

IS IT BENEFICIAL TO INCUR ENVIRONMENTAL COST? A CASE STUDY OF TOYOTA MOTORS CORPORATION, JAPAN

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ABSTRACT

There is a growing demand for corporate social responsibility in accounting and non-financial reports in the form of sustainability reports. Environmental accounting is now advocated in Japan following the initiatives of the government. Apart from being required, nor voluntary, a cost-benefit study may encourage more disclosures and reporting guided by a prescribed framework if benefits justify the costs. With Toyota Motors Corporation as subject, this study aims to: (1) describe Toyota's environmental accounting report within the context of Japan's prescribed guidelines; (2) relate the environmental costs to economic effects; and (3) relate environmental costs to the firm's financial performance.

BACKGROUND OF THE STUDY

Environmental accounting concept and practice has evolved from sustainability reports and the broader concept of corporate social responsibility. In this age when globalization and the growth of multinational enterprises have been blamed for environmental neglect and depletion of natural resources, it is but relevant to highlight the activities companies engage in to preserve and repair its natural environment. Senge (2008) calls for a 'necessary revolution' in the way businesses are conducted - a new business rationale of sustainability. Porter (2008), updates his views on competitive advantage with green solutions on resource productivity to societal problems.

Sustainability reporting, particularly, environmental accounting has been advocated by Japanese companies and the government since 1999. This is in response to the absence of generally accepted standards on environmental reporting and a move to further advance the Global Reporting Initiative of 1997.

Globally, companies in the computers & electronics and automotive manufacturing have been the leaders in sustainability reporting next to pharmaceutical companies. The highest growth in reporting has taken place in Japan, France and the U.K. followed by Germany. Standardization has been observed to increase quantity and quality of reporting particularly in Japan due to the government's regulation and encouragement (Kolk 2003).

In the Philippines, there is no set standard that provides for the consistency and comparability of environmental disclosures within firms because it is left to the discretion of management (Aquino 2009). It is therefore, important to study the environmental accounting and reporting practices of Japan because it may influence the same practices in its subsidiaries in developing countries like the Philippines.

STATEMENT OF THE PROBLEM

Is it beneficial to incur environmental cost?

Based on the experience of Japanese companies, particularly Toyota Motors Corporation, aside from rooting on culture, and compliance with regulations, are environmental investments and expenses beneficial? Taking the lead role in advocating environmental accounting should also merit its benefits to convince other countries and companies to do the same.

RESEARCH OBJECTIVES

This study has the following objectives to prove the cost-beneficial view of environmental accounting:

- To describe Toyota's environmental accounting report within the context of Japan's prescribed guidelines;
- To relate the environmental costs and investments to the firm's financial performance;

CONCEPTUAL FRAMEWORK

From an Economic Perspective

This paper uses the Kaldor-Hick Efficiency basis of cost-benefit analysis. The Kaldor-Hicks efficiency states that an outcome is more efficient if those that are made better off could in theory compensate those that are made worse off, so that a Pareto improving outcome results. This criterion is widely applied in welfare economics and managerial economics and forms the underlying rationale for cost benefit analysis because it provides a more practical standard justifying costs with net social benefits. The theoretical foundations of the cost-benefit theory could be traced back in welfare economics in the 19th century France (Nas 1996).

The OECD has espoused cost-benefit analysis in their public advocacies on environment policy, transportation planning, and health care. Particularly for the environment, the OECD has highlighted special challenges on environmental problems and environmental policy that pose

for cost-benefit analysis. It is in this light that the OECD suggests cost benefit appraisals to take account of recent concern about sustainable development (OECD 2006).

In cost-benefit analysis, an alternative, such as engaging in environmental activities is evaluated by comparing the total costs, in this case environmental expenses and investments, with the total benefits, cost savings, other income from recyclable materials and avoidable clean up and litigation costs. The typical decision criterion would be to accept the alternative where benefits exceed the costs, this in effect, is the application of the Kaldor-Hicks Efficiency theory.

The environmental cost presented as the major element in environmental accounting enables correlation of each item with the environmental conservation effects and economical effects associated with environmental measures. These environmental costs are equated with the effects that were achieved by activities for promoting environmental conservation efficiently and effectively while maintaining the friendly relationship with society in order to have sustainable development (Japan Environment Agency 2000).

