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New Insights On The Operational Links Between Corporate Sustainability And Firm Performance In Service Industries

Jooh Lee¹ Niranjan Pati²

ABSTRACT

Sustainability has become an important strategy for service industries to compete globally. It is as important for service industries to meet their social responsibilities and create value for their stakeholders as their manufacturing counterparts. Service oriented companies are increasingly pursuing sustainability strategies for not only doing “good” for the society but also to translate the goodwill earned to add to their bottom line. Our study examines the impact of Corporate Sustainability Performance (CSP) on a firm’s economic performance in service industries. The primary focus of this study is to establish relationships between corporate sustainability strategies and concomitant economic performance in the context of service industries. As such, this research establishes the directions and magnitudes of the operational relationships between a service firm’s environmental and social performance relative to its economic performance after controlling key strategic factors inherent of service related industries. The results indicate that a firm’s environmental and social performances are significant determinants for improving the overall performance of the firm, particularly, with respect to market-based performance in these industries across the countries included in the study. Further, the accounting-based performance appears to be significantly linked to the social Pacific Sustainability Index (PSI) scores as a proxy measure of the corporate social responsibility and reputation. The combined effects of both environmental and social performance on a firm’s overall performance, particularly market based performance, is also remarkably significant. The findings extend the research of Lee, Pati, Roh (2011) to service industries.

Key Words: Social responsibility, service industry, corporate sustainability performance

JEL Classification: D63, G21

1. INTRODUCTION

Corporate commitment to sustainability is increasingly pursued by progressive businesses around the world. Particularly, service industries are facing increasing demands to not only show financial gains and increase shareholder values, but also to incorporate social and environmental issues into their business practices. The inclusion of these issues in the strategy of a company is important due to their positive implications for business reputation, long term business cost, employee morale, stakeholder satisfaction, and brand differentiation. In today’s competitive global market, a service oriented industry can survive if it exhibits increased operational and market efficiency and provide competitive services. Airlines, utility companies, health care, Information Technology services and other service-oriented firms have implemented long term strategies to reduce their environmental impact, and to improve social conditions in the communities they operate. A service business that focuses on financial, environmental, and societal performance, commonly referred to as Triple Bottom Line (TBL), in its strategy has the propensity to be successful in the long run as opposed to its competitor that emphasizes on only one aspect of the performance metric. TBL encompasses three basic elements—people, planet, and profit. They are expected to complement rather than compete with each other over the long run.

The sustainability initiative of a service firm should not be compliance and regulations dominated. Although adhering to compliance and regulations provide minimal baseline, the objectives should be more encompassing in their scale and scope. For instance, a healthcare organization may choose to add innovative best practices to scope up its activities relative to sustainability in its operations. Similarly, an IT service organization

may want to expand its scale of sustainability activities to include its supply chain—upstream and downstream—in harnessing energy efficiency. The responsibility should not culminate in instant returns but to create a lasting value for the entire supply chain.

It is evident that implementation of sustainability provisions needs important resources which could otherwise be devoted to the core activities of the organization. When service organizations are struggling to maintain their balance sheet black in a challenging economic environment of recent years, the investment in sustainability is seen as extravagant expenses. These views are further fortified by studies that argue that the interest of shareholders is not served when a firm spends resources beyond compliance measures (Friedman 1970; Walley & Whitehead 1994; Elgin 2007). However, quite a few progressive service organizations realize that the current difficult economic environment is bringing opportunities to the forefront for reducing energy consumptions, eliminating wastes and redundancies, reducing greenhouse gases, among others. The action of these companies show that the investments made in implementing sustainability strategies, in fact, pays off more than what it takes, and makes a net tangible contributions aside from bringing scores of intangible benefits such as building goodwill, and brand. Sustainability activities of a service organization also extend their footprint above and beyond to serve the current and future interests of the society.

Albeit the competing views of whether sustainability pays, the long term and systems thinking suggest that we don’t have a choice but to embed sustainability in a business’ core business strategies. It is natural for decision makers to ponder whether doing “good” benefit our shareholders (Lee, Pati, and Roh, 2011),

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and what does a triple bottom line strategy mean for the long term sustainability of a corporation. Results from various academic and corporate studies conducted in the past linking sustainability efforts and their concomitant returns are still ambivalent. A recent report (Haanes et al., 2011) observed a precipitous increase in sustainability commitments from organizations, 25% in 2009 to 59% in 2010. The same study divided the respondent companies into two groups—Embracers and Cautious Adopters—and found that Embracers are three times more likely to believe that their sustainability decisions have been profitable than the group falling into the category of cautious adopters. There is a dichotomy between organizations that feel that they will do well by doing “good,” and the organizations that feel sustainability as a necessary evil to stay in the business.

2. LITERATURE REVIEW

Sustainability has provided fadders to researchers to establish links between an organization's level of commitments and the outcomes it derived from engaging in activities pertaining to sustainability. A majority of these studies focused on either financial accounting performance or market-based performance. As stated in the previous section, these studies have been unconvincing in their assertions. Thus, they fail to provide guidance to the decision makers in regard to adopting a specific course of action if and when presented a situation. Some of the previous studies have sought to find the linkages between the Triple Bottom Line (TBL) and financial, accounting, or market based performance.

Steger et al. (2007) by means of 400 interviews and 1,100 questionnaires, investigated whether and to what extent the importance of the triple bottom line was weighted across oil and gas, utility, airlines, automotive, chemical, pharmaceutical, technology, financial services, and food and beverage industries. Their study suggests that social and environmental concerns across industries depending upon the nature of their operations. For example, a manager in the Oil and Gas industry may weigh environmental concerns higher than a manager in Financial Services. The research suggested that the behavior may be attributed to the way they interact with the environment and how their stakeholders value their interaction. Further, the study corroborated that the capital markets react positively to social and environmental performance.

Cordeiro and Sarkis (1997) studied Toxic Release Inventory (TRI) data to study 523 US firms and inferred that more recycling leads to worse earnings-per-share growth establishing a significant negative relationship between environmental stewardship and earnings-per-share performance. No significant relationship between the total amount of organic carbon emitted and the firm performance such as Sales, ROI, and ROE was found in food industries based in France and U.K. (Aragón-Correa and Rubio-López (2007). Hillman and Keim (2001) found an inverse relation between environmental performance and market-value capital in a study of 308 firms. This result was consistently supported even after changing the dependent variables to Return on Equity (ROE), Return on Assets (ROA), and the Ratio of Market to Book Assets as one of the proxy indicators of market based performance. In a series of similar studies, Wagner et al., (2002) observed a negative relationship between environmental and financial performance in 37 European paper industries. Holman et al. (1985) demonstrated that there was a negative correlation between the total rate of return and federal pollution compliance. Further, Bansal (2005) studied 45 Canadian firms in oil and gas, mining, and forest industries from 1986 to 1995 to infer that

ROE is negatively correlated to sustainable corporate development. Similarly, McWilliams and Seigel (2000) studied 524 firms to find the impact of corporate social performance on financial performance to be insignificant. The study controlled for R&D intensity which appears to have a significant impact on a firm's performance.

