate whether or not our *a priori* classification of environmentally sustainable practices into two categories can be confirmed by the subject's responses, we performed a cluster analysis on the mean rating of the thirteen sustainability practices currently engaged by the respondents' companies. The cluster analysis classified the 13 practices into two groups (Cluster 1 and 2). With respect to current practice (Panel A in Table 6), the six practices grouped into Cluster 1 were P4, P6, P7, P8, P9, and P10. The remaining seven practices were grouped into Cluster 2. The distance between the means of the two cluster centers is 0.85 (Panel C) with an F-statistic of 30.546 (Panel D) using analysis of variance which is significant at the 0.000 level. The cluster analysis therefore provides strong support for our *a priori* classification of sustainable practices into two categories.

We also performed a cluster analysis on the mean rating of the expected future investment in the thirteen sustainable practices. The cluster analysis again classified the mean ratings into two groups. The membership of Cluster 1 in Panel B of Table 6 is the same as the membership in Panel A with one exception in that a seventh practice was added: reducing greenhouse emissions (P13). Because P13 was shifted from Cluster 2 to Cluster 1, Cluster 2's membership consists of only six practices. A possible reason for this shift may have to do with the anticipated increased tightening of governmental regulations on greenhouse emissions in the future. The distance between the two clusters is 0.83 (Panel C) with an F-statistic of 39.214 (Panel D) using analysis of variance which is significant at the 0.000 level. Overall, the second cluster analysis provides additional support for our *a priori* classification of these sustainable practices separating those that provide immediate or direct cost savings to the firms versus those that may not provide immediate benefits.

Table 6. Cluster analysis of classifications of sustainable practices

Sustainable Business Practice	Panel A. Extent of Current Engagement		Panel B. Likelihood of Future Investment	
	Cluster	Distance	Cluster	Distance
Have a comprehensive sustainability business plan (P1)	2	0.316	2	0.295
Launch green marketing (P2)	2	0.014	2	0.035
Pursue green certification & eco-labeling (P3)	2	0.334	2	0.375
Employ energy efficient technologies (P4)	1	0.078	1	0.041
Use renewable energy (P5)	2	0.164	2	0.165
Adopt energy efficient designs for buildings (P6)	1	0.328	1	0.271
Use less paper (P7)	1	0.032	1	0.159
Recycle materials (P8)	1	0.552	1	0.369
Reduce waste (P9)	1	0.132	1	0.199
Conserve water (P10)	1	0.308	1	0.141
Launch green marketing (P11)	2	0.094	2	0.085
Green purchasing (P12)	2	0.086	2	0.035
Reduce emissions (P13)	2	0.206	1	0.271
Panel C. Means for Cluster Centers	Cluster 1	Cluster 2	Cluster 1	Cluster 2
	3.44	2.59	4.04	3.21
Panel D. Analysis of Variance	Mean Sq.	Error	Mean Sq.	Error
	2.302	0.075	2.260	0.058
	F-Statistic	Sign.	F-Statistic	Sign.
	30.546	0.000	39.214	0.000

3.4 Tests of Hypotheses

To test if Hypothesis 1 is supported by the data, a paired-samples t-test was conducted on the mean ratings of Cluster 1 and Cluster 2 with respect to current practices. A significant difference between the means of the two clusters would support our hypothesis that not all sustainable business practices are equally attractive to business entities when they are considering implementing sustainability. It is posited that sustainable strategies that have immediate or direct financial benefits are favored in the current implementation processes of respondents' firms. As shown in Panel A1 of Table 7, the mean rating of Cluster 1 is 3.335 whereas the mean rating of Cluster 2 is 2.506 which are different in the expected direction, indicating that sustainable practices that tend to realize direct and immediate financial benefits were strongly favored by the firms as currently implemented. A paired-samples correlation (Panel A2) and two-tailed t-test (Panel A3) are both significant at the 0.000 level (a nonparametric Wilcoxon Rank Sum Test also resulted in the same 0.000 significance level) in the expected direction. Therefore, Hypothesis 1 is supported.

To test if Hypothesis 2 is supported, we performed another paired-samples t-test on the mean ratings of anticipated future investment in Cluster 1 versus Cluster 2 practices from 2016 to 2021 instead of current practice. A significant difference between the two clusters would support our hypothesis that not all sustainable business practices are equally attractive to business entities when respondents are considering further investment in sustainability. It is likely that sustainable strategies that have immediate or direct financial benefits to the firms will continued to be favored by business entities.