In a larger context, environmental costs deemed as independent variables are influenced by intervening variables such as Japanese environmental laws and guidelines and the culture of environmental conservation. The benefits are the dependent variables which are measureable results in the form of cost savings, other income from sale of recyclable materials, and physical benefits. Other eco-marketing and brand preferences, however, are difficult to include in the measurement.

From a Sociological Perspective

Among advocates of the network theory was Podolny & Page (1998). They defined a network form of organization as “any collection of actors that pursue repeated, enduring exchange relations with one another and, at the same time, lack a legitimate organizational authority to arbitrate and resolve disputes that may arise during the exchange”. Environmental accounting although deemed voluntary in Japan, is somehow a common practice guided by the government’s initiatives. TMC as a multinational company has subsidiaries in various developing countries where environmental standards may not be established yet, like the Philippines. Hence, any disparity in environmental reporting is not covered by any legal regime, thus preserving the voluntary initiatives and relying heavily on organizational culture of TMC to advance the practice in its subsidiaries.

In earlier sociology, Wellman established the patterns of social relationships amongst members. He explored the deep structures and network patterns of complex social systems that constrain the actions of ‘actors’. Thus, the focus is “not on voluntaristic actors, but on structural constraints” (Wellman 1983 in Ritzer 1988). Since TMC is reporting a consolidated financial report and sustainability report, it’s multinational structure facilitates the practice of sustainability, particularly environmental reporting.

Actors, like TMC Japan or TMC Philippines (individual or collective) may have differential access to valued resources (wealth, power, information). The result is that structured systems tend to be stratified, with some components dependent on others (Ritzman 1988).

According to Molm (2001), when an actor has possessions or behavioral capabilities that are valued by other actors, they are resources in that actor's relations with those others. Social exchange resources include not only tangible goods and services, but capacities to provide socially valued outcomes such as approval or status (Molm 2001).

In the case of TMC's relationship with its subsidiaries, worldwide, the relationship is clearly a network direct exchange. Exchange networks are sets of direct exchange relations among actors, either individual or collective, that are connected to one another. Connected relations are linked by a focal actor (such as TMC Japan), and exchange in one relations affects the frequency or value of exchange in the other. Connections are positive to the extent that exchange in one relation increases exchange in the other (Molm 2001). Environmental management systems are well integrated in Japanese headquarters operations and hence, expected to be observed by subsidiaries worldwide regardless of differences in values system.

Parsons' Normative Institutional Theory

Japanese environmental accounting practices can be explained by Parsons' institutional approach to organizations. He argues that "value systems of organizations are legitimized by its connections to the main institutional patterns in different functional contexts" (Scott 2001). As such, the value of environmental management can be seen as in compliance with Japanese norms of caring for the environment. He applies his general cultural-institutional arguments to organizations primarily by examining the relation between an organization and its environment (business and natural environment).

Since environmental management systems are institutionalized in Japanese society and production systems, these normative structures legitimize the patterns of operations of MNCs like Toyota Motors Corporation. However, different values systems may exist between TMC Japan and their subsidiaries where they have extended enterprise systems.

Organizations operating in different functional sectors are legitimated by different values, exhibit different adaptive patterns, and are governed by different codes and normative patterns. Moreover, value systems are stratified within a society such that organizations serving more highly esteemed values are thought to be more legitimate and are expected to receive a disproportionate share of societal resources (Parsons 1953 in Scott 2001).

Parsons adds that an organization is a subsystem of a wider social system which is the source of the meaning, legitimization, or higher-level support which makes the implementation of the organization's goals possible (Parsons 1956 in Scott 2001).

Likewise, the cultural-cognitive pillar of institutional theory could also be related to TMC and its subsidiaries. For cultural-cognitive theorists, compliance occurs in many circumstances because other type of behavior are inconceivable; routines are followed because they are taken for granted as “the way we do these things”, (Scott 2001).

As for TMC’s early compliance with environmental accounting guidelines, Scott (2001) explains this through attributes in structure and performance. He states that size is important and that the larger organizations are more prone to early adoption of attributes. Larger organizations tend to be more resource rich; larger organizations are more differentiated and hence more sensitive to environmental changes (Scott 2001).

