Relationship between Corporate Sustainability Performance and Tangible Business Performance: Evidence from Oil and Gas Industry

Jooh Lee[1] Niranjan Pati[2] James Jungbae Roh[3]

ABSTRACT

Sustainability has become an important domain for business researchers in the current decade due to the imperative that businesses must create values for their stockholders while simultaneously meet their social responsibilities in order to make a sustainable world. To this end, the current empirical study examined the impact of Corporate Sustainability Performance (CSP) on a firm's Tangible Business Performance (TBP) in the context of Oil and Gas industry due to their significant sustainability footprints. Using the data set called Pacific Sustainability Index (PSI), published by the Roberts Environmental Center, the research studied the direction and magnitude of relationships between key strategic factors. Hierarchical Regression Analysis was utilized to study the relationship between a firm's business performance with respect to various dimensions of accounting and marketing based performance as well as the sustained growth rate. The study also explored the relationships between TBP and several strategic factors such as the size of the firm, manufacturing cost efficiency, capital intensity, debt leverage, and labor productivity. The study concludes that PSI and Research and Development (R&D) Intensity are major determinants of business performance in the Oil and Gas Industries across countries.

Key Words: sustainability; business performance; hierarchical regression; Pacific sustainability Index (PSI)

JEL Classification: D63; G21

1. INTRODUCTION

Firms are facing increasing demands from their stakeholders to integrate their efforts in environmental, social, and economic realms to ensure a sustainable world. Oil and Gas industries, in particular, are vulnerable to such pressures due to the nature of their business. Two of the identifying characteristics of the oil and gas industries are depleted products used as inputs for many finished products and do not renew in a short time frame along with the activities of extraction of oil and gas which leave environmental and social footprints. The demands for these inputs are increasing as they are needed worldwide to improve the standards and quality of living of this generation. Unless these activities are properly managed, they can result in irreversible harm to the communities. A case in point is the recent oil spills in the Gulf of Mexico that not only damaged the ecosystem close to the drilling activity but also affected the livelihood of people that are reliant on the fishing and hospitality industries in New Orleans. There were quite a few instances that have brought oil and gas industries to their knees due to their mismanagement of resources.

The responsibility of a firm does not end at compliance to regulations and mandates, but to develop safeguards that will prevent disastrous events from occurring. The responsibility should also extend above and beyond to serve the current and future interests of the society. The notion of engaging beyond compliance is ethically desirable, albeit, it takes away resources from a firm's immediate needs. There are studies that argue that it is not at the best interest of shareholders that a firm spends resources beyond compliance (Friedman 1970; Walley & Whitehead 1994; Elgin 2007).

Today, scholars and practitioners wrestle with the question such as "Does green pay?" or "Does doing good benefit our shareholders?" Reported results in various fields, from finance to economics, are still inconclusive. Such inconclusive and inconsistent results infuse uncertainty in understanding the issues, making it difficult for managers to make the right decisions pertaining to their commitments to investments in the environment and other sustainability efforts. The act of balancing the financial returns of a corporation with a community's social wealth in which the corporation operates, defies the simplistic mathematical model of calculating efficiencies and rates of return. The importance of the research that advances theories and frameworks to develop in order to understand this conundrum should not be slighted.

2. LITERATURE REVIEW

The relationship between corporate social responsibility and a firm's economic performance has been studied in the past decade. Past studies have primarily focused on either financial accounting performance or market-based performance or both. The final results of these studies do not appear conclusive. Table 1 presents the summary of major selected studies that examined the links between corporate social responsibility (CSR) and the economic performance with respect to different dimensions of accounting and market-based performance.

Aragón-Correa and Rubio-López (2007) found no significant relationship between the total amount of organic carbon emitted and the firm performance such as Sales, ROI, and ROE in the context of the UK and France food industries. In a study of 523 US firms from Toxic Release Inventory (TRI) data, Cordeiro and Sarkis (1997) inferred that more recycling leads to worse earnings-per-share growth establishing a significant negative relationship between environmental pro-activism and earnings-per-share performance. The negative relationship between environmental and financial performance was supported in a study of 37 European paper industries (Wagner et al., 2002, and Wagner 2005). In a

[1]Jooh Lee - William G. Rohrer College of Business, Department of Management & Entrepreneurship,USA
[2]Niranjan Pati - Dean, Professor of Management & Entrepreneurship, William G. Rohrer College of Business,USA
[3]James Jungbae Roh - Department of Management & Entrepreneurship, William G. Rohrer College of Business, USA

study of 308 firms, Hillman and Keim (2001) used market value-added as the dependent variable and social issue participation as the independent variable and established that the environmental performance is adversely related to market value-capital. From the perspectives of the above studies, a greater investment in corporate sustainable development does not seem to have beneficial effects on the stockholder's gains and/or the firm's market value.

As stated before, Hillman and Keim (2001) used a new approach and divided the social corporate performance into two distinct components: stakeholder management and social issue participation. They hypothesized that while stakeholder management creates shareholder value, social issue participation decreases shareholder value creation. The rationale behind the negative association between social issue participation and shareholder value often involves the lack of the commitment of management to devote resources outside of the direct interest of the firm. After defining market value-added as the most appropriate shareholder value creation, their research concluded that the firm's strategy on the social issue of corporate sustainability does not contribute to the firm's economic performance. Although stakeholder management is positively related to market value-added, social issue participation is adversely related to market performance. 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.

Another study (Bansal, 2005) focused on 45 firms in Canadian oil and gas, mining, and forest industries from 1986 to 1995, found ROE to be negatively correlated to sustainable corporate development. This new research finding was not consistent with that of other studies (e.g., Klassen & McLaughlin, 1996; Russo & Fouts, 1997; Waddock & Graves, 1997) that established a positive relationship between environmental and firm performance. However, the result of the study underscores the lack of attention to the composite nature of other resource-based factors as well as deficiency of a single measure of corporate performance. Furthermore, this study suggests that social corporate development has become an imperative goal firms pursue regardless of financial condition and visibility.

The resources-based view of the firm argues that firms with a high corporate social responsibility (CSR) gain more competitive advantages than those with a low emphasis on CSR. One of the key strategic rationale for acquiring corporate sustainable capabilities and development is the substantive contributions they make to the firm's economic performance (Hart & Ahuja, 1996; Russo & Fouts, 1997; Waddock & Graves, 1997). In a resource-based theory for corporate sustainable development with respect to tangible (physical assets and raw materials) and intangible assets (reputation and image), Russo and Fouts (1997) focused on the economic effect of environmental performance. They found that environmental performance and economic performance are positively linked, even after controlling other strategic variables such as firm size, capital intensity, and firm and industry growth. Their regression results showed that firms with higher environmental ratings tend to yield higher ROA. They also found 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.