From the perspectives of the above studies, a greater investment in corporate sustainable development does not seem to have positive effects on the stockholder's gains and/or the firm's market value. The researchers that asserted a negative effect of the social responsibility on corporate financial performance have the conviction that a high level of commitments to social responsibility and green business issues demands more investments, thus, leading to a shrunk bottom line. These findings have not been consistent with other studies (e.g., Klassen & McLaughlin, 1996; Russo & Fouts, 1997; Waddock & Graves, 1997) that established a positive relationship between environmental and firm performance. Thus, the above studies underscore the lack of research on the composite nature of resource-based factors as well as the deficiency inherent of a single measure of corporate performance.

In an early study of sustainability, Russo and Fouts (1997) reckoned resource-based theory for corporate sustainable development relative to tangible (physical assets and raw materials) and intangible assets (reputation and image). They observed a positive relation between environmental performance and economic performance when other strategic variables such as firm size, capital intensity, and firm and industry growth are controlled. Their regression results confirmed that higher environmental ratings tend to yield higher ROA and that industry growth rate moderates the impact of environmental rating on ROA. This study confirmed the resource-based view of the firm that the intangible benefits of environmental performance materialized in the firm profitability.

The resources-based view of the firm, such as the one cited above, argues that firms with high corporate social responsibility (CSR) orientation are likely to gain more competitive advantages than those with a low emphasis on CSR.

Some of the other studies confirm the efficacy for acquiring corporate sustainable capabilities and their impact on a firm's economic performance (Waddock & Graves, 1997). For instance, Waddock and Graves (1997) studied 469 firms to establish the strategic links between corporate sustainability and the economic performance. The study found that measurement errors might blur the relationship between environmental and financial performance. Their theory was that corporate social performance cannot be captured by a single measure because of its multidimensional constructs relative to internal as well as external assets. Thus, the effect of Corporate Social Performance (CSP) on the firm's economic performance may vary significantly depending on the choices of constructs. They used KLD (Kinder, Lyndenbergh, & Domini) data that captures multidimensional assessment measures with eight attributes of CSP.

Edwards (1998) rendered support to the theme “it pays to be green” by showing a positive relationship between



environmental and accounting performance measured in terms of ROE. In addition to the above research, some of the other studies that found positive relationship between environmental and economic performance are: Hart & Ahuja (1996), McGuire et al., (1988). Wagner (2005) posited that firms with a higher emphasis on the corporate sustainability (i.e., pollution prevention-oriented corporate environmental strategies) show a positive influence on the economic performance at the firm level in terms of Return on Capital Employed (ROCE), ROS, and ROE

Firms with stellar financial performance put more emphasis on social responsibility as they have disposable resources to undertake such activities. Similarly, firms with high social responsibility orientation tend to be more successful in improving financial performance compared to the firms that are not strong in this realm. McGuire et al. (1988) demonstrated that a firm's prior performance with respect to both stock market returns and accounting-based performance (e.g., ROA, total assets, growth in sales, asset, and operating income) is closely related to corporate social responsibility. Using 14 different manufacturing sectors, Klassen and McLaughlin (1996) found that environmental management can play a positive role in improving the corporate financial performance. Quite a few studies have argued in favor of a positive relationship between sustainability and financial performance because sustainability efforts improve employee and customer goodwill, create economic benefits through a firm's improved standing with its constituencies such as government, banks, and other stakeholders (McGuire et al., 1988), and enhanced social image and reputation (Edwards, 1998; Hart and Ahuja, 1996; Waddock and Graves, 1997).

In an elaborate study, Konar and Cohen (2001) studied the significance of CSR performance relative to tangible and intangible assets. In investigating the relationship between environmental performance and financial performance with respect to the market value, they argued that a firm with a better environmental performance has a significant positive impact on the firm's market value which is a good predictor of the firm's expected future profitability (Tobin's Q). Accordingly, firms with high attention to their brand on environmental issues are likely to do well in the marketplace for their environmental stewardship.

One of the main reasons for inconclusive results on the study of corporate sustainability and related performance indicators might be due to the clarity on the proxy of performance measures. The lack of consistent results between firms emphasizing corporate social responsibility with a triple bottom line and firm's financial performance may be attributed in part to the ambiguous definitions of Corporate Sustainability, and its performance. Lee, Pati, and Roh (2011) tabulated a list of research that relates sustainability performance to a firm's overall performance.

3. MOTIVATION

Service industries have become a dominant economic force globally. About 2/3 rd of GNP is accounted in the service sector of the economy. Therefore, it is imperative that we understand the contributions of this sector of the economy to make the world a better place. For instance, a service company like Seattle based Starbucks Corp. responded to its consumer demand to make fair-trade coffee available. However, it is a misnomer that service industries don't leave a huge environmental footprint when they transact their business. Therefore, there are a limited number of studies covering these industries. Our study addresses the hiatus in the literature to address such shortcomings in sustainability research. We have attempted to explore strategic

linkages between Corporate Sustainability Performance (CSP) and the firm's performance with respect to various dimensions of performance measures relative to the triple bottom line.

This study uses not only accounting-based measure of financial profitability like ROA, ROE, and ROI, but also market value, Tobin's Q, and Sustained Growth Rate (SGR) as dependent variables This allows us to see the impact of environmental performance more comprehensively. In particular, SGR is introduced to capture the financial growth potential of a firm. Further, the Pacific Sustainability Index (PSI) was used in the study as a new environmental performance measure in contrast to the previous studies which typically employ environmental performance measures only. We are convinced that the index will yield reliable results due to the dimensions incorporated in ascertaining the index.

Further, this study expanded the scope of research to include twelve different sectors of service industries. Exploring how these sectors perform in terms of their uniqueness in implementing sustainability practices will provide us with managerial insights on doing "good" in order to enhance the overall performance of a firm in these vital sectors of the service industry.

4. PROPOSITION

The relationship between a firm's Corporate Sustainability Performance (CSP) and their economic performance has been argued in various ways over the several decades. As stated in section #2, several studies have been inconclusive because of the ambiguity of the cause and effect relationship between a firm's Corporate Sustainability Performance (CSP) and its economics performance. It is not certain whether a higher level of CSP leads to better firm performance or better firm performance leads to a higher level of CSP. Further uncertainties creep due to the differences in the types of performance measures such as the difference between financial accounting performance and market based performance like stock return.

A higher level of CSP creates competitive advantage for an organization in the form of inimitable, invaluable, and rare goodwill (Lee, Pati, and Roh, 2011). Further, Hart (1995) and Russo and Fouts (1997) show that firms develop competence to innovate solutions in the course of implementing environmental strategies. These complementarity effects further create a positive cycle to foster a higher level of competitive advantages (Hart 1995; Russo & Fouts 1997). The basic framework of the research propositions is given in figure 1 below

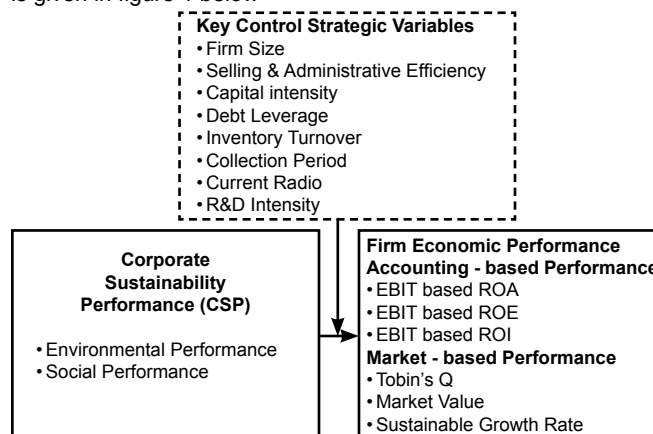


Figure 1. Linkage between the Corporate Sustainability Performance (CSP) and Economic Performance of a firm

Our conjecture is that CSP and firm's performance are positively correlated. A number of studies reported that enhanced brand reputation due to positive public image results in enhanced financial performance. Karpoff et al. (2005) reported that violation of environmental laws leads to litigation, penalty, damage awards, remediation, and consequently loss of goodwill, and hurts the organization's brand image. Conversely, good environmental stewardship shown by organizations receives enthusiastic support from their stakeholders. For example, Jacobs, et al. (2010) in their study of 430 announcements of environmental initiatives and 381 announcements of environmental awards and certifications, found that shareholders react positively to positive press on environmental performance.