RESEARCH HYPOTHESES

One major criticism on corporate social responsibility is that it distributes the final outputs of business operations following Fiduciary Capitalism. To test whether the final outputs or profitability is impaired as a result of spending for environmental costs, the following alternative hypotheses are formulated:

H_{a1}: The economic effect has significant positive correlation with environmental costs

H_{a2}: Profitability has significant correlation with environmental costs

Profitability could be measured in terms of absolute net income and other pertinent ratios like return on sales, return on assets, dividends per share, and earnings per share. The relationship of environmental costs with business activity measured in terms of revenues shall be established. Is it a fixed portion of revenues or is there a direct relationship? If a company has more production activity, does it follow that it has more environmental costs?

SIGNIFICANCE OF THE STUDY

While most Japanese companies abide by the guidelines set by the Department of Environment, cost benefit studies are wanting to measure the significance of environmental costs on the economic and environmental effects. This justification can serve as a basis to encourage other companies or countries where environmental accounting has no set standard or guidelines yet.

SCOPE AND LIMITATIONS

This case study covers the sustainability and annual reports of Toyota Motors Corporation for the fiscal years ending 1998 to 2009. For comparability and consistency purposes due to available data, the starting period of this analysis is from fiscal years ending

1998 to 2008. The reason for such is that TMC's 2009 sustainability report presents environmental accounting for the fiscal year ending 2008. The report on environmental accounting for the fiscal year ending 2009 will only be published in 2010 sustainability report. Considering that this paper shall be executed in a two month period, a case study is more viable than a full blown cross-company industry or cross-country study which is the ultimate objective of the researcher.

For data processing, this study is designed to be a qualitative research. While there will be attempts to establish correlation, other significant influences and factors shall be discussed to have a multifaceted view of environmental accounting in a Japanese context.

ASSUMPTIONS

While Toyota Motors Corporation cannot generalize the findings for the Japanese automotive industry environmental accounting practices, this study may assume that the findings are significant indicators of performance which could be applicable to any manufacturing company in a similar environment – like electronics and related industries.

Corporate Social Responsibility (CSR) is the bigger theory behind sustainability reporting. From CSR, corporate citizenship (CC) is a more specific term referring to corporate social performance, which is a detailed construct of CSR. Corporate citizenship then refers to social and environmental performance of companies. In relation to this study, sustainability reporting is assumed to emanate from corporate citizenship.

REVIEW OF RELATED LITERATURE

Since the 1950s corporate social responsibility (CSR) has been a research construct that is subjected to various definitions and perspectives. In order to relate environmental accounting and the objectives of this paper, a brief discussion of relevant CSR theories and corresponding prominent research themes leading to sustainability reporting shall be narrated. The concept of sustainability, however, has three dimensions: economic, social and environmental performance. Hence, environmental accounting is the ultimate direction of this section with emphasis on international perspectives and the Japanese initiative. Toyota Motor Corporation's (TMC) sustainability reporting is described towards the end.

CSR as a Construct of Theories

Howard Bowen's (1953) definition of social responsibility as "obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society", has brought about two

relevant CSR theories to this study: corporate social performance (CSP) and the stakeholder theory. Both have attained widespread acceptance in social and business management research.

Over several decades now, the role of businesses as corporate citizens has evolved due to changing societal expectations. Multiple stakeholders are now demanding increasing governance of companies on multi-faceted aspects of corporate performance. Wood (1991) views CSP as altering corporate behavior to produce less harm and more beneficial outcomes for society and their people (Wood 1991). In the stakeholder theory, on the other hand, a company ought to be managed for the benefit of its stakeholders: its customers, suppliers, owners, employees, and local communities, and to maintain the survival of the firm (Evan and Freeman 1988).

In order to combine the two CSR theories, and as seen most relevant to the objectives of this paper, George Steiner's (1971) CSR definition shall be referred to because the subject company, Toyota Motors Corporation Japan, has grown so large yet responsible over its profitable operations in various countries. Businesses, according to Steiner (1971), are and must remain fundamentally an economic institution with responsibilities to help society achieve its basic goals and therefore, have social responsibilities. Steiner emphasizes that the larger a company becomes, the greater are its responsibilities. Companies, however, can assume some share of social responsibility at no cost and often with a short-run as well as long-run profit (Steiner 1971).

Another relevant view on CSR is Archie Carroll's definition that social responsibility encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time (Carroll 1979). Specifically, discretionary expectations highlight different values system of stakeholders such as concern for employees, communities or the natural environment. In this age of global warming, the environment is undoubtedly a very important consideration for Japanese companies and most developed countries. Toyota Motors Corporation Japan and the rest of the global automotive manufacturers took part in the development of the global reporting initiative. In coordination with the Japanese government, TMC participated in drafting its Japan's guidelines for environmental reporting.