In a study of the strategic link between the corporate sustainability and the economic performance examined across 469 firms, Waddock and Graves (1997) lend support to the conjecture that measurement errors may confound the relationship between environmental and financial performance. Their purport was that corporate social performance cannott be portrayed by a single measure because of its multidimensional constructs relative to internal as well as external assets. Particularly, the effect of Corporate Social Performance (CSP) on the firm's economic performance may significantly vary depending on the choice made on the construct. They used the data compiled by KLD (Kinder, Lyndenbergh, & Domini)—a firm specializing in investment advising on social choice—that provides a multidimensional assessment measures with eight attributes of CSP. They inferred that CSP with multidimensional aspects is positively related to financial performance measures such as ROA, ROE, and Return on Sales (ROS). Edwards (1998) added support to this stream of relationship by showing a positive relationship between environmental and accounting performance measured in terms of ROE. The study concluded that "it does indeed pay to be green" and efforts to improve the environmental performance may enhances the firm's economic performance. Some of the other studies that found positive links between environmental and economics performance in the past are, Edwards (1998), Hart & Ahuja (1996), McGuire et al., (1988), and Wagner (2005). Particularly, Wagner (2005) demonstrated 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. Nevertheless, their connections between environmental and economic performance are not likely to be unique. Even for ROE and ROS as strategic criteria for corporate social responsibility, the firm's managerial strategy on environmental issues like pollution prevention seems to be more critical to improving performance.

McWilliams and Seigel (2000), in a study of 524 firms found the impact of corporate social performance on financial performance to be insignificant. This study was motivated by their conviction that a number of studies do not control for R&D intensity which is proven to have a significant impact on a firm's performance.

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 more closely related to corporate social responsibility than its subsequent performance over two different time periods. Although the firm with a high financial performance leads to more emphasis on the awareness of social responsibility, firms with a high social responsibility tend to be more successful in improving financial performance compared to firms without attention to the green strategy.

Most prior studies on the relationship between corporate social sustainability and corporate performance have been grounded on theoretical arguments. The researchers that asserted a negative effect of the social responsibility on corporate financial performance have the conviction that high level of commitments to social responsibility and green business issues demands more investments, thus leading to financial disadvantages. On the other hand, quite a few studies have argued in favor of a positive relationship

between sustainability and financial performance on the grounds that it improves employee and customer goodwill, creates economic benefit 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; Waddocks and Graves, 1997) by taking more social responsibility for environmental issues.

Quite different from the prior studies that have mainly explored the strategic effect of CSR on the firm's short-term accounting-based performance, some studies (Klassen & McLaughlin, 1996; Konar & Cohen, 2001) investigated the significance of CSR performance in the light of a broader spectrum of firm's market value with tangible and intangible assets. In fact, one of the reasons for inconclusive results on the study of corporate sustainability and performance indicators might be due to conflicting proxy of performance measures. Klassen and McLaughlin (1996) studied 14 manufacturing sectors to conclude that environmental management can play a positive role in improving the corporate financial performance. In exploring the linkages between environmental performance and financial performance with respect to the market value, Konar and Cohen (2001) 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 a high attention to their image promotion on environmental issues are likely to be rewarded in the marketplace for taking these actions.

3. SHORTCOMINGS OF PRIOR RESEARCH

The inconsistency surrounding the environmental initiatives and performance stems, in part, from incongruent approaches on defining Corporate Sustainability (CS) and Performance Indicators (PI). Further, designing research methodologies and constructs, and collecting and analyzing samples (Ambec & Lanoie 2008; Klassen & McLaughlin 1996; Konar & Cohen 2001) posed formidable challenges. Roman et al. (1999) reviewed 51 empirical studies and concluded that six studies used incorrect methodologies and seven studied invalid measures. After examining 139 publications, Orlitzky et al. (2003) concluded that sampling and measurement errors accounted for 40% of the aberration in the reported studies.

Table 1
Selected studies and their major findings on corporate social responsibility and Firm performance

Author(s) (date)	Relationship between environmental and firm performance (Sign)*	Research Methodology (sample)	Research Framework	
			Dependent variable (performance)	Independent variable (Environmental variable)
Hart & Ahuja (1996)	Positive impact (+)	Regression analysis (123 US firms)	ROE, ROA, ROS	The amount of emission reduction recorded in TRI
Russo & Fouts (1997)	Positive impact (+)	Regression analysis (243 US firms)	ROA	Environmental ratings expressed in FDRC, degree of compliance, expenditures, and reductions
Waddock & Graves (1997)	Significant positive impact (+)	Regression (469 firms)	ROA, ROE, ROS	Corporate social performance from Domini 400 social index
Cordeiro & Sarkis (1997)	Significant negative relationship (−)	Regression analysis (523 US firms)	Earnings-per-share growth forecast	The amount of recycled, treated materials from TRI
Edwards (1998)	Significant positive impact (+)	Comparison between groups	ROE	Environmental performance and management
McWilliams & Siegel (2000)	Neutral (n/a)	Regression analysis (524 firms)	Financial performance (accounting profits)	Corporate social performance from Domini 400 social index; R&D intensity as a control variable
Hillman & Keim (2001)	Significant negative impact (−)	Regression analysis (308 firms)	Market value-added (i.e., market value-capital)	Social issue participation from Domini 400 social index
Wagner et al. (2002)	Significant negative impact (−)	Simultaneous equation system (37 European firms in paper industry)	ROS, ROE, ROCE	Environmental index including SO2, NOX, and COD emissions)
Bansal (2005)	Significant negative impact (−)	Regression analysis (45 Canadian forestry, mining, oil and gas firms)	Sustainable corporate development	ROE
Wagner (2005)	Significant negative impact (−)	Panel regression analysis (37 European firms in paper industry)	ROS, ROE, ROCE	Environmental index including SO2, NOX, and COD emissions)
Aragón-Correa & Rubio-López (2007)	Neutral (n/a)	Correlation analysis (170 food factories in France and the UK)	Sales, ROI, ROE	Total organic carbon

*Note: + denotes positive, – negative, and n/a neutral pattern.

4. MOTIVATION AND SCOPE OF THE STUDY

Our research aims to address some of these shortcomings in extant literature by using a reliable social corporate performance indicator in the context of oil and gas industries. We chose oil and gas industries due to their tangible and intangible impacts on our environment and the society.

First, this study includes both market- and accounting-based performance measures as dependent variables. This study employs not only ROA, ROE and ROI but also market value, Tobin's Q, and Sustained Growth Rate (SGR) as dependent variables which allow us to see the impact of environmental performance more comprehensively. In particular, SGR is introduced as a more reliable measure that captures the financial growth potential of a firm without sacrificing its financial leverage.

Second, this study also introduces the Pacific Sustainability Index (PSI) as a new environmental performance measure for analysis. Previous studies typically derived environmental performance measures from databases such as Toxic Release Inventory or Domini's 400 Social Index. PSI covers not only pollution related aspects but also related social characteristics. We were convinced that PSI measures the environmental performance better than other indicators and would yield more accurate results in the study.