Table 7. Hypotheses testing comparison of means between clusters

<i>Panel A. Extent of Current Engagement</i>				<i>Panel B. Likelihood of Investment 2016-2021</i>			
Panel A1. Paired-Samples Statistics				Panel B1. Paired-Samples Statistics			
<i>Cluster</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Std. Error</i>	<i>Cluster</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Std. Error</i>
1	3.335	1.006	0.110	1	4.038	0.806	0.884
2	2.506	1.063	0.116	2	3.157	0.920	0.101
Panel A2. Paired-Samples Correlation				Panel B2. Paired-Samples Correlation			
		<i>Correlation</i>	<i>Sign.</i>			<i>Correlation</i>	<i>Sign.</i>
Cluster 1 and 2		0.714	0.000	Cluster 1 and 2		0.714	0.000
Panel A3. Paired-Samples t-Test (Cluster 1 & 2)				Panel B3. Paired-Samples t-Test (Cluster 1 & 2)			
<i>Mean</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Sign.</i>	<i>Mean</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Sign.</i>
0.829	0.861	9.634	0.000	0.882	0.741	11.889	0.000

Table 7 also reports the paired samples statistics (Panel B1) and correlation (Panel B2) for the clusters defined with respect to anticipated future investment in sustainable business practices. The mean rating of Cluster 1 is 4.038 whereas the mean rating of Cluster 2 is 3.157, indicating that sustainable practices that tend to realize direct and immediate financial benefits will continue to be strongly favored by firms during 2016-2021. A two-tailed t-test resulted in a t-statistic of 11.889 (Panel B3), which is again significant at 0.000 level and in the expected direction (a nonparametric Wilcoxon Rank Sum Test also had 0.000 significance level). Therefore, Hypothesis 2 is also confirmed.

3.5 Analysis of Background Variables

To investigate if any background variables have an effect on subjects' responses, we performed ANOVA on the mean ratings of both current engagement and anticipated future investment in sustainable practices using the following eleven background variables as independent variables: (1) gender, (2) age, (3) highest education degree, (4) religious affiliation, (5) political affiliation, (6) job position and title, (7) type of industry, (8) years of business experience, (9) firm size, (10) individual attitudes toward sustainability, and (11) affiliation with an organization promoting sustainability. We found that all the effects of the background variables were not significant except for association with an organization promoting sustainability and firm size.

The mean rating across practices P1-P13 for subjects who are members of a sustainability organization is 3.458 whereas the mean rating for subjects who are not is 2.665 (see Panel A1.1. of Table 8). The difference is significant at the 0.001 level (F-statistic = 12.780), indicating that firms that affiliated with a sustainability organization reported higher extent of engagement in environmentally sustainable practices than those who are not. The mean across practices P1-P13 for the top 50% of the sample based on firm size is 3.075, while the mean rating of the bottom 50% is 2.706 (Panel A2.1). The differences between the two groups are marginally significant at the 0.081 level (F-statistic = 3.128), indicating that larger firms engaged more in sustainable

practices, a result that is not unexpected.

With respect to a firm's anticipated investment in sustainability practices during 2016-2021, the only significant background variables were membership in a sustainability organization and firm size (same as current practice). The mean likelihood for future investment in sustainability practices for firms affiliated with a sustainability organization is 3.950 whereas the mean likelihood for those firms who are not is 3.473 (Panel B1.1, Table 8). The difference is significant at 0.005 level (F-statistic = 8.337). The mean likelihood of future investment for the top 50% of the firms based on firm size is 3.743 whereas the mean likelihood of future investment in sustainability for the smaller firms is 3.388 (Table B1.2). The difference is significant at 0.043 level (F-statistic = 4.223). Therefore, similar to current practice, respondents who are members of a sustainability organization and/or are at larger firms are more likely to implement sustainable business practices in the future.

Table 8. Analysis of variance for significant background variables

<i>Panel A. Extent of Current Engagement</i>				<i>Panel B. Likelihood of Investment 2016-2021</i>			
<i>Panel A1.1. Affiliation with Sustainability Org.</i>				<i>Panel B1.1. Affiliation with Sustainability Org.</i>			
<i>Group</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Std. Error</i>	<i>Group</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Std. Error</i>
Yes	3.458	1.128	0.235	Yes	3.950	0.764	0.159
No	2.665	0.801	0.104	No	3.473	0.633	0.082
<i>Panel A1.2. Analysis of Variance: Affiliation</i>				<i>Panel B1.2. Analysis of Variance: Affiliation</i>			
<i>Group</i>	<i>Mean Sq.</i>	<i>F-Statistic</i>	<i>Sign.</i>	<i>Group</i>	<i>Mean Sq.</i>	<i>F-Statistic</i>	<i>Sign.</i>
Between	10.414	12.780	0.001	Between	3.758	8.337	0.005
Within	0.815			Within	0.451		
<i>Panel A2.1. Firm Size</i>				<i>Panel B2.1. Firm Size</i>			
<i>Group</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Std. Error</i>	<i>Group</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Std. Error</i>
Top 50%	3.075	1.030	0.161	Top 50%	3.743	0.788	0.123
< 50%	2.706	0.860	0.133	< 50%	3.388	0.784	0.121
<i>Panel A2.2. Analysis of Variance: Firm Size</i>				<i>Panel B2.2. Firm Size</i>			
<i>Group</i>	<i>Mean Sq.</i>	<i>F-Statistic</i>	<i>Sign.</i>	<i>Group</i>	<i>Mean Sq.</i>	<i>F-Statistic</i>	<i>Sign.</i>
Between	2.811	3.128	0.081	Between	2.610	4.223	0.043
Within	0.889			Within	0.618		