Based upon the preceding discussions, we encapsulate our conjectures in the form of following hypotheses.

H1: Corporate Sustainability Performance (CSP) measured by the environmental PSI score is significantly and positively associated with a firm's economic performance regardless of performance measures employed in service oriented industries.

H2: Corporate Sustainability Performance (CSP) measured by the social PSI score is significantly and positively associated with a firm's economic performance regardless of performance measures employed in service-oriented industries.

H3: Corporate Sustainability Performance (CSP) measured by the composite of environmental- and social-PSI scores is significantly and positively associated with a firm's economic performance regardless of performance measures employed in service oriented industries.

H4: Environmental- PSI and Social- PSI are significantly and positively associated with the firm's economic performance regardless of performance measures employed when control is exercised for the firm size, selling & administrative cost efficiency, capital intensity, debt leverage ratio, inventory turnover, average collection period, current ratio, and R&D intensity in service oriented industries.

5. EMPIRICAL STUDY DESIGN AND METHODS

5.1 Samples and Data Collection

To begin with, the sample was drawn from the 2010 Corporate Environmental and Sustainability Reports by Roberts Environmental Center for service related industries. Initially, finance related firms were eliminated to maximize the generalizability and reliability of the study based on the primary SIC code. A total of 196 samples in 12 different service-oriented industries from 3 major country groups (US, EEC, and other country group) were selected based upon the availability of the Pacific Sustainability Index (PSI) for the purposes of the present study (see Table 1-A & B). Data for the performance variables and control variables employed in the study were extracted from the Compustat Research Insight Global Vantage and annual reports of the companies for the period 2006 through 2009 in order to match with the samples initially selected.

The Robert Environmental Center surveys and releases the Pacific sustainability Index (PSI) by different industry groups each year. Due to the reason that the samples could not be matched with respect to the corporate sustainability score during that period (i.e., missing values for some firms and years), we used the aggregated data across 12 different service industry groups for the period 2006 through 2009. This study also employs unique

individual sample data in an attempt to provide a more accurate assessment of the effect of the sustainability issues on various service industry sectors chosen. Further, this approach gives a more robust measure in exploring the impact of sustainability scores on a firm's performance for unmatched and inconsistent sample data.

5.2 Description and Measurement of Variables

5.2.1 Corporate Sustainability Performance

We used Pacific Sustainability Index (PSI) scores that capture the environmental and social characteristics of a firm. The PSI scores reflect an organization's environmental and socioeconomic performance as recorded in their voluntary environmental or sustainability report. PSI uses a base questionnaire for reports across sectors and a sector-specific questionnaire for companies within the same sector. The selection of questions was based upon the most frequently mentioned topics in over 900 corporate sustainability reports, periodically adjusted for the period 2002 through 2007 at the Roberts Environmental Center (ref.: www.roberts.mckenna.edu).

The Pacific Sustainability Index (PSI) criteria are decomposed into three attributes. (1) Environmental PSI score is assessed by accountability (3%), management (12%), vision and policy (12%), and resources utilization & emissions data (13%). (2) Social PSI score is assessed by accountability (3%), vision and policy (8%), management (8%), and labor issues (22%). (3) Human rights score is assessed by principles (18%). Furthermore, the overall PSI score is measured by the weighted scores of the following six categories: EI (Environmental Intent - 8%), ER (Environmental Reporting - 28%), EP (Environmental Performance - 19%), SI (Social Intent - 13%), SR (Social Reporting - 19%), and SP (Social Performance - 13%).

In this study, two sustainability scores were employed in a separate manner: Overall environmental and social PSI score was measured by the weighted score of intent, reporting, and performance. (1) Intent reflects vision, policies, and management strategies with respect to environmental and social attributes, (2) reporting considers the integrity in presentation of data on environmental and social reports, and (3) performance measures the performance of the reported environmental (EP) and social performance (SP) indicators. The scores are percentages of the total points possible in the Pacific Sustainability Index (ref.: www.roberts.mckenna.edu).

5.3 Firm Economic Performance

As highlighted in our discussions before, a majority of empirical studies investigated the impact of sustainability on performance mostly using accounting based performance measures. A reliable performance measure should embrace the past pattern as well as reflect the company's strategies for the future. Considering that accounting-based performance reflects past year's earnings and market-based measures of performance reflects the market's perceptions of future earnings as financial sources for sustainable growth, the two components of performance can be expected to do a superior job of capturing a firm's accomplishment (Lee et al., 2011). Our study considered various indices of performance measures, e.g., accounting-based performance, market-based performance, and



sustainable growth rate in order to gain more accurate results and to address shortcomings of previous research. This research also minimizes the impact of accounting variations across countries as it used earnings before interests and taxes (EBIT) rather than net income after tax. The definition of the terms below follow from the discussion in Lee, Pati, Roh (2011).

5.3.1 Accounting-based Performance

EBITROA: indicates the firm's ability to utilize its assets to create profit. = (Income before Extraordinary Items) / (Total assets)

EBITROE: indicates how well the firm is performing in its attempt to maximize shareholders' wealth based on the book value of shareholders' equity. = (Income before Extraordinary Items) / (Common shareholders' Equity)

EBITROI: indicates a company's efficiency at allocating the capital under its control to profitable investments. This indicator shows how well a company is using its capital to generate profits = (Income before Extraordinary Items - Dividends) / (Invested capital)

5.3.2 Market-based Performance

Tobin's Q: is a measure of the growth prospect of the firm and the returns from long-term or tangible assets.

= (Market value of shareholder's equity + Liquidating value of the firm's outstanding preferred stock + Book value of total debts) / (Book value of total assets)

Tobin's Q value below 1 indicates that the firm earns less than the required rate of return; one dollar invested in the firm's assets results in future cash flows whose present value is less than \$1. In contrast to stock return or accounting performance, Tobin's Q does not require risk adjustment as well as normalization. Tobin's Q was also used to reflect the investor's expectation about a firm's future oriented performance measures (Lang & Stulz 1994; Smith & Watts 1992; Miller 2004).

Market Value: is the amount for which a firm could be sold as an ongoing business in the marketplace. It also indicates the firm's power to generate positive cash flows in determining the value of the firm's financial securities. = $\ln(\text{Year end closing stock price}) * (\text{Common shares outstanding})$ Managers and investors are keenly interested in knowing the value of the firm from the perspective of the going-concern value rather than its liquidation value (i.e. amount of money that could be realized if an asset or a group of assets is sold separately from its operating organization).