Third, this study narrows the scope of industries to crude-oil production and petroleum refining related industries. BP oil spills and a series of other mishaps recently have made the oil and gas industries vulnerable to public criticism in regard to the industry's sustainability strategies. Exploring how the industry scores in terms of its sustainability practices will provide us with managerial implications for executives employed in this vital sector of the economy.

Fourth, this study also explores the directions and magnitudes of the operational relationships between the key strategic factors, such as sustainability standards, R&D intensity to develop new products and new markets, and firm's economic performance with respect to broad aspects of accounting based performance measures such as OPROA (Income Before Extraordinary Items/ Total Assets), OPROE (Income Before Extraordinary Items/ Common Shareholders' Equity), OPROI ((Income Before Extraordinary Items-Dividends)/Invested Capital), and market-based performance (Tobin's Q, market value, SGR). Although the focus of this study was on the strategic linkages between the Corporate Sustainability Performance and Tangible Business Performance (TBP), it also explored how other strategic business factors, such as the firm size, manufacturing cost efficiency, capital intensity, debt leverage, and labor productivity are linked to the firm's economic performance. More specifically, this study (1) explored the existence of a diverse set of linkages between a select group of variables related to the industry and various indices of performance measures, and (2) determined the relative importance of business strategies (the PSI standards and R&D intensity), individually and jointly, for improving business performance in crude oil production and petroleum refining industries.

5. PROPOSITION

The relationship between the Corporate Sustainability Performance (CSP) and the Tangible Business Performance (TBP) in a corporation has been argued in various ways over the past decades. Several studies were inconclusive not only because of the ambiguity of the cause and effect relationship, i.e., whether CSP leads to TBP or TBP leads to CSP, but also due to differences in the types of performance measures (i.e., financial accounting performance and/or market based performance like stock return). In particular, our research pays more attention to the employment of the firm level performance measures in investigating the role of corporate social responsibility (McGuire et al., 1988; Worrell et al., 1991).

Sparing valuable resources in less immediate areas and environmental performance beyond a required level may be viewed as a stretch, and probably would not pique shareholders' interests. However, increasing CSP creates inimitable, invaluable and rare goodwill for the firm to exploit the market. In the context of CSP, Hart (1995) and Russo and Fouts (1997) show that firms develop intangible competence such as cross-functional integration, the capabilities to innovate solutions in the course of implementing pro-active environmental strategies. This complementarity further creates a greater basis for gaining competitive advantage (Hart 1995; Russo & Fouts 1997). Moreover, confirming that 'doing good' for the society means doing well for the firm might motivate companies to tackle social ills and rectify questionable tactics more actively. The basic framework relating our variables in the research proposition is given in figure 1. on pg 76

Tangible Business Performance (TBP)

- Accounting performance: ROS,ROE,ROI
- Market performance
- Market value
  -Tobin's q
  - Sustained Growth Rate
- Corporate Sustainability Performance (CSP)
- Environmental performance
- Social performance

Our conjecture is that CSP and TBP are positively correlated. Our conviction is based upon the theory that positive social performance improves the brand image. A number of studies reported that enhanced brand reputation results in enhanced financial performance. Today, sustainability performance is closely related with firm performance. For example, BP has experienced a serious fall in its profits after the massive oil spill and its market capitalization plummeted by $89 billion (The Economist, 2010). BP Gas Station owners have experienced their sales drop by 20% since the oil spill in the gulf coast (Sterrett 2010). Karpoff et al. (2005) report that violating environmental laws expressed in the fines, damage awards, and remediation costs the goodwill and reputation of a firm and causes the loss of its market value. On the contrary, in a study that examined 430 announcements of corporate environment initiatives and 381 announcements of environmental awards and certifications found that the shareholders positively react to positive environmental performance (Jacobs et al. 2010).

Second, positive social performance reduces unnecessary environmental costs. This rationale is similar to the quality cycle. As we know, achieving high quality is costly. However, when "quality" becomes the part of the organization's culture, it saves costs in rework, internal and external failures, warranty costs, product returns, litigations, etc. A higher level of quality eventually helps

firms to distinguish them from others, brings repeat customers, and increases the sales volume. Like quality cycle, achieving high social performance is costly in the short run. However, it helps firms to avoid environmental disasters, crisis and liability. It minimizes environmental wastes, inefficient processes, mitigation costs, etc. It maximizes energy utilization in the inbound and outbound logistics, prevents pollutions and litigations, and enhances productivity (Klassen & McLaughlin 1996; McGuire et al. 1988; Rothenberg et al. 2001).

Third, positive social performance creates new market opportunities. Due to the climate change phenomenon, customers are more aware of the importance of protecting the environment. They desire eco-friendly products and are willing to pay a premium for environmentally friendly products. Toyota was able to garner 70% of market share in the US hybrid car market due to its commitment to environment (Rowley, 2009). Investing in social performance can also create potential barriers to entry for the competitors via environmental standards or technologies. The US federal agencies also favor purchasing products that meet environmental standards, and have established policies that favor the vendors of sustainable products to conduct business transactions. (Dawson & Probert 2007; Min & Galle 2001).

Thus, we propose the following hypothesis

In a corporation, the Corporate Social Performance (CSP) is positively correlated with the Tangible Business Performance (TBP) when control is exercised for the firm size, R&D Intensity, debt leverage ratio, capital intensity, and labor productivity.

The independent variable of the hypothesis CSP is measured in terms of environmental and social performance. The dependent variable TBP is a composite measure of the accounting performance, (ROE, ROI, and ROS), market performance (market value and Tobin's q) and sustained growth rate (SGR).

6. STUDY DESIGN

6.1 Samples and Data Collection

The initial sample of the firms was drawn from the 2009 Corporate Environmental and Sustainability Reports by Roberts Environmental Center in Crude-Oil Production and Petroleum Refining related industries. A total of 95 firms from crude oil production (n=38, SIC=1311, 1321, 1381, 1382, 1389) and petroleum refining (n=57, SIC=2911) related industries were selected based upon the availability of the Pacific Sustainability Index (PSI) for the purposes of the present study. All other supporting data for the performance variables and control variables employed in the study were taken from the Compustat Research Insight Global Vantage and annual reports of the companies for the period 2006 through 2008 in order to match with the initially selected sustainability scores.

6.2 Description and Measurement of Variables

Due to the reason that the sample is a quasi-panel dataset and had missing values for some firms and years, we used the aggregated averages of all the variables tested in this study for the period 2006 through 2008. This study employs three-year data to help minimize the effect of any outliers and/or idiosyncratic variations (Bettis & Mahajan 1985) in an attempt to provide a more accurate assessment of the effect of the sustainability issues on the crude-oil production and petroleum refining sectors. Further, this approach gives a more robust measure in exploring the impact of sustainability scores on the firm performance.