CSR and Firm Performance

Various researches have sought to examine the relationship between corporate social performance and financial performance. However, poor measures and weak theory construction are often mentioned as causes of the variability in findings (Orlitzky 2008). In order to effectively operationalize CSR, corporate financial performance (CFP) and corporate citizenship (CC) were considered less ambiguous and hence related to profitability. Orlitzky, Schmidt and Rynes (2003) supports that there is a positive relationship between corporate citizenship and corporate financial performance with causal mechanisms such as the improvement of managerial knowledge and skills and enhance corporate reputation (Logsdon and Wood 2002). Along the

same line, Jones and Murrell (2001) examined how a firm's public recognition for exemplary social performance can serve as a positive signal of the firm's business performance to shareholders. In addition, Orlitzsky (2008) cites the following causal mechanisms that link CFP and CC: efficiency, increasing competitors' costs, attracting more productive workforce, boosting sales revenues, and reducing business risk.

More importantly, there are strong theoretical arguments for the reverse causation of CFP and CC. The arguments about reverse causation may generally be subdivided into two broad categories: the slack resources view and the normative view.

Consistent with Steiner's earlier view on CSR, high levels of CFP may provide the slack resources necessary for a company to engage in corporate social responsibility and responsiveness; and the availability of excess funds for voluntary social and environmental policies are up to management discretion (Carroll 1979, McGuire et al 1988, Cyert and March 1963; Ullmann 1985). In the foregoing, the intervening variables on this reverse causation are innovation and firm size (Orlitzky 2008).

Evidence from the United States supports that slack resources view and show that the largest number of publicly listed firms that did not have environmental policy was the low financial performers; while high financial performers did have higher incidences of environmental policies as compared with the low financial performers (Stanwick and Stanwick 2000).

Globalization Moves CSR Forward

Globalization is the process of intensification of cross-area and cross-border social relations between actors from very distant locations, and of growing transnational interdependence of economic and social activities (Scherrer & Palazzo 2008).

In globalization discussions, the presence of multinational companies (MNCs) and their emergent powers come into fore. MNCs have become very powerful economic and social agents. The world's biggest corporations have revenues that equal or even exceed the gross domestic product of some developed states (Chandler and Mazlish 2005). The power of MNC's is not just based on the enormous amount of resources they control. It is enhanced by their mobility and their capacity to shift resources to locations where they can be used most profitably and to choose among suppliers, applying criteria of efficiency. In effect, this gives MNCs the latitude to choose locations and the legal systems under which they will operate (Roach 2005; Scherer et al, 2006). With globalization, businesses become political actors that have social responsibilities beyond their economic role, and mere compliance with the law (Scherrer & Palazzo 2008).

In relation to developing countries where MNCs have production and other operations, the former has little or no bargaining power lest the latter choose other competing countries where the investment climate is more attractive. One predominant CSR concern is that

governments may ignore corporate irresponsibility or refuse to enforce protective labor or environmental standards in the law as an inducement to foreign investment (Aman 2001; Williams & Aguillera 2008).

Therefore, from an actor centered perspective, a MNC may take the initiative in moving forward CSR while riding the waves of globalization for the benefit of developing countries. Another comparative approach is the study of CSR within MNCs to determine whether there are differences in practices not only between the home MNC and the subsidiaries but also across the different subsidiaries worldwide (Allen 2006; Williams & Aguillera 2008).

Sustainability Emerges from Global Initiatives

Non-financial reporting by companies is a relatively new concept in publishing annual performance. The most significant is perhaps the Global Reporting Initiative. Launched in 1997 by the Coalition for Environmentally Responsible Economies, a U.S. non-governmental organization, and the United Nations Environment Program, its objective is to enhance the quality, rigor, and utility of sustainability reporting.

On the same year (1997), the United Nations Framework Convention on Climate Change, on its third session adopted the Kyoto Protocol. The agreement provides that 38 countries including developed and economies in transition reduce their Green House gasses including carbon dioxide emissions to a total of 5.2% below the 1990 level during the period 2008 to 2012 (Takao & Tatsuyoshi 2002).