Sustainable Growth Rate (SGR): is a measure of how much a firm can grow and finance from its internal sources without borrowing more money or issuing new stocks (i.e., maximum rate at which a company can grow revenue without having to invest new capital. For example, if a company earns a 10% return on equity, ROE, it can grow 10% simply by reinvesting all the earnings in new opportunities). = $\text{ROE} \times [1 - \text{dividend-payout ratio} (= \text{DPS}/\text{EPS})]$

In order to grow faster, the company would have to invest more capital than its own earning by using debt or equity financing (Tarrantino, 2004). In sum, the sustainable growth rate (SGR) indicates the maximum growth rate that a firm can sustain without increasing financial leverage.

5.4 Key Strategic Control Variables:

Since the research aimed to establish strategic links between corporate sustainability and firm performance, it was deemed necessary to maintain control for certain confounding variables that are important in service-oriented industries. The control

variables in this study are eight strategic control factors, namely firm size, selling & administrative efficiency, capital intensity, debt leverage, inventory turnover, average collection period, current ratio, and R&D intensity. (1) **Firm Size** is measured by the natural log value of total assets, (2) **Selling & Administrative** efficiency which represents the marketing and administrative efficiency which is measured by the ratio of the selling & administrative expenses to the total sales, (3) **Capital intensity** is measured by the ratio of the net amount of plant & equipment to the total assets, (4) **Debt Leverage** is measured by the ratio of total debts to shareholders' equity, (5) **Inventory Turnover** is a ratio showing how many times a company's inventory is sold and replaced over a period and is measured by the ratio of cost of goods sold to average inventory, (6) **Average Collection Period** which indicates the approximate amount to time it takes for a firm to receive payments owed from its customers and clients, and is measured by the product of total amount of days and average amount of account receivables to total amount of net credit sales during period, (7) **Current ratio** (or liquidity ratio) measures a company's average ability to pay back its short-term obligations (i.e., the higher the current ratio, the more capable the company is to pay its obligation) and is measured by the current assets to current liabilities, (8) **R&D intensity** has been widely accepted in the technology and sustainability literature (Ito & Pucik 1993; Lee & Habte-Giorgis 2004; Markides 1995; McWilliams & Siegel 2000). The barometer of gauging a firm's technological and innovative capabilities is the extent to which the firm invests in research and development. R&D intensity is computed as the ratio of book values of R&D expenditures to total sales (R&D Expenditure / Total Sales).

Furthermore, one country dummy variable (US firm vs. Other country group) was also employed to investigate the influence of the strategic links between the corporate sustainability and performance by different type of country groups in the sample. Each of these control variables were operationalized in the following manner:

Firm Size = Natural log value of Total Sales (US\$ based)

Selling & Administrative Efficiency = Selling & Administrative Expense / Total Sales

Capital Intensity = Total Assets / Total Sales

Debt Leverage = Book value of Total Debt / Shareholder's Equity
Inventory Turnover = Cost of Goods Sold / Average Inventory between t and t-1 time period

Average Collection Period = [(Account Receivables) * 360] / Total Sales

Current Ratio = Current Assets / Current Liabilities

R&D Intensity = R&D Expenditure / Total Sales

Country Dummy: US firm (1) vs. Non-US firms (0)

There were a plethora of variables identified in the study as important explanatory strategic variables in the context of service oriented industries. However, we decided to concentrate on more significant variables that would shed light on the unique characteristics of service oriented industries. We are convinced that the variables employed in this study are adequate to explore key strategic factors that affect a firm's performance in sustainability dimensions.

6. METHODOLOGY

In order to fully explore the strategic impact of the two different corporate sustainability indices, i.e., environmental and social, on the firm's economic performance in the leading service-

oriented industry, a series of hierarchical regression models were employed. All control variables were entered in the first step of the regression model as presented below. Individual effects of two corporate sustainability indices (environmental and social) and their joint effects on firm performance were separated from the variables being investigated to provide a more rigorous test of the key strategic variables. By eliminating the effects of the control variables in the beginning, it was possible to accurately assess the true impact of sustainability with respect to environmental and social-index on the firm performance. We used the dummy variables, 1 for U.S. service firms, and 0 for non-U.S. firms. The following three steps of the hierarchical regression model were used.

Performance (Accounting- and Market-based Performance) =
Step 1: Control variables: Country dummy, Firm size, Selling & Administrative efficiency, Debt leverage, Capital intensity, Average collection period, Current ratio, and R&D intensity
Step 2: Control variables: Environmental PSI score, Social PSI score
Step 3: Control variables: Environmental PSI score, Social PSI score, composite of Environmental PSI score and Social PSI score, Country dummy)

7. ANALYSIS AND DISCUSSION

7.1 Descriptive Statistics and Correlation Analysis

Table 1-(A) & (B) present an overall specification of the Pacific Sustainability Index (PSI) score with respect to environmental and social PSI scores by three major country groups (USA, EEC, and other countries). The PSI score indicates the relative levels of environmental and social intents, transparency, and performance.

The average PSI score was 23.92%, within the score range from 21.31% to 33.30% with the standard deviation of 15.22%. To put this score into perspective, the service-oriented industries in the US firm did not do very well relative to EEC or other country group. The U.S. based firms recorded the lowest average among the comparison groups, which is consistent with the scores observed in the context of Oil and Refinery industries (Lee, et al., 2011). Further, a higher score was observed in social issues (29.46%) when compared to the environmental score (13.55%) across the country groups. As shown in Table 1 (A), it also appears that the service oriented firms concentrate significantly on social issues (70.26%) with respect to corporate responsibility and reputation than environmental issues with emission and resources utilization (29.64%). The strategic drive toward social issues in service industries appear to be in contrast to the focus on environmental issues found in the manufacturing industries. With the exception of the hotel & resort industry this trend seems to remarkably consistent regardless of the sector (46.96% vs. 53.04% for environmental vs. social issues).

Descriptive statistics and inter-correlations for all other variables used in this study are presented in Table 2. We performed list-wise deletions to utilize the cases that had applicable values for all variables important to the analysis. The firm size, selling & administrative efficiency, capital intensity, and current ratio were relatively significant at 5% level of significance with respect to market-based performance including sustained growth rate (SGR). The inter-correlations between both environmental and social

Table 1 (A): Specification of the Pacific Sustainability Index (PSI) Score by Major Country Groups

Country	N	Environmental				Social				Overall PSI Score	Concentration	
		Intent	Recording	Performance	Overall	Intent	Recording	Performance	Overall		Environmt	Social
USA	148	30.33 (28.78)	7.24 (10.14)	1.58 (3.85)	10.77 (11.49)	31.16 (20.82)	28.59 (17.81)	20.18 (13.75)	26.92 (16.42)	21.31 (14.07)	26.95 (22.08)	72.84 (22.22)
EEC	35	55.09 (24.81)	15.72 (12.01)	3.51 (4.99)	20.28 (11.55)	51.38 (25.24)	39.86 (18.04)	26.72 (14.41)	38.19 (17.11)	31.56 (13.53)	37.64 (13.05)	62.64 (13.10)
OTHER	13	65.61 (33.24)	22.04 (21.00)	3.66 (4.28)	25.89 (18.85)	49.77 (27.28)	37.20 (21.00)	26.61 (16.18)	36.32 (19.10)	33.30 (19.92)	38.95 (13.86)	61.05 (13.86)
Total	196	37.20 (31.07)	9.83 (12.60)	2.06 (4.15)	13.55 (13.23)	35.88 (23.57)	31.06 (18.58)	21.74 (14.27)	29.46 (17.29)	23.92 (15.22)	29.64 (20.83)	70.26 (20.91)

Special Note:

1. Environmental Intent covers scores of accountability, management, policy, and vision.
2. Environmental Reporting covers emissions to air, emission to water, energy, management, materials usage, recycling, waste, water
3. Social Intents cover the scores of accountability, management, policy, social demographic, and vision.
4. Social Reporting covers the scores of human rights, management, qualitative social, and quantitative social
5. Performance scores are calculated in both environmental and social reporting category when data are better than peer average, taking a leadership position for the sector, and at its maximum performance.
6. Concentration Ratio indicates the distribution of scores by environmental and social scores
7. The value in parentheses indicates standard deviation.