6.3 Corporate Sustainability Performance

We used Pacific Sustainability Index (PSI) which encapsulates the environmental and social characteristics of a firm. The PSI scores reflect an organization's environmental and socioeconomic comprehensiveness (transparency) performance as expressed in their voluntary environmental or sustainability reports. PSI uses two systematic questionnaires to analyze the quality of the sustainability reporting - a base questionnaire for reports across

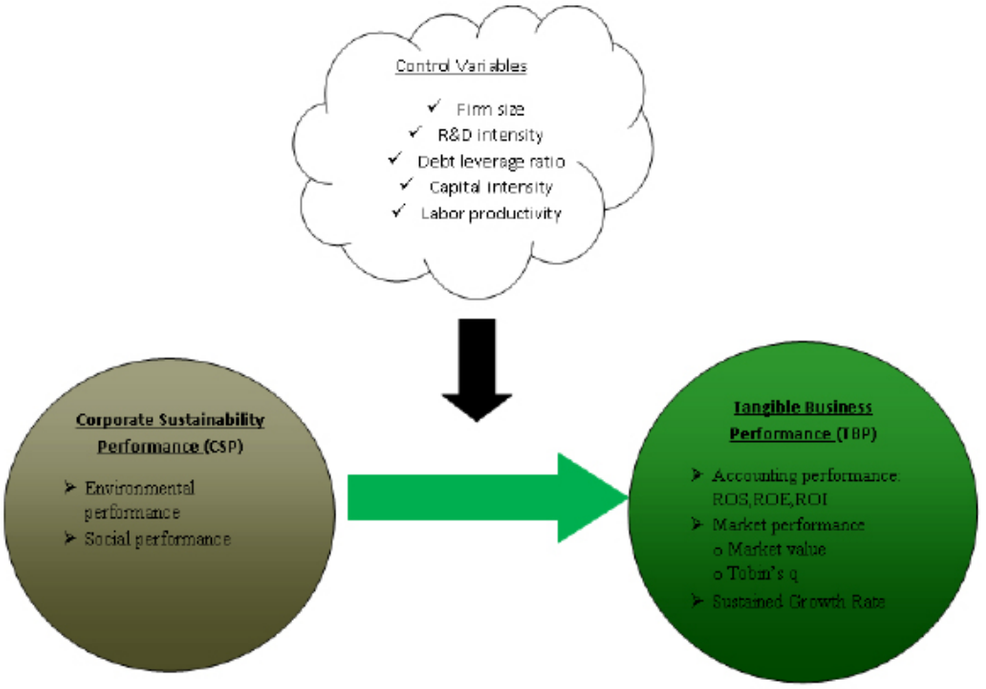

Figure 1. Linkage between the Corporate Sustainability Performance (CSP) and Tangible Business Performance (TBP)

sectors and a sector-specific questionnaire for companies within the same sector. The selection of questions for analysis 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.

The Pacific Sustainability reporting includes environmental and socioeconomic factors with respect to three major assessment criteria. (1) The Intent score which includes environmental intent (EI) and social intent (SI). These intents include vision, policies, and management strategies. For some industries, mitigation measures, goals, and procedures were included as well. (2) The Reporting score reflects the integrity in presentation of data on environmental reports (ER) and social reports (SR). (3) The Performance score measure the performance of the reported environmental performance (EP) and social performance (SP) indicators. Furthermore, the overall PSI was 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%). The scores are percentages of the total points possible in the Pacific Sustainability Index (ref.: www.roberts.mckenna.edu).

6.4 Tangible Business Performance

A majority of previous empirical studies investigating the impact of sustainability on performance mostly used a single measure, particularly, with respect to accounting-based performance. 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. Moreover, as noted in our literature survey, no study has attempted to empirically ascertain the linkage between sustainability and sustainable growth rate (SGR). Therefore, this 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 and generalized results, and to minimize possible weaknesses associated with the use of any single performance. Also, to minimize the impact of accounting variations across countries, this study used earnings before interests and taxes (EBIT) rather than net income after tax that is commonly employed in most global data settings.

Accounting-based Performance

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

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 (Year end closing stock price) * (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).
= ROE x [1 - dividend-payout ratio (=DPS / 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.

Key Strategic control Variables:

Research and Development (R&D) and export activities were employed as the two key strategic variables in this study: (1) R&D Intensity: The technological capability embodied in a firm is crucial to a firm's future performance, particularly with respect to expansion through export activities. The barometer to gauge the firm's technological and innovative capabilities is the extent to which the firm concentrates and 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). The measure of R&D intensity was selected because it has been widely accepted in the technology and sustainability related literature (Ito & Pucik 1993; Lee & Habte-Giorgis 2004; Markides 1995; McWilliams & Siegel 2000).

Firm size, manufacturing efficiency, capital intensity, debt leverage, and labor productivity were used as other Control variables.
(1) Firm Size: measured by the natural logarithm of total sales.

(2) Manufacturing Cost Efficiency: measured by Manufacturing or processing costs/Total sales revenues.
(3) Capital Intensity: measured by Total Assets / Total Sales.
(4) Debt Leverage: measured by Book value of Total Debt / Shareholder's Equity.
(5) Labor Productivity: measured by Sales (US$) / Number of Employees.

In addition, a dummy variable (oil production vs. petroleum refining) was employed to investigate the influence on the key strategic factors and performance by oil production and petroleum refining industry.
(6) Industry Dummy representation: Oil Production (0) vs. Petroleum Refining (1)

We were convinced that the variables employed are adequate to explore the nature of relationship between key strategic factors in the oil and petroleum refining industries for which the research was designed.

7. METHODOLOGY

A series of hierarchical regression models were employed to study the proposed hypothesis and analyze the relationships. As presented below, all control variables were entered in the first step of the regression model. In order to provide a more rigorous test of the key strategic variables under study, two strategic variables (R&D intensity and the PSI) and their individual effects on firm performance were separated from the variables being investigated. By eliminating the effects of the control variables first, it was possible to accurately assess the true impact of R&D intensity and the PSI on the various measures of firm performance. The following three steps of the hierarchical regression model were used that included the dummy variables, 0 for oil production and 1 for petroleum refining.

Performance (Accounting- and Market-based Performance) =
Step 1: Control variables (Industry dummy, Firm size, Manufacturing cost efficiency, Debt leverage, Capital intensity, Labor productivity)
Step 2: Control variables, R&D intensity
Step 3: Control variables, R&D Intensity, the PSI
where, Industry Dummy: Oil Production (0) vs. Petroleum Refining (1)

8. EMPIRICAL ANALYSIS AND DISCUSSION

8.1 Descriptive Statistics and Correlation Analysis

Table 2 presents overall specification of the Pacific Sustainability Index (PSI) score by seven major country groups (Asia, EEC, Europe, N. America, Oceania, USA and other countries). The numerical value of the PSI scores indicates the relative level of environmental and social intents, transparency, and performance. The average PSI score was 26.10%, within the score range from 0.94 to 62.14 with the standard deviation of 14.66. To put this score into perspective, the Oil Production and Petroleum Refining industries did not hold up very well relative to other industries. The U.S. based firms recorded the lowest average among the comparison groups. Further, a high variation was observed across firms, between environmental recording and performance (19.81% and 10.05%) and social recording and performance (34.12% and 17.10%) scores. The hiatus between recording and performance in both environment and social categories appears to be stark.