GRI was supported by representatives from business, non-profit advocacy groups, accounting bodies, investor organizations, trade unions, and other concerned groups. These stakeholders have built a consensus around a set of reporting guidelines with the aim of achieving worldwide acceptance (Sustainability Reporting Guidelines 2002). However, adoption of the guidelines for economic, environmental and social dimensions of business activities, product and services were deemed voluntary.

The early success and swift progress of the GRI was attributed to the following drivers: expanding globalization; the search for new forms of global governance; emergence of sustainability frameworks; and the development of modern accounting and reporting practices (Enderle 2004).

Sustainability reporting emanated from the Global Reporting Initiative five years after. Although initially defined in terms of the natural environment, it evolved into a more encompassing concept that embraced the larger social and stakeholder environment, otherwise known as the triple bottom line - economy, society and environment. Sustainability reporting serves as a guideline for organizations to disclose their sustainability performance regardless of size or type, sector or geographic region. On the other hand, Senge (2008) argues that the most important and encompasses all priorities is the environment. He posits that there could be no healthy economy without a stable and vibrant social order.

Representatives from Toyota, Ford, General Motors, BMW, Honda, and Volkswagen, together with country industry associations, participated in the working groups. As far as environmental reporting is concerned, the performance indicators are on emissions, effluents and waste (GRI 2004). This standardization of sustainability reporting by the GRI and with the support of government regulation and incentive is seen to increase both the quantity and quality of reporting (Kolk 2003).

In the period 1998 to 2001, the frequencies of sustainability reporting were seen highest in the chemicals & pharmaceuticals, computers & electronics, automobile, utilities and oil & gas companies in the Fortune Global 250 companies; and with the U.K. and Japan leading countries with significant growth percentages of reporting (Kolk 2003).

Sustainability Reporting and Traditional Performance Evaluation

There are three pioneering studies on combining sustainability reporting with traditional financial analysis. Chousa and Castro (2006) translate the impacts of social and environmental activities into accounting and financial terms. This allows the management of impacts over business risks, profitability and value creation. In their proposed integrated model for financial analysis and sustainability, they attempted to equate social and environmental factors (renewable materials, wastes, pollution, energy consumption, etc.) with measures of business performance (usually sales) (Chousa & Castro 2006).

Similarly, a Greek study by Karatzoglou (2006) followed Chousa and Castro's attempt by combining traditional accounting return ratios and business sustainability. Using return on investment (ROI), return on equity (ROE), residual income and return on capital employed (ROCE), Karatzoglou proposed a few modifications on the accounting treatment to allow for consideration of sustainability operating expenses.

Thirdly, Mook (2006) proposes the expanded value added statement by integrating and reporting economic, social, and environmental performance.

The measures established by Chousa and Castro (2006), Karatzoglou (2006) and Mook (2006), however, are only viable if there is complete information and can presumably be prepared from an internal company perspective. Relying heavily on published sustainability and annual financial reports may not facilitate the adoption of the proposed integrated models. Most of the published information in sustainability reports, like environmental costs and investments, have been processed and cannot be traced anymore to income statement accounts. This makes the earlier attempts to integrate sustainability reporting with financial reporting difficult unless initiated by companies themselves. The current practice is that sustainability reports are published separately in form and substance from annual financial reports.

The main environmental concerns on financial accounting analysis are the recognition, measurement and disclosure of environmentally related economic impacts on business. Specifically, these may involve environmentally induced expenses like fines and clean-up costs.

Hence, a reclassification of costs, expenses, and their related assets and liabilities, pertinent to the environment is imminent. In 1995, the International Accounting Standards Committee (IASC) illustrated the use of an environmental asset if it yields a future economic benefit. Environmental liabilities are future contingent costs for clean-up and related lawsuits (Schaltegger and Burritt 2000).

While costs, expenses and capitalizing to assets have been clearly delineated in financial accounting, it is not as easy as applied to environmental costs and investments. In the end, companies end up extracting environmental accounting reports from financial statements instead of integrating it with conventional accounting system.

Environmental Accounting in Japan

The practice of environmental accounting in Japan has been in place for over a decade now. Since 1998, the disclosures of environmental information of publicly listed Japanese corporations have increased steadily from 35 percent to majority practice as a result of the government's initiative - the Environmental Reporting Guidelines (2000) by the Ministry of Environment. While deemed voluntary, the adoption and common practice has established the guidelines as a norm or a standard.

Published in May 2000 and revised in September 2002, the guidelines can be summarized in the following three points: environmental accounting system; environmental conservation cost; and environmental conservation effects and economical effects (Kokubu & Nashioka (2002).