The Pacific Sustainability Index(PSI) was developed at the Roberts Environmental Center at Claremont McKenna College in California, for the purpose of scoring corporate environmental and sustainability reports . It was introduced in 2002 in the book "Clean Green and Read All Over: Ten Rules for Effective Environmental and Sustainability Reporting." published by the American Society for Quality Press, in which it is described in some detail. Referece: <http://www.roberts.cmc.edu/PSI>



Table 1(B): Specification of the Pacific Sustainability Index (PSI) Score by Industry Groups

Industry	N	Environmental				Social				Overall	Concentration	
		Intent	Recording	Performance	Overall	Intent	Recording	Performance	Overall	PSI Score	Environment	Social
Airlines	14	40.01 (28.85)	14.26 (10.92)	2.72 (3.21)	15.36 (10.95)	42.86 (24.08)	37.77 (15.17)	25.88 (10.97)	35.47 (14.32)	26.62 (11.55)	32.60 (14.38)	68.34 (14.26)
Gas, Electric, Utilities	64	58.82 (28.10)	16.96 (15.15)	4.11 (5.49)	21.52 (14.52)	45.11 (23.72)	36.78 (16.47)	25.09 (12.71)	35.06 (15.60)	29.95 (15.42)	41.08 (14.06)	59.04 (14.11)
Entertainments	18	24.42 (24.77)	3.35 (5.89)	0.00 (0.00)	8.18 (9.77)	27.56 (22.99)	29.25 (20.25)	21.25 (14.01)	27.10 (18.52)	21.44 (15.25)	21.30 (19.76)	78.70 (19.76)
Food & Drug Stores	16	33.06 (27.60)	7.27 (9.48)	0.85 (2.47)	12.32 (11.54)	30.29 (22.07)	27.32 (16.33)	19.84 (13.11)	25.89 (15.79)	22.98 (14.67)	29.93 (19.62)	67.58 (21.28)
Food Services	17	26.53 (24.40)	6.93 (10.40)	0.20 (0.84)	9.64 (10.57)	32.16 (15.83)	37.32 (17.51)	26.60 (14.48)	33.93 (15.74)	25.86 (12.78)	19.96 (17.46)	80.04 (17.46)
General Merchandises	16	25.48 (33.67)	7.17 (9.83)	2.71 (5.05)	9.76 (13.05)	28.97 (23.89)	31.11 (15.87)	23.74 (13.50)	28.99 (15.14)	23.18 (13.92)	17.54 (18.93)	82.48 (18.91)
Health Care service	10	11.23 (13.25)	5.78 (10.49)	1.46 (3.33)	6.69 (9.64)	33.14 (20.91)	19.60 (18.38)	12.68 (15.12)	20.03 (17.28)	16.06 (15.11)	14.67 (12.05)	85.33 (12.05)
Internet services & Retailing	6	9.68 (13.38)	0.61 (1.49)	0.00 (0.00)	3.42 (4.24)	8.12 (13.80)	7.32 (8.84)	5.98 (9.65)	7.13 (9.76)	6.06 (7.93)	43.82 (45.79)	56.18 (45.79)
Mail, Freight & Shipping	6	59.62 (12.34)	14.22 (10.03)	1.33 (2.42)	16.89 (7.39)	46.15 (25.28)	43.33 (21.38)	28.47 (18.80)	40.04 (19.63)	28.11 (12.79)	41.20 (8.88)	58.80 (8.88)
Retail & Wholesales	13	19.61 (20.43)	1.64 (3.53)	1.03 (2.85)	6.29 (7.48)	32.28 (23.17)	26.57 (21.79)	18.16 (18.44)	25.52 (20.71)	18.64 (15.57)	17.24 (16.32)	82.76 (16.32)
Electronics & Office Equipments	11	9.05 (17.80)	0.00 (0.00)	0.00 (0.00)	3.05 (7.06)	25.15 (15.35)	11.17 (11.04)	8.13 (9.12)	12.43 (10.35)	9.08 (8.93)	10.43 (13.46)	89.57 (13.46)
Transportation, Hotel & Resort.	5	36.85 (26.25)	6.98 (9.54)	0.00 (0.00)	13.30 (10.60)	37.44 (31.33)	24.05 (15.75)	17.49 (11.55)	24.32 (14.87)	21.81 (13.29)	46.96 (31.23)	53.04 (31.23)
Total	196	37.20 (31.07)	9.83 (12.60)	2.06 (4.15)	13.55 (13.23)	35.88 (23.57)	31.06 (18.58)	21.74 (14.27)	29.46 (17.29)	23.92 (15.22)	29.64 (20.83)	70.26 (20.91)

Special Note:

1. Environmental Intent covers scores of accountability, management, policy, and vision.
2. Environmental Reporting covers emissions to air, emission to water, energy, management, materials usage, recycling, waste, water
3. Social Intents covers the scores of accountability, management, policy, social demographic, and vision.
4. Social Reporting covers the scores of human rights, management, qualitative social, and quantitative social
5. Performance scores are calculated in both environmental and social reporting category when data are better than peer average, taking a leadership position for the sector, and at its maximum performance.
6. Concentration Ratio indicates the distribution of scores by environmental and social scores
7. The value in parentheses indicates standard deviation.

Table 2: Specification of The Pacific Sustainability Index (PSI) Score by Industry Groups

	Variables	Mean	Std. Dev	1.00	2.00	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Dummy: US vs. Otherb	0.75	0.42																	
2	EBITROA	0.09	0.08	.06																
3	EBITROE	0.33	0.85	.02	.26***															
4	EBITROI	0.15	0.15	.16*	.90***	.29***														
5	Tobin's Q	1.46	0.56	-.13+	.39***	.05	.37***													
6	Market Value	8.55	1.84	-.18*	.10	.07	.01	.31***												
7	Sustained Growth Rate	9.45	5.07	-.26***	.06	.00	.07	.37***	.44***											
8	Firm Size: Ln (Sales)	9.02	1.44	.15*	.17*	.16*	.17*	.28***	.23***	.27***										
9	Selling & Admin. Intensity	0.17	0.13	.30***	-.15*	-.16*	-.021**	.17*	.22**	.19*	.21**									
10	Capital Intensity	1.56	1.28	-.01	-.06	.01	.15*	.15*	.20**	.16*	.28***	.02								
11	Debt Leverage	2.89	12.77	.01	-.08	-.33***	-.04	-.02	.08	-.01	.10	-.08	.03							
12	Inventory Turnover	29.80	46.63	-.01	-.04	.01	-.03	.06	-.09	-.01	-.04	-.30***	-.04	.05						
13	Average Collection Period	41.83	49.75	.23***	-.19**	-.01	.01	.00	-.10	.15*	-.19**	-.05	.26***	-.02	-.07					
14	Current Ratio	1.32	0.75	.24***	.26***	.15*	.18*	.20**	.31***	.20**	.17**	.37***	-.12	-.07	-.20*	-.03				
15	R&D Intensity	.02	.04	.04	.20	-.08	.03	-.14	-.03	-.20	.02	.31***	.38***	-.05	-.13	.10	.25***			
16	Environment PSI Scorec	14.02	14.14	.36***	.14*	-.01	.18*	.28***	.28***	.29***	.39***	-.28***	.32***	.04	-.08	.09	-.32***	.14+		
17	Social PSI Score d	31.02	18.73	.26***	.19**	.00	.21**	.35***	.31***	.28***	.37***	-.27***	.16*	.16*	-.02	.01	-.32***	.23**	.68***	
18	Env. PSI x Soc. PSLe	638	849	.31***	-.07	-.01	.24**	.29***	.28***	.30***	.39***	-.27***	.24***	.14+	-.05	.04	-.34***	.22**	.76***	.78***