Descriptive statistics and intercorrealtions for all other variables used in this study are presented in Table 3. We utilized the cases that had applicable values for all variables germane to the analysis

Table 2
Specification of The Pacific Sustainability Index (PSI) Score by Major Country Groups

Country	ASIA (20)		EEC (16)		EUROPE (7)		N. AMERICA(6		OCEANIA (4)		OTHERS (2)		USA (40)		ALL (95)			
Group (N)	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Max.	Min.
Environmenatal																		
Intent	69.42	(22.55)	75.72	(23.70)	59.34	(15.99)	76.93	(13.76)	74.04	(30.02)	61.54	(54.39)	46.60	(28.12)	60.63	(27.76)	100.00	0.00
Recording	22.47	(12.88)	28.21	(15.04)	25.38	(8.66)	25.89	(10.81)	29.51	(21.23)	23.84	(32.00)	12.06	(14.19)	19.81	(15.41)	59.31	0.00
Peformance	12.06	(11.01)	16.02	(10.21)	13.00	(7.65)	14.21	(10.97)	16.13	(16.79)	3.04	(2.14)	5.26	(8.54)	10.05	(10.57)	39.66	0.00
Overall	24.66	(12.78)	30.44	(13.59)	25.67	(7.62)	28.63	(10.71)	31.25	(19.59)	22.31	(26.60)	14.43	(13.37)	21.96	(14.54)	56.77	0.39
Social																		
Intent	53.18	(18.39)	58.88	(16.91)	57.76	(19.73)	54.83	(19.03)	64.65	(14.82)	46.16	(48.95)	37.21	(24.14)	48.19	(23.02)	94.12	0.00
Recording	34.71	(14.53)	45.72	(15.49)	30.82	(16.98)	40.95	(14.90)	49.19	(29.26)	31.41	(34.45)	27.38	(16.74)	34.12	(17.98)	78.00	1.45
Peformance	17.27	(11.89)	25.09	(14.69)	12.60	(10.45)	22.63	(10.85)	30.80	(25.58)	12.50	(17.68)	12.64	(12.49)	17.10	(14.02)	58.33	0.00
Overall	32.70	(13.65)	42.27	(13.87)	29.66	(14.93)	38.33	(13.91)	46.73	(25.68)	28.53	(32.07)	25.02	(15.96)	31.71	(16.78)	70.96	0.89
Overall PSI Score	**27.57**	**(11.90)**	**35.65**	**(11.90)**	**26.68**	**(9.86)**	**33.33**	**(11.56)**	**38.45**	**(21.78)**	**24.36**	**(28.19)**	**19.22**	**(13.95)**	**26.10**	**(14.66)**	**62.14**	**0.94**

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 quantitive social
5. Performance scores are calculated in both environmental and social reporting categroy when data are better than peer average, taking a leadership position for the sector, and at its maximum performance.

The Pacific Sustainability Index(PSI) was developed at the Roberts Enviornmental 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

after performing listwise deletions. The firm size, capital intensity, labor productivity, and R&D intensity were relatively significant at least at the 5% level of significance, particularly with respect to market-based performance including sustained growth rate (SGR). In particular, the intercorrelations between the PSI score and the firm performance, except OPROE and OPROI, reveal strong and consistent relationships. This suggests that enhancement in sustainability efforts (CSP) was helpful in explaining TBP, particularly the market-based performance and sustainable growth rate (SGR). In fact, the PSI Score was significantly (P<0.001) 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.

R&D intensity is positively correlated with the most indices of performance measures except with the return on shareholders' equity (OPROE). As expected, R&D intensity bears a positive correlation with the PSI scores (p<0.01) while it is also significant with all market-based performances and SGR (Table 3). These findings seem to be consistent with the traditional notion that the higher levels 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) even in a moderately technologically sophisticated industry sector such as oil production and petroleum refineries. Besides R&D intensity, other controlling variables such as the firm size, capital intensity, and labor productivity were also significantly and positively correlated with the PSI score and with most performance measures. However, PSI score was not correlated with manufacturing cost efficiency and debt leverage. The manufacturing cost efficiency factor is significantly negatively correlated with OPROA and OPROI. Further, the PSI score is significantly correlated to the market performance and is linked to two major accounting-based indicators, namely, OPROA and OPROI.

Thus, the impact of the PSI scores on performance seems to be varied depending on the performance measure under consideration. However, the PSI score, R&D intensity, capital intensity and labor productivity tend to be significantly and positively correlated with most market-based performance, particularly with respect to SGR. Contrary to our expectation, manufacturing cost efficiency is highly significant (at least at P<0.01) but negatively correlated with OPROA and OPROI. Although the variance inflation factor (V.I.F.) is not presented because of the table space limit, we performed collinearity diagnostics by examining the bivariate correlations and variance inflation factors. We found that the problem of multicollinearity does not appear to exist, i.e., variance inflation factors are between 1.15 and 3.26 after removing the overall individual score of environmental and social components from the model.

8.2 Results of Hierarchical Regression Analysis

Simple inter-correlation results do not always imply the importance of a variable when a set of variables is considered simultaneously, particularly, for the purpose of incremental effect of explanatory variables on various endogenous variables. Using hierarchical multiple regression analysis, the empirical models shown previously were estimated separately with respect to two major dimensions of the firm performance including SGR. As presented in Tables 4 and 5, the hierarchical regression analysis was used to empirically explore the nature of the relative significance of R&D and the PSI score on a firm's various indices of performance, after controlling for all moderating variables and one of two key strategy variables, i.e., R&D intensity and the PSI score in a separate and simultaneous step of the model. All regression models were highly significant (p < .001), indicating that the multiple regression models were useful for exploring the simultaneous effects of R&D and