The Ministry of Environment (2002) describes environmental accounting in the following quote:

Environmental accounting aims at achieving sustainable development, maintaining a favorable relationship with the community, and pursuing effective and efficient environmental conservation activities. These accounting procedures allow a company to identify the cost of environmental conservation during the normal course of business, identify the benefits gained from such activities, provide the best possible means of quantitative measurement (in monetary value or physical units) and support the communication of its results.

The guideline (2000) describes environmental accounting as a system that integrates financial performance and environmental performance through correlating the environmental conservation effects and economical effects associated with environmental measures. Kokubu & Nashioka (2002) views environmental accounting according to the guideline, as more likely restricted to the calculation of environmental conservation cost but the range could be expanded into environmental conservation as well as corporate management (Kokubu & Nashioka (2002).

Environmental costs are classified into six categories: (1) business area costs; (2) upstream / downstream costs; (3) management activity costs; (4) research and development costs; (5) social activity costs; and (6) environmental damage costs.

Kokubu & Nashioka (2002) criticize the current practice and see the comparability of these costs amongst companies as not so reliable yet. Companies conforming to the guidelines are left with a lot of discretion in recognizing and reporting environmental costs. However, a comparison of environmental costs and financial figures such as sales is probably helpful in seeing trends in companies' environmental conservation activities.

In a related study by Kokubu, Nashioka and Imai (2002) and Saka (2002), the benefits of environmental accounting were detailed. In a survey of 159 companies in the Tokyo stock exchange the general consensus was environmental accounting is beneficial because it gave management the understanding how much environmental costs incurred. Secondly, management sees the improvement of corporate image while enhancing consciousness within the company. Details of benefits for internal management includes reduction of environmental burden, reduction of environmental costs, development of environmentally friendly products and the improvement of environmental decision making (Saka 2002). These are all consistent with Orlitzky's (2006) theorization of the benefits of environmental accounting.

Toyota' Sustainability Reporting and Environmental accounting

TMC's environmental philosophy is to reduce environmental impact at all stages of vehicle development from production, use, disposal and recycling; while undertaking environmental activities in all business areas. TMC aims to establish environmental systems in all regions and areas of operations and working with related parties in Japan and overseas to implement a consolidated environmental management system and promote environmental awareness on a global scale (TMC Sustainability Report 2008).

TMC's three broad areas of sustainability are: sustainable mobility, sustainable plant initiatives, and sustainable societal contributions.

Sustainable mobility focuses on TMC's core product - automobile manufacturing and its issues related to the environment, safety and traffic congestion through technical innovation. Toyota was the pioneer in introducing hybrid automotive technology that makes the optimal use of energy through gasoline and electricity. On a larger scale, issues on energy and global warming and ultimately a low carbon society is aimed at in this area of TMC's sustainability goals. Porter (2008) sees environmental pollution as equated to inefficiency (incompletely and ineffectively). These are evident in incomplete material utilization and poor process controls, which result in unnecessary waster, defects, and stored materials. Porter (2008) stresses that pollution reveals flaws in the product design or production processes. TMC therefore, works on hybrid technology to make the most efficient use of electricity, low carbon emission, clean gasoline and diesel and development of high performance batteries (Toyota 2009).

Sustainable plant initiatives look closer into TMC's manufacturing and aims to fully utilize natural resources yet in harmony with the natural world. The initiatives include: energy reduction, energy conversion and local community involvement and ecological preservation. Toyota's sustainable model plant (in Tsutsumi) shall be replicated in all overseas plants, ultimately making all plants sustainable (Toyota 2009).

Sustainable social contributions make use of the skills, expertise and technologies that have been developed through business activities. Practical projects supported herein are issues on global warming and biodiversity (Toyota 2009).

Conceptually, Porter (2008) suggests that environmental improvement can benefit resource productivity through process benefits like materials savings, increase in process yields, better utilization of by products, conversion of waste into valuable forms, low energy consumption, reduced material storage and handling costs, savings from safer workplace conditions and elimination of clean up costs. In addition, the product benefits are higher quality, lower production cost, more efficient use of resources, safer products, and lower cost of disposal and higher resale value of products (Porter 2008).