^a n = 196. + P < 0.10; * P < 0.05; ** P < 0.01; *** P < 0.001

^b Dummy Variables for USA (1) vs. Other country group

^c Overall environmental PSI score with respect to accountability, management, vision and policy, resources utilization & emissions data.

^d Overall Social PSI Score with respect to accountability, vision and policy, Management, and Labor issues

^e Composite= (Environmental PSI score X Social PSI score)



Table3: Results of Hierarchical Regression Analysis for Accounting-based Performance ^a

Variables	EBITROA (EBIT/ASSET)						EBITROE (EBIT/EQUITY)						EBITROI (EBIT/INVESTMENT)					
	Step 1		Step 2		Step 3		Step 1		Step 2		Step 3		Step 1		Step 2		Step 3	
(Constant)	.133	(.04)**	.123	(.04)**	.129	(.04)**	.302	(.16)*	.263	(.17)	.275	(.17)	.285	(.08)**	.281	(.09)**	.288	(.09)
Dummy: USA vs. Otherb	-.015	(.04)	-.022	(.04)	-.005	(.04)	-.042	(.15)	-.022	(.02)	-.019	(.02)	-.067	(.08)	-.074	(.08)	-.059	(.08)
Firm Size (Ln Sale)	.014	(.00)*	.012	(.00)*	.013	(.00)*	-.020	(.02)	-.012	(.02)	-.010	(.02)	.013	(.01)*	.016	(.01)*	.015	(.01)*
Selling & Adm. Intensity	.206	(.09)**	.206	(.08)**	.245	(.09)**	.359	(.27)*	.324	(.22)*	.309	(.23)*	.226	(.11)*	.243	(.11)**	.263	(.11)**
Capital Intensity	-.003	(.00)	-.001	(.00)	-.001	(.00)	-.012	(.02)	-.005	(.02)	-.002	(.02)	-.019	(.01)*	-.020	(.01)*	-.019	(.01)
Dept Leverage	.000	(.00)	.000	(.00)	.000	(.00)	-.063	(.00)**	-.063	(.00)**	-.063	(.00)**	.001	(.00)	.001	(.00)	.001	(.00)
Inventory Turnover	.000	(.00)	.000	(.00)	.000	(.00)	.000	(.00)	-.001	(.00)	-.001	(.00)	.000	(.00)	.000	(.00)	.000	(.00)
Avg. Collection Period	.000	(.00)**	.000	(.00)**	.000	(.00)**	.000	(.00)	.000	(.00)	.000	(.00)	.000	(.00)	.000	(.00)	.000	(.00)
Current Ratio	.024	(.01)**	.024	(.01)**	.022	(.01)*	.011	(.05)*	.012	(.06)*	.012	(.06)*	.060	(.02)**	.070	(.02)**	.050	(.02)**
R&D Intensity	.368	(.25)	.388	(.25)	.389	(.25)	-1.03	(.98)	-1.16	(.99)	-1.20	(1.0)	.212	(.49)	.298	(.49)	.292	(.50)
Environmental PSI Scorec			-.001	(.00)	-.002	(.00)*			-.002	(.00)	-.006	(.01)			-.001	(.00)	-.003	(.00)
Social PSI Scored			.013	(.06)*	.015	(.08)*			.000	(.00)	.000	(.01)			.011	(.06)*	.015	(.07)**
Env PSI x Soc PSLe					.001	(.00)					.001	(.01)					.011	(.05)**
Model R2	0.1879		0.2018		0.2342		0.2012		0.2125		0.2203		0.2197		0.2385		0.2754	
Adjusted R2	0.1798		0.1856		0.2013		0.1876		0.1892		0.1896		0.1986		0.2034		0.2045	
Δ in R2			0.0139*		0.0324**				0.0113		0.0078				0.0188*		0.0369**	
F-Ratio	2.5238*		3.7856**		3.5863**		13.7326***		12.2821***		15.8573***		12.859***		18.0671***		19.7583***	
F-Ratio for Δ in R2			0.5423		1.3521				0.4523		0.3245				4.5832		4.7832	

^a n=196. Unstandardized regression coefficients, with standard errors in parentheses, are shown.

^b Dummy Variables for USA (1) vs. Other country group

^c Overall environmental PSI score with respect to accountability, management, vision and policy, resources utilization & emissions data.

^d Overall Social PSI Score with respect to accountability, vision and policy, Management, and Labor issues

^e Composite= (Environmental PSI score X Social PSI score)

+ P < 0.10; * P < 0.05; ** P < 0.01; *** P < 0.001

Table4: Results of Hierarchical Regression Analysis for Market-based Performance ^a

Variables	Tobin's Q						Market Value						Sustained Growth					
	Step 1		Step 2		Step 3		Step 1		Step 2		Step 3		Step 1		Step 2		Step 3	
(Constant)	1.09	(.30)***	1.21	(.29)***	1.24	(.29)***	1.66	(.69)*	1.45	(.66)*	1.41	(.66)*	4.01	(1.8)*	3.61	(1.8)*	4.22	(1.8)*
Dummy: USA vs. Otherb	-.134	(.28)	-.040	(.27)	.177	(.28)	.565	(.64)	1.10	(.61)*	1.31	(.63)*	-.067	(.08)	-.074	(.08)	-.059	(.08)
Firm Size (Ln Sale)	.536	(.03)***	.425	(.03)***	.385	(.03)***	.832	(.07)***	.671	(.07)***	.654	(.07)***	1.03	(.25)***	.678	(.19)***	.687	(1.8)***
Selling & Adm. Intensity	.080	(.40)	.326	(.37)	.186	(.37)	-.437	(.91)	-.400	(.85)	-.443	(.86)	.520	(.21)**	.432	(.23)*	.456	(.29)*
Capital Intensity	.026	(.03)	-.010	(.03)	-.017	(.03)	.410	(.07)***	.285	(.07)***	.265	(.07)***	.570	(.28)*	-.325	(.21)	-.356	(.18)*
Debt Leverage	-.002	(.00)*	-.002	(.00)*	-.002	(.00)*	.000	(.01)	-.001	(.01)	-.000	(.01)	-.014	(.03)	-.011	(.02)	-.006	(.02)
Inventory Turnover	.001	(.00)	.001	(.00)	.001	(.00)	-.003	(.00)	-.003	(.00)	-.003	(.00)	.004	(.01)	.009	(.01)	.008	(.01)
Avg. Collection Period	.000	(.00)	.000	(.00)	.000	(.00)	-.002	(.00)	-.002	(.00)	-.002	(.00)	.150	(.07)*	.123	(.06)*	.162	(.08)*
Current Ratio	.037	(.18)*	.044	(.03)*	.053	(.03)*	.290	(.13)*	.291	(.13)*	.268	(.14)*	.542	(.38)	.554	(.37)	.339	(.37)
R&D Intensity	2.78	(1.7)	1.27	(1.6)	.738	(1.6)	1.68	(2.0)	1.42	(3.8)	-.603	(3.8)	3.96	(2.3)*	2.68	(1.8)*	2.18	(1.3)*
Environmental PSI Scorec			.002	(.00)*	.030	(.01)**			.016	(.01)*	.024	(.01)**			.140	(.03)***	-.128	(.06)**
Social PSI Scored			.014	(.00)***	.007	(.00)**			.021	(.01)**	.009	(.00)**			.120	(.02)***	.380	(.09)***
Env PSI x Soc PSLe					.036	(.01)*					.045	(.02)**					.044	(.00)***
Model R2	0.2171		0.2516		0.3112		0.2368		0.3124		0.3203		0.2385		0.2798		0.3237	
Adjusted R2	0.2004		0.2385		0.2752		0.2183		0.2896		0.2912		0.1986		0.2534		0.3102	
Δ in R2			0.0345**		0.0596***				0.0375**		0.0423**				0.0413**		0.0513***	
F-Ratio	4.5238***		4.7856***		4.5863***		31.7326***		33.2821***		34.8573***		12.859***		19.0671***		19.7583***	
F-Ratio for Δ in R2			3.5423		4.1321				10.5236		8.5231				12.9551		14.3985	