Table 3
Means, Standard Deviations, and Correlationsa

Variables	Mean	St.Dev	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Dummy [b]	0.554	0.500													
2. Sustainability Index[c]	26.101	14.657	.17 +												
3. OPROA	0.143	0.090	.04	.37 ***											
4. OPROE	0.320	0.269	.01	.05	.61 ***										
5. OPROI	0.197	0.164	.01	.12	.76 ***	.83 ***									
6. Market value(Ln)	10.075	2.341	.15	.75 ***	.28 **	-.10	.06								
7. Tobin's Q	1.485	0.564	.10	.68 ***	.19 +	.00	.05	.59 ***							
8. Sustainable Growth	11.326	8.337	.12	.84 ***	.45 ***	.24 *	.25 *	.56 ***	.66 ***						
9. Firm Size (Ln Sale)	9.814	1.860	.33 ***	.73 ***	.31 **	.11	.18 +	.59 ***	.45 ***	.70 ***					
10. Manufacturing Cost	0.592	0.217	.14	-.02	-.29 **	-.26	-.28 **	.04	.12	.07	-.07				
11. Debt Leverage	0.302	0.162	.15	-.03	-.10	.15	-.18	-.20 *	-.05	-.02	.00	.20 +			
12. Capital Intensity	0.651	0.233	.13	.41 ***	.22 *	.03	.04	.28 **	.29 **	.41 ***	.38 ***	.23 *	.33 **		
13. Labor Productivity(Ln)	7.324	1.390	.32 **	.22 *	.21 *	.14	.12	.07	.24 *	.24 *	.26 *	.20 +	.04	.20 +	
14. R&D Intensity	0.187	0.262	-.15	.29 **	.24 *	.09	.27 *	.21 *	.21 *	.28 *	.19 +	.09	.10	-.16	-.18

[a] n = 95. + P < 010; * P<0.05; ** P<0.01; *** P<0.001

[b] Dummy Variables for Petroleum Refining (1) vs. Mining & Crude Oil (0)

[c] Sustainability Index indicates The Pacific Sustainability Index for the quality of the sustainability reporting

d Sustainable Growth indicates Sustainable Growth Rate

the PSI on firm performance, particularly with respect to market-based performance and SGR. This indicates the existence of a positive effect of R&D on the PSI score and establishes a link between the controlling strategy and performance. The results provide the credence to the argument that the improvement in a firm's environmental and social performance will lead to improving the firm's market-based performance with respect to its sustainable growth without taking on more financial leverage when other strategic factors are held constant.

Table 3(on pg.79) presents the 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 OPROA, OPROE, and OPROI. In addition, the coefficient of manufacturing cost efficiency is negative but highly significant (p< 0.001, in OPROA) and is uniformly linked to two other accounting performance measures at 5% level of significance. It supports the importance of manufacturing cost efficiency in the oil and petroleum industries, indicating that the firms with more efficient operations in manufacturing system outperform those without adequate efficiencies. Other strategic control variables like capital intensity and debt leverage were not found to be significant in any accounting performance measures. The coefficients of R&D intensity in step 2 were positive but significant at acceptable level in OPROI (P < 0.05). Additional inclusion of PSI accounted for additional 2 percent of the variance in OPROA (P < 0.01) only, which indicates higher operating returns on assets.

Table 4 presents the hierarchical regression results for models predicting market-based performance and (SGR). Once again, the strategic control variables accounted for nearly 30 to 37 percent of the variance in market-based performance, i.e., market value, Tobin's Q, and SGR. More importantly, labor productivity is more likely to be a key to sustainable growth than other market performance measures. Further, the firm size is uniformly and highly significant (P < 0.001) for most market-based performance. Contrary to our initial expectation, manufacturing cost efficiency and capital intensity have little to contribute to market-based performance. Debt leverage is also significantly (P < 0.01) but negatively linked to the market value. This result lends support to the notion that the firms can sustain and maintain a target capital structure without having to increase financial leverage.

As presented in Table 4, the results of the addition of R&D intensity accounted for an additional 2 to 3 percent of the variance in most market performance measures. As expected, R&D intensity is a significant predictor (p<0.05) of a firm's market-based performance but not for accounting-based performance, except for OPROI. The findings of the present study suggest that R&D is a key to sustainable growth for the firm in both crude oil production and petroleum refining industries. Further, R&D intensity can be recognized as one of the most robust determinants of a firm's market performance and SGR.

There was a strong evidence of a direct relationship between the environmental and social sustainability index (the PSI) and market performance (step 3, Table 5). The addition of the PSI scores accounted for an additional 2 to 3 percent of the variance in all indices of market-based performance measures. Furthermore, the coefficient for the PSI score was highly significant for all performance measures (P < 0.001) and positive. Although there is not a great deal of empirical evidence to suggest the direct link between the PSI and market performance (Hillman & Keim 2001; Judge & Douglas 1998), the strategic drive for environmental and

Table 4
Results of Hierarchical Regression Analysis for Accounting-based Performancea

Independent	OPROA			OPROE			OPROI		
Variables	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
(Constant)	.129 (.05) *	.159 (.07) *	.173 (.07) *	.235 (.26) *	.250 (.26) *	.234 (.27) *	.247 (.07) *	.259 (.08) *	.258 (.06) *
Dummy	-1.036 (1.01)	-2.353 (1.77)	-1.870 (1.20)	-.021 (.07)	-.002 (.07)	.000 (.07)	.004 (.04)	.019 (.04)	.019 (.04)
Firm Size (Ln Sale)	.021 (.01) **	.017 (.01) *	.019 (.01) **	.045 (.02) **	.041 (.02) *	.051 (.02) *	.026 (.01) *	.025 (.01) *	.026 (.01) *
Manufacturing Cost	-.205 (.06) ***	-.207 (.05) ***	-.203 (.05) ***	-.377 (.15) *	-.379 (.15) *	-.374 (.15) *	-.198 (.10) +	-.231 (.09) *	-.173 (.09) +
Debt Leverage	.061 (.08)	.016 (.08)	.013 (.08)	.303 (.23)	.282 (.24)	.283 (.24)	-.063 (.14)	-.169 (.15)	-.169 (.15)
Capital Intensity	-.058 (8.59)	.006 (.05)	.003 (.05)	-.027 (.15)	.083 (.16)	.087 (.16)	.023 (.09)	.111 (.10)	.111 (.10)
Labor Productivity	.015 (.01) *	.026 (.01) *	.015 (.01) *	.050 (.02) *	.040 (.02) *	.043 (.03)	.025 (.01) +	.020 (.01)	.020 (.02)
R&D Intensity		.064 (.04) *	.038 (.04)		.210 (.12) *	.205 (.11) *		.167 (.07) *	.167 (.07) *
Sustainability Index			.003 (.01) *			.002 (.00)			.000 (.00)
Model R^2	.2253	.2312	.2536	.1987	.2035	.2103	.1976	.2068	.2064
Adjusted R^2	.1735	.1853	.2043	.1238	.1564	.1587	.1189	.1279	.1185
Δ in R^2		.0059	0.0224**		.0048	.0068		.0092	.0000
F-Ratio	4.1995***	5.6762***	6.6897***	3.5332*	3.7198*	3.4158*	2.3853	2.5943*	2.2863*
F-ratio for Δ in R^2		1.2563	7.9856**		2.4223	.0569		2.4223*	.0001

[a] n=98. Unstandardized regression coefficients, with standard errors in parentheses, are shown.