Toyota's sustainability reporting principle involves solving issues related to the environment, safety and traffic congestion through technical innovation, and ultimately, sustainable mobility to society. A pioneer in sustainability reporting, Toyota has participated in the Global Reporting Initiative and in drafting the guidelines of the Japanese framework for the Environment Agency. TMC's sustainability reporting started in 1998 years ahead of the GRI and Japan's own guidelines.

Toyota's Financial Situation

Toyota is primarily engaged in the design, manufacture, and sale of sedans, minivans, compact cars, sport – utility vehicles, trucks and related parts and accessories throughout the world. In addition, Toyota provides financing vehicle and equipment leasing and certain other financial services primarily to its dealers and their customers to support the sales of vehicles and other products manufactured by Toyota. The business segments of Toyota include automotive operations, financial services operations and all other operations. Automotive operations is Toyota's most significant business segment, accounting for 89% of Toyota's total revenues before the elimination of intersegment revenues and 95% of Toyota's total operating costs for fiscal 2008 (Toyota, 2008).

The automotive market in the world is said to be highly competitive and volatile. The demand for this product is affected by a number of factors including social, political and general economic conditions; introduction of new vehicles and technologies; and costs incurred by customers to purchase and operate vehicles. These factors can cause consumer demand to vary substantially from year to year in different geographic markets and for different types of automobiles. Despite the market's competitiveness, the annual report of TMC shows increasing

unit sales from 2006 to 2008, based on the total unit sales of its products all over the world. But, based on the unit sales per geographic segment, there was a decline in the Toyota unit sales in Japan, from 2,364,000 units in 2006 down to 2,188,000 units in 2008. Despite the decline in the unit sales of Toyota's products in Japan, Toyota's market share (including Daihatsu and Hino) including min-vehicles, and Toyota and Lexus' market share excluding mini vehicles, remained at a high level close to prior fiscal year reflecting the sales efforts of domestic dealers (Toyota, 2008).

Toyota had net revenues for fiscal 2008 of ¥26,289.20 billion, an increase of ¥2,341.20 billion, or 9.8% increase compared to prior year. Based on the 2008 annual report of Toyota Motors Corporation, it seems that net revenues increase through the years. This increase principally reflects the impact of increased vehicle unit sales, increased financing operations, increased part sales and the favorable impact of fluctuations in foreign currency translation rates during fiscal 2008. Toyota's net revenues include net revenues from sales of product that increased by 9.5% in 2008, and net revenues from financing operations that increased by 14.9% in 2008 (Toyota, 2008).

Operating costs and expenses of TMC increased by ¥2,309.50 billion, or 10.6%, to ¥24,018.90 billion during fiscal 2008 compared with the prior year. The increase resulted primarily from the impact on costs of products attributed to vehicle unit sales growth and changes in sales mix, impact of fluctuations in foreign currency translation rates, increase in research and development expenses, increased expenses in expanding business operations and increased costs corresponding to the increase in part sales. These increases were partially offset by the net impact of cost reduction efforts, responding to rise in prices of production materials and parts in fiscal 2008 (Toyota, 2008).

Continued cost reduction efforts reduced operating costs and expenses in fiscal 2008 by approximately ¥120 billion, partially offset by increases in the prices of steel, precious metals, non-ferrous alloys including aluminum, plastic parts and other production materials and parts, over what would have otherwise been incurred. These cost reduction efforts relate to ongoing value engineering and value analysis activities, the use of common parts that result in a reduction of part types and other manufacturing initiatives designed to reduce the costs of vehicle production (Toyota, 2008).

Cost of financing operations increased by ¥195.90 billion, or 22.5% to ¥1,068 billion during fiscal 2008 compared with the prior year. The increase resulted primarily from the impact of increased interest expense caused primarily by an increase borrowing attributed to business expansion. The increase is also attributed to the impact of losses due to changes in the fair value of derivative financial instruments that are not designated as hedges and are marked – to – market at the end of each period (Toyota, 2008).

Selling and general administrative expenses increased by ¥17.5 billion, or 0.7% to ¥2,498.5 billion during fiscal 2008 compared with the prior year. This increase mainly reflects

an increase for the financial services operations. The increase for financial services operations is primarily attributed to the impact of increased expenses (Toyota, 2008).

Research and development expenses increase by ¥68.1 billion, or 7.6%, to ¥958.8 billion during fiscal 2008 compared with the prior year. This increase primarily relates to expenditures attributed to the development of environmentally conscious technologies including hybrid and fuel – cell technology, aggressive developments in advanced technologies relating to collision safety and vehicle stability controls and the impact of expanding new models to promote Toyota's strength in a global market to further build up competitive strength in the future (Toyota, 2008).