^a n=196. Unstandardized regression coefficients, with standard errors in parentheses, are shown.

^b Dummy Variables for USA (1) vs. Other country group

^c Overall environmental PSI score with respect to accountability, management, vision and policy, resources utilization & emissions data.

^d Overall Social PSI Score with respect to accountability, vision and policy, Management, and Labor issues

^e Composite = (Environmental PSI score X Social PSI score)

+ P < 0.10; * P < 0.05; ** P < 0.01; *** P < 0.001



PSI score and firm performance, except EBITROE, reveal strong and consistent relationships. This suggests that enhancement in sustainability efforts (CSP) is helpful in explaining the firm performance, particularly the market-based performance including sustainable growth rate (SGR). In fact, both environmental and social PSI scores were significantly ($P < 0.01$) and positively correlated with all market-based performance. There seems to be a direct relationship between a firm's sustainable growth and the extent to which the firm is engaged in addressing environmental and/or social issues. These two different corporate sustainability factors are not uniformly significant with respect to accounting-based performance such as with EBITROE. More significantly, the composite of environmental and social PSI scores is also highly and significantly related to most market-based performance ($p < 0.001$) but significant with EBITROE of accounting-based performance.

As expected, firm size, selling & administrative efficiency, and current ratio are positively correlated with most indices of performance measures while average collection period is significant with respect to accounting-based performance. Contrary to the result of previous studies with manufacturing industries (Holtzman 2008), and Oil & Gas Industry (Lee et al., 2011), variables like capital intensity and R&D intensity were not found to be significantly related to the firm performance in service industries. These findings do not seem to be consistent with the traditional notion that a higher level of technology development through R&D intensity is critical to the firm's market-based performance and sustainable growth (Holtzman 2008; Lee & Habte-Giorgis 2004). This is intuitive in a customer oriented industry sector which emphasizes the image and social responsibility to build corporate sustainability. Besides capital intensity and R&D intensity, other control variables such as the firm size, selling & administrative efficiency, and current ratio were significantly and positively correlated with sustainability PSI score and with most performance measures. Sales promotion strategy by credit sales is also significantly and positively related with accounting-based performance in exception with only EBITROI.

Thus, the impact of the PSI scores on performance seems to vary depending on the performance measures under consideration. The environmental and social PSI scores, firm size, selling & administrative efficiency as a proxy for internal resources operation, current ratio as the firm's ability to pay off its short-term financial liabilities tend to be significantly and positively correlated with the firm's economic performance relative to accounting- and market-based performance, particularly, with respect to market-based performance. Contrary to our expectation, debt leverage and inventory turnover, and R&D intensity are not significantly correlated with any of performance measures except for debt leverage relative to EBITROE.

7.2 Results of Hierarchical Regression Analysis

In this study, we considered a set of variables simultaneously. Thus, simple inter-correlation results do not always imply the importance of a variable. To prevent multi-collinearity problems that may skew the correct interpretation of a multiple regression model with interaction effects, we centered both environmental and social sustainability PSI scores and also separated possible potential factors, i.e., interaction factor of environmental- and social- PSI score (Aiken & West, 1991; Hair et al., 2010). By following the procedure, we prevented the multi-collinearity problem as all the Variance Inflation Factors (VIFs) were below 2.97—well below the threshold value of 10.

The empirical models shown previously were estimated separately with respect to two major dimensions of the firm's economic performance and various indices of performance using the hierarchical multiple regression analysis. As presented in Tables 3 and 4, hierarchical regression was used to empirically explore the relative significance of environmental PS score, social PSI score and composite of two sustainability PSI scores on a firm's various indices of performance, after controlling for all moderating strategic variables and the sustainability score in a separate and simultaneous step of the model. All regression results were statistically significant ($p < .01$), indicating that the multiple regression models were useful for explaining the simultaneous effects of sustainability scores (both environmental and social focuses) on the firm performance, particularly with respect to market-based performance. This indicates the existence of a positive effect of corporate sustainability efforts on the firm performance. Further, the results support the argument that the improvement in a firm's environmental and social sustainability focus (or performance) will lead to improving the firm's market-based performance when other key strategic factors are held constant in the service-oriented industry across the country groups included in the study.

Table 3 presents the hierarchical regression results for models predicting accounting-based performance from the internal and relatively short-term profit perspective. Key strategic control variables accounted for approximately 20 percent of the variance in accounting performance like EBITROA, EBITROE, and EBITROI. Further, the corporate sustainability performance is not uniformly significant in determining a firm's performance. The social PSI score appears to be a significant determinant of accounting-based performance except for EBITROE whereas the environmental PSI score is minimally significant ($P < 0.10$) to explain EBITROA. The composite of both environmental and social PSI scores also appears to be a significant determinant for EBITROI after controlling for all other strategic factors including environmental and social performance.

Additionally, the coefficient of selling & administrative efficiency is negative but highly significant ($p < 0.001$) in EBITROA and is uniformly linked to all accounting performance measures at a 5% level of significance. The results support the importance of selling and administrative cost efficiency in service-oriented industries. The results indicate that the firms with more efficient operations in marketing and administrative system outperform those without adequate efficiencies in sustainability scores. It is intuitive as some of the efficiencies in marketing and administration are derived from going "paperless" and re-using and recycling consumables such as printer cartridges and printer papers. Further, strategic control variables like firm size, average collection period and current ratio are also significant predictors ($p < 0.05$) of a firm's accounting-based performance. However, average collection period is significant with respect to only EBITROA. Other strategic variables like R&D intensity, capital intensity and inventory turnover were not found to be statistically significant in determining performance measures contrary to our expectations. Additionally, debt leverage turned out to be highly significant ($p < 0.001$) in terms of EBITROE.