4. Discussion

Sustainability is an important issue faced by both society and the business community. It is relevant to survey how various sustainable practices are practiced by firms in different countries under different business environments and cultures. It is also of interest to analyze what type of sustainable practices currently receive more attention from business entities and which of these practices are more likely to be invested in by firms in the future. Several previous studies have shed some light on the status quo of sustainable practices in different geographical areas and environments at various points in time. Our study contributes to the literature in three ways. First, our study focuses on sustainability practices in the United States across various industries of various sizes. Prior studies have either been too broad in scope (i.e., global) or too narrow (i.e., at the state-level). Second, our study tests the hypothesis that certain types of sustainable practices tend to be favored by firms in their implementation process. Third, our study includes an assessment of respondents' potential future investment in sustainability practices. Prior studies have only focused on current practices, not potential future trends.

We found that not all environmentally sustainable business practices are equally attractive to respondents. Practices that have direct or immediate cost savings or other financial benefits are clearly favored and thus more likely to be adopted by their companies. These practices include employing energy-efficient technologies, adopting energy-efficient design for buildings, using less paper, recycling materials, reducing waste, and conserving water. In contrast, practices that have less direct or immediate financial benefits are less likely to be utilized by their firms. These practices include having a comprehensive sustainable management plan for the business, launching green marketing, pursuing green certification and eco-labeling of products, using renewable energy, facilitating green commuting, commitment to environmentally preferable purchasing, and reducing greenhouse emissions. This preference persists across firms, regardless of size or industry. In addition, the preference for sustainable business practices that have a direct or immediate cost savings is expected to continue from 2016-2021 as respondent firms plan for their sustainability management strategies. From the analysis of background variables, we also found that subjects in larger firms and subjects affiliated with an organization that promotes sustainability are much more progressive in implementing environmentally sustainable practices than

their counterparts.

Our findings have several managerial and policy implications for business firms as well as for government regulatory agencies. For companies just beginning to develop sustainability strategies, the easier and more feasible route is to engage in the practices that ranked highest in our study such as recycling materials, reducing waste, using less paper, adopting energy-efficient technology, and conserving water. In this way, the benefits of sustainability are more readily realizable and the cost of implementation is negligible and/or more manageable. For policy makers attempting to encourage sustainable practices across a wider spectrum, more incentives or subsidies should be provided to induce engagement in those that are less favored by the business entities such as green certification and eco-labeling of products, renewable energy, green commuting, green marketing, and green purchasing. In addition, because we found smaller firms are less likely to implement sustainability strategies, governmental incentives or subsidies could be aimed at those firms to help alleviate the proportionally larger costs needed to implement these practices in those firms.

For both companies and policy makers, the evidence shows that involvement with sustainability organizations play an important role in the sustainability movement. Companies wishing to implement sustainable practices are encouraged to join sustainable organizations for support and assistance. Government regulatory bodies should encourage or provide incentives for the expansion of voluntary sustainability organizations to assist business entities. Although government regulations might get business entities' attention initially, it is voluntary sustainability organizations that are more effectively engaging business entities in the implementation of sustainable practices.

5. Conclusion

Business entities are becoming more involved in environmental sustainability practices as the evidence for climate change becomes more convincing and its impact on these entities is more widely felt. Our study found that, in general, business firms in the United States favor sustainability practices that result in direct or immediate financial benefits to the company. On the other hand, respondents are less enthusiastic about other sustainable practices that may benefit the public more than the business itself. The result is consistent with what would be expected in a capitalist business environment that emphasizes the market mechanism such as the United States. An effective approach for encouraging sustainable practices that benefit the public may be through the internalization of external benefits/costs such as the carbon tax.

As noted earlier, our survey has several advantages over previous studies that investigate sustainability practices by conducting a national (rather than global or local) survey, analyzing the responses with formal hypotheses testing, and including firms' future sustainability plans in our enquiry. Despite these advantages, our study has several limitations. First, we narrowed the scope of our investigation to just one dimension of sustainability: environmental. Front Stream (2013) suggests there are other dimensions beyond environmental (e.g., the social dimension) which our study does not address. Second, like any survey study, the validity of the results of a survey depends on sample size, sample variation, and sample method (Billings & Halsted, 2001). Our survey may also be susceptible to these inherent problems. Finally, our study focused on the financial benefits of implementing sustainable business practices. However, there are several additional factors that may affect business entities' implementation of sustainable practices such as attitudes toward sustainability, social expectations, property rights, and the legal environment.

Finally, the issue of sustainability is constantly evolving. The status of sustainable practices will be greatly influenced by factors such as advances in sustainability technology and the dissemination of sustainability knowledge and education. As technology advances, the cost of certain sustainability practices is expected to be lowered, which will in turn provide incentives for business entities to engage in more sustainability practices. As the dissemination of knowledge about sustainability spreads, individuals should also be more inclined to engage in these business practices. Finally, as businesses become more global, the negative impact of ignoring sustainability will become harder to ignore. All these trends will change the picture of sustainable business practices and future research is encouraged to explore the role these factors play in the implementation of these practices.

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