[b] Dummy variable indicates Petroleum Refining (1) vs. Mining & Crude Oil (0)

[c] Sustainability Index indicates The Pacific Sustainability Index (PSI)

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

Table 5
Results of Hierarchical Regression Analysis for Market-Based Performance Including Sustainable Growth Rate[1]

Independent	Maket value			Tobin's Q			SGR[d]		
Variables	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
(Constant)	6.501 (1.75) ***	6.397 (1.72) ***	8.198 (1.49) ***	.876 (.50) *	.892 (.50) *	1.363 (.45) **	10.260 (5.49) **	10.685 (5.52) **	11.361 (4.40) *
Dummy[b]	.688 (.46)	.550 (.45)	.324 (.38)	.129 (.13)	.150 (.13)	.091 (.12)	.422 (1.43)	.590 (1.45)	-.260 (1.13)
Firm Size (Ln Sale)	.455 (.13) ***	.557 (.14) ***	.587 (.14) ***	.141 (.04) ***	.125 (.04) **	1.192 (.56) *	3.853 (.41) ***	3.729 (.45) ***	1.523 (.49) **
Manufacturing Cost	.792 (1.07)	.878 (1.05)	1.049 (.89)	.133 (.31)	.120 (.31)	.164 (.27)	3.919 (3.37)	3.813 (3.38)	4.456 (2.62) *
Debt Leverage	-3.436 (1.58) **	-1.682 (.80) *	-3.328 (1.37) *	-.491 (.45)	-.637 (.47)	-.669 (.42)	-1.021 (4.96)	-.151 (5.25)	-.611 (4.06)
Capital Intensity	.970 (1.03)	.169 (1.09)	-.356 (.93)	.522 (.29) +	.644 (.32) *	.507 (.28) *	5.959 (3.22) *	6.933 (3.51) *	4.958 (2.73) *
Labor Productivity	-.121 (.16)	-.169 (.16)	.086 (.14)	.132 (.05) **	.139 (.05) **	.129 (.04) *	2.092 (.51) ***	2.034 (.52) ***	1.075 (.43) *
R&D Intensity		1.682 (.80) *	1.399 (.62) *		.486 (.23) *	.466 (.21) *		4.521 (2.11) *	4.109 (2.04) *
Sustainability Index[c]			.091 (.02) ***			.024 (.01) ***			.343 (.05) ***
Model R^2	.2986	.3120	.3328	.3012	.3286	.3518	.3713	.3743	.4013
Adjusted R^2	.2358	.2688	.2985	.2490	.2758	.2843	.3248	.3312	.3758
Δ in R^2		.0134*	.0208*		.0274**	.0232**		.0031	.0270**
F-Ratio	6.0392***	6.4173***	8.5102***	6.3652***	7.0132***	8.9364***	10.8862***	8.6143***	12.4920***
F-ratio for Δ in R^2		3.4263*	5.7853***		4.3785**	8.3876**		.0412	14.3610***

[a] n=95. Unstandardized regression coefficients, with standard errors in parentheses, are shown.

[b] Dummy variable indicates Petroleum Refining (1) vs. Mining & Crude Oil (0)

[c] Sustainability Index indicates The Pacific Sustainability Index

[d] SGR indicates Sustainable Growth Rate

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

corporate social performance can be important factors in improving the firm's market value and growth in petroleum refining and crude oil industries.

As hypothesized, we found R&D intensity and the sustainability index (the PSI score), as a surrogate of CSP, to be significantly and positively associated with most market-based performance indicators while they correlated positively with OPROA and OPROI of accounting based measures. Firm size and labor productivity were significantly and positively associated with most performance measures. However, debt leverage, was not found to be a significant predictor of most performance measures except for market value and capital intensity. In addition, the proposed links between explanatory variables and performance measures are not significantly different between two industry groups (i.e., crude oil production vs. petroleum refining). Accordingly, the marginal effects of R&D intensity and the sustainable index (the PSI score) in determining the firm profit and market growth, even after controlling all other strategic variables, were not found to be significantly different.

9. CONCLUSIONS AND IMPLICATIONS

The purpose of this study was to empirically examine the effect of corporate sustainability efforts on the business performance of the firm. Using a reliable data set, namely PSI, published by the Roberts Environmental Center, we studied the effect of social performance of a firm with respect to accounting-based and market-based performance as well as sustainable growth rate (SGR) in crude oil production and petroleum refining industries. Particularly, this study explored the directions and magnitudes of the operational relationships between key strategic factors. Utilizing hierarchical regression analysis, the study explored the nature of a firm's economic performance with respect to various dimensions of performance measures such as accounting (OPROA, OPROE, OPROI) and market-based (Tobin's Q, market value, sustained growth rate). Although the focus of this study was on the significant relationships between the CSP measured in terms of PSI and TBP, it also explored how other business strategic factors, such as firm size, manufacturing cost efficiency, capital intensity, debt leverage, and labor productivity are linked to the firm's economic performance.

More specifically, this study attempted: (1) to explore the existence of a diverse set of linkages between a select group of business variables and various indices of performance measures and (2) to determine the relative importance of business strategies (the PSI standards and R&D intensity), individually and jointly, for improving business performance in crude oil production and petroleum refining industries. The results of the study indicates that the PSI and R&D intensity can be viewed as major competitive determinants for improving performance, particularly, with respect to market-based performance in these industries across countries.

As is true with any empirical studies, there are limitations of the present study. Some of the limitations might be due to the bias in sample selection due to our choice of the specific industries, and due to operationalization of the variables. Moreover, the present study looked at relatively short-term data due to unavailability of PSI scores for a longer period of time. A more extensive longitudinal database, if available, could uncover other important findings with regard to the effects of the PSI scores on the firm performance. Notwithstanding these limitations, this study offers insights into the social and sustainability factors that ensure a firm's profit and growth.

The major findings of the present study will be of great

importance to decision makers because it not only identifies the key strategic elements that lead to success in diverse economic contexts, but also is useful to managers in determining the appropriateness of the competitive strategies that ensures model corporate citizenship. This study also provides with new operational insights into the PSI and performance linkage in business and economic research, particularly across different industries and countries. The strategic issues of environmental and socio-economic stewardship have already and will continue to be the focus of economic activities and innovations worldwide. Further, the major findings of this study will provide useful insights into the strategic effect of the PSI on the firm's tangible business performance and sustainable growth for those industries and firms that are of great interest in today's competitive environment. Contrary to the previous studies which correlated a simple combination of dependent variables and independent variables related to social issues, this study used the simultaneous linear combinations of PSI factor with other major strategic variables and multiple indices of the firm performance. The findings of this study can be re-tested and extrapolated to different industries. We anticipate that this study has opened the door to additional research efforts that will help investigators to test the generalizability of the relationship between the maintenance of sustainability standards and business performance across industries and countries. Follow up studies should reexamine and enrich the sustainability factors to examine how "doing good" positively impacts the bottomline.