Table 4 presents the hierarchical regression results for models predicting market-based performance including sustainable growth rate (SGR). Once again, the strategic control variables accounted for nearly 21 to 31 percent of the variance in market-based performance, i.e., market value, Tobin's Q, and SGR. As explored through hierarchical regression analysis, both environmental

and social performance and focuses are uniformly significant ($p < 0.01$) in explaining the three market-based performance indicators (Tobin's Q, Market Value, and Sustained Growth Rate). The composite of environmental and social PSI scores also did well with respect to market based performance. This result is consistent with one of the recent studies in which the corporate sustainability performance measured in terms of the PSI score was inferred to be a powerful surrogate for market performance (Lee, Pati, and Roh, 2011)

In addition to the corporate sustainability performance indicated by the environmental and social-PSI score, other key strategic factors were found not to be uniformly significant and good predictors of market-based performance. For instance, capital intensity predicted market value and sustained growth, selling & administrative intensity predicted sustained growth, debt leverage predicted Tobin's Q, and average collection period and R&D intensity predicted sustained growth rate. Additionally, inventory turnover contributes insignificantly to market-based performance, and debt leverage contributes significantly ($P < 0.05$) to Tobin's Q only but is negatively linked to the market value. This result lends support to the notion that firms can sustain and maintain a target capital structure without having to increase financial leverage. The findings of the present study suggest that R&D does not seem to be a vital factor to improve the firm performance in service industries. Therefore, the effect of R&D intensity in determining the firm profit and market growth, even after controlling all other strategic variables, was not found to be significant. This finding is diametrically opposite to manufacturing industries in which R&D intensity was recognized as one of the most robust determinants of a firm's market performance and SGR (Holtzman, 2008; Kafuouros, 2005; Lee, et al., 2011).

There was a strong evidence of a direct relationship between the environmental and social sustainability factors in the Pacific Sustainability Index and market performance (Table 4). The addition of the PSI scores accounted for an additional 3 to 5 percent of the variances in all indices of market-based performance measures. Furthermore, the coefficient for the social PSI score was highly significant and positive for all performance measures ($p < 0.001$). Although there is not a great deal of empirical evidence to suggest a direct link between the PSI and market performance (Hillman & Keim 2001; Judge & Douglas 1998), the strategic drive for environmental and corporate social performance can be important in improving a firm's market value and growth in service-oriented industries across different countries.

Except for the market value, the location of the countries did not exhibit a significant impact on corporate sustainability performance (CSP) measured in terms of environmental and social PSI scores. Although the U.S. firms in this study are significantly large (148 out of 196), the marginal values of sustainability performance in the U.S. service firms were not found to be significantly different from that of non-U.S. firms. Thus, the overall corporate sustainability performance (CSP) in relation to firm performance in service industries, even after controlling selected strategic variables, was observed not to be significantly different between the U.S. and non-U.S. countries.

8. CONCLUSIONS AND IMPLICATIONS

This empirical study was designed to study the strategic impact of the corporate sustainability efforts on a service firm's economic performance. The study used the Pacific Sustainability Index (PSI) data published by the Roberts Environmental Center. The

study investigated the effect of environmental and social performance of a firm on the firm's overall performance measured by both accounting-based and market-based results in service industries across countries. This study examined the directions and magnitudes of operational relationships between the service firm's performance and two dimensions of the corporate sustainability measures—environmental and social—after controlling the key strategic factors that are essential to service related businesses. Utilizing a step-wise hierarchical regression analysis, the study explored the nature of the firm's economic performance with respect to accounting performance (EBITROA, EBITROE, and EBITROI) and market-based performance (Tobin's Q, market value, and sustained growth rate). Although the research focused on identifying the significant relationships between the corporate sustainability efforts measured in terms of environmental and social PSI and firm performance, it also explored how other strategic factors, such as firm size, selling & administrative cost efficiency, capital intensity, debt leverage, inventory turnover, average collection period, current ratio, and R&D intensity are linked to the firm's economic performance.

The study indicates that both environmental and social performance can be viewed as major significant and competitive determinants for improving a firm's performance operating in a service oriented industry. The accounting-based performance appears to be significantly linked to the social PSI scores which is a proxy measure for the corporate social responsibility and reputation in service industries. This is particularly true with respect to market based performance across the countries included in the sample. Furthermore, the effect of the composite of both environmental and social performance scores on a firm's performance is also remarkably significant. This is particularly true of market-based performance.

This empirical study is limited by its design such as the sample size. Although our intent was to include almost equal number of U.S. and non-U.S. firms, we were limited by the data set provided by PSI. The sample contained 148 U.S. service firms as compared to only 48 non-U.S. service firms. There were 12 sectors of service businesses represented in the study. However, some of the prominent sectors such as banking, finance, insurance were conspicuously absent. Another major limitation is the lack of consistent sampling over the time period of the study. The present study looked at relatively short-term data due to unavailability and inaccessibility of corporate sustainability scores consistently over a longer period of time. It was desirable to have a more extensive longitudinal database to establish substantive statistical relationships between the PSI scores and the firm performance.

As pointed out in our previous research relative to corporate sustainability and performance links (Lee et al., 2010), the major findings of this study will be of interest to decision makers employed by service industries. Since service industries occupy a significant part of our economy, it is imperative that they do "good" for the society. In so doing, they will garner goodwill from their stakeholders, enhance the reputation of their company, and build an inimitable brand. All these will add to their bottom line in the long run.



Although the service sector accounts for 2/3rd of the world economy, and 80 percent of the U.S. GDP (Spohrer et al., 2007), this sector has not been studied as thoroughly as its manufacturing counterpart. Particularly, this sector falls behind manufacturing industries in incorporating sustainability majors to create a competitive niche. Often, the managers in service industries perceive that profitability and sustainability focus are mutually exclusive. Some of the service industries included in this study, e.g., airlines, gas & electric utilities, entertainment, food and drugs stores, food services, general merchandise stores, health care service, internet services & retailing, mail, freight & shipping, retail and wholesale stores, electronic & office equipments, and transportation and hotel and resort are trend-setters in implementing sustainability measures while quite a few them lag the trend in embracing sustainability in their core strategy. Some of these industries sacrifice long term "good" in favor of instant gratification. Our research established that strong sustainability efforts, by and large, result in better economic and market performance. Hence, managers in service industries need to develop a sustainability mindset and invest in people and planet to generate profits. Contrary to the belief of managers in service industries, service operations in general leave a huge foot-print unless they are managed well. For example, a delivery truck in a package delivery company will leave a large carbon footprint if the company has gas guzzlers in their fleet. Imagine the number of such delivery trucks we see on the road everyday. In the hospitality industry segment, cruise ships produce huge amount of sewage, kitchen, bath, and laundry waste water, and tons of garbage each day. A well designed sustainability blue print to reduce waste and improve supply chain sustainability performance is not only a cost effective strategy but also is an earth-friendly strategy that ensures model corporate citizenship. Our study provides new operational insights into the strategic impact of the corporate sustainability efforts on a firm's economic performance so that the decision makers can gain advantage over their competition by employing some of the strategic factors explored in the research. Furthermore, the major findings of this study can also be re-tested and extrapolated to different industry settings like high-tech vs. low-tech industries. As opposed to the previous studies which correlated a simple combination of dependent and independent variables related to social issues in the manufacturing industries, this study used the simultaneous linear combinations of the corporate sustainability factors with multiple indices of the firm performance within 12 service industry sectors.

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