REFERENCES

1. **Ambec, S. & Lanoie, P., 2008.** Does it pay to be green? A systematic overview. The Academy of Management Perspectives (formerly The Academy of Management Executive)(AMP), 22(4), 45–62.
2. **Aragón-Correa, J.A. & Rubio-López, E.A., 2007.** Proactive Corporate Environmental Strategies: Myths and Misunderstandings. Long Range Planning, 40(3), 357-381.
3. **Bansal, P., 2005.** Evolving sustainably: a longitudinal study of corporate sustainable development. Strategic Management Journal, 26(3), 197-218.
4. **Bettis, R.A. & Mahajan, V., 1985.** Risk/Return Performance of Diversified Firms. Management Science, 31(7), 785-799.
5. **Cordeiro, J.J. & Sarkis, J., 1997.** Environmental proactivism and firm performance: evidence from security analyst earnings forecasts. Business Strategy and the Environment, 6(2), 104-114.
6. **Dawson, G.F. & Probert, E.J., 2007.** A sustainable product needing a sustainable procurement commitment: the case of green waste in Wales. Sustainable Development, 15(2), 69-82.
7. **Edwards, D., 1998.** The Link Between Company Environmental and Financial Performance, Earthscan.
8. **Elgin, B.B., 2007.** Little Green Lies. Business Week, 45-52.
9. **Friedman, M., 1970.** A Friedman doctrine: The social responsibility of business is to increase its profits. The New York Times Magazine, 13(1970), 32–33.
10. **Hart, S.L., 1995.** A Natural-Resource-Based View of the Firm. The Academy of Management Review, 20(4), 986-1014.
11. **Hart, S.L. & Ahuja, G., 1996.** Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance. Business strategy and the Environment, 5(1), 30–37.
12. **Hillman, A.J. & Keim, G.D., 2001**. Shareholder Value, Stakeholder Management, and Social Issues: What's the Bottom Line? Strategic Management Journal, 22(2), 125-139.
13. **Holtzman, Y., 2008.** Innovation in research and development: tool of strategic growth. Journal of Management Development, 27(10), 1037–1052.
14. **Ito, K. & Pucik, V., 1993.** R&D spending, domestic competition, and export performance of Japanese manufacturing firms. Strategic Management Journal, 14(1), 61-75.
15. **Jacobs, B.W., Singhal, V.R. & Subramanian, R., 2010.** An empirical investigation of environmental performance and the market value of the firm. Journal of Operations Management, (forthcoming)
16. **Judge, W.Q. & Douglas, T.J., 1998.** Performance Implications of Incorporating Natural Environmental Issues into the Strategic Planning Process: An Empirical Assessment. Journal of Management Studies, 35(2), 241-262.
17. **Karpoff, J.M., Lott, J. & Wehrly, E.W., 2005.** The Reputational Penalties for Environmental Violations: Empirical Evidence. The Journal of Law and Economics, 48(2), 653-675.
18. **Klassen, R.D. & McLaughlin, C.P., 1996.** The Impact of Environmental Management on Firm Performance. Management Science, 42(8), 1199-1214.
19. **Konar, S. & Cohen, M.A., 2001.** Does the market value environmental performance? Review of Economics and Statistics, 83(2), 281–289.
20. **Lang, L.P. & Stulz, R.M., 1994.** A Tobin's q Corporate Diversification and Firm Performance. Journal of Political Economy, 102(6), 1248 - 1279.
21. **Lee, J. & Habte-Giorgis, B., 2004.** Empirical approach to the sequential relationships between firm strategy, export activity, and performance in U.S. manufacturing firms. International Business Review, 13(1), 101-129.
22. **Markides, C.C., 1995**. Diversification, restructuring and economic performance. Strategic Management Journal, 16(2), 101-118.
23. **McGuire, J.B., Sundgren, A. & Schneeweis, T., 1988.** Corporate social responsibility and firm financial performance. Academy of management journal, 31(4), 854–872.
24. **McWilliams, A. & Siegel, D., 2000.** Corporate Social Responsibility and Financial Performance: Correlation or Misspecification? Strategic Management Journal, 21(5), 603-609.
25. **Miller, D.J., 2004.** Firms' technological resources and the performance effects of diversification: a longitudinal study. Strategic Management Journal, 25(11), 1097-1119.
26. **Min, H. & Galle, W.P., 2001.** Green purchasing practices of US firms. International Journal of Operations & Production Management, 21(9/10), 1222.
27. **Orlitzky, M., Schmidt, F.L. & Rynes, S.L., 2003.** Corporate Social and Financial Performance: A Meta-Analysis. Organization Studies,, 403 -441 vol. 24:
28. **Roman, R.M., Hayibor, S. & Agle, B.R., 1999.** The Relationship between Social and Financial Performance. Business & Society,, 109 -125 vol. 38:
29. **Rothenberg, S., Pil, F.K. & Maxwell, J., 2001.** Lean, green, and the quest for superior environmental performance. Production and Operations Management, 10(3), 228-243.
30. **Rowley, I., 2009.** Toyota, Honda Heat Up the Hybrid War. Business Week, 18.
31. **Russo, M.V. & Fouts, P.A., 1997.** A Resource-Based Perspective on Corporate Environmental Performance and Profitability. The Academy of Management Journal, 40(3), 534-559.
32. **Smith, C.W. & Watts, R.L., 1992.** The investment opportunity set and corporate financing, dividend, and compensation policies. Journal of Financial Economics, 32(3), 263-292.
33. **Sterrett, D., 2010**. Chicago gas station owners hit by BP spillover | Crain's Chicago Business. Chicago Business Tribune. Available at: http://www.chicagobusiness.com/cgi-bin/article.pl?articleId=33548 [Accessed July 5, 2010].
34. **Tarrantino, D., 2004.** Determining Sustainable Growth." Physician Executive. Physician Executive, 30(6), 70 - 71.
35. **The Economist, 2010.** Briefing BP and the oil spill: The oil well and the damage done. The Economist, 395(8687), 65-67.
36. **Waddock, S.A. & Graves, S.B., 1997.** The Corporate Social Performance-Financial Performance Link. Strategic Management Journal, 18(4), 303-319.
37. **Wagner, M., 2005.** How to reconcile environmental and economic performance to improve corporate sustainability: corporate environmental strategies in the European paper industry. Journal of Environmental Management, 76(2), 105-118.
38. **Wagner, M., Van Phu N., Azomahou, T. & Wehrmeyer, W., 2002.** The relationship between the environmental and economic performance of firms: an empirical analysis of the European paper industry. Corporate Social Responsibility and Environmental Management, 9 (3), 133-146.
39. **Walley, N.W. & Whitehead, B., 1994.** It's not easy being green. Harvard Business Review, 72, 3.
40. **Worrell, D.L., Wallace N. Davidson III & Sharma, V.M., 1991.** Layoff Announcements and Stockholder Wealth. The Academy of Management Journal, 34(3), 662-678.