Toyota's net income increased by ¥73.80 billion, or 4.5%, to ¥1,717.80 billion during fiscal 2008 compared with the prior year. Toyota's ROE decreased from 14.7% in 2007 to 14.5% in 2008. Historically, Toyota has funded its capital expenditures and research and development activities primarily through cash generated by operations (Toyota, 2008).

Toyota expects to sufficiently fund its capital expenditures and research development activities in fiscal 2009 through cash and cash equivalents on hand and increases in cash and cash equivalents from operating activities. Toyota funds its financing programs for customers and dealers, including loans and leasing programs, from both operating cash flows and borrowings by its finance subsidiaries. Toyota also seeks to expand its ability to raise funds locally in markets throughout the world by expanding its network of finance subsidiaries (Toyota, 2008).

For fiscal 2008, the net cash provided by operating activities of TMC decreased because of the increase in cash payments of cost of products sold and increase in payment of taxes. Net cash used in investing activities increased in fiscal 2008 because of the increase in additions to finance receivables, increase in purchases of marketable securities and security investments and the increase in additions to fixed assets. Net cash provided by financing activities in fiscal 2008 decreased because of the increase in repayments of long term debt (Toyota, 2008).

Total capital expenditures of property, plant and equipment, excluding vehicles and equipment on operating leases, increased by 3.8% compared to the prior year. The increase in capital expenditure resulted primarily from the impact of higher investments in subsidiaries located in Japan and North America. Total expenditures for vehicles and equipment on operating leases increased by 1.2% compared to the prior year. This is due primarily to business expansion in the financial services operations (Toyota, 2008).

Based on 2008 annual report, Toyota expects that overall steady growth of the world economy will continue be driven by resource – rich countries and emerging countries in fiscal 2009, despite factors such as concerns about the U.S. economic trend, fluctuations in exchange rates and the stock market, and energy and raw material prices trend (Toyota, 2008).

SYNTHESIS AND RESEARCH GAP

Environmental accounting is still in its early stages of adoption but could be considered an operationalization of the construct of corporate social responsibility. Carroll's (1952) view of discretionary expectations is relevant to Japan's view of environmental protection. The same importance may not be as relevant to other developing countries that could not sacrifice foreign direct investment by upholding environmental laws and regulations. However, considering globalization and power of multinational companies to move CSR further and influence the policies and practices of developing countries, TMC is in the position to set the standard for environmental accounting and reporting.

Steiner (1971) has emphasized that the larger a company grows, the more responsibility it has over its society and this is reflective of TMC's size, geographic scope and environmental activities.

Studies have attempted to integrate sustainability reporting with traditional financial reporting. However, from an external perspective and with the availability of processed information, analyst may not be able to fully adopt the exploratory frameworks.

Environmental reporting in Japan is considered 'voluntary' but the magnitude of adoption is tantamount to being compulsory. The objectives of this paper may therefore become relevant in justifying the costs with the corresponding benefits of environmental accounting. Companies may not be as large or as profitable as TMC but as Steiner (1972) points out, there may be short-run or long-run profitability in being socially responsible.

METHODOLOGY

Using secondary data sources, TMC's annual reports and sustainability reports will be downloaded from the company website. The study shall cover the period 1998 to 2009.

Research procedure. To meet the above objectives, we processed the information qualitatively. With the aid of basic correlation analysis, we can determine whether or not environmental cost moves in the same direction as with economic effects and we can determine whether or not environmental cost moves in the same direction with company's profitability.

Statistical Tools

Using the Minitab, we measured the central tendency, variability and the shape of ungrouped data of environmental costs, economic effects, and profitability ratios. We used a box and whisker plot to determine whether or not there are outliers in the environmental costs, economic effects, profitability ratios data. We also used a scatter graph to check whether there is linear relationship between environmental costs and economic effects, and between environmental costs and profitability. To analyze the degree of association between economic

effects and environmental costs, we used the spearman's rank correlation. Spearman's rank correlation is a nonparametric test, meaning a distribution-free statistics (Black, 2008). Since there are only 11 observations in our study, we deemed to be appropriate not to use Pearson-product moment correlation. It is because we cannot assume that the population of our data is normally distributed since there are only 11 observations, and we cannot say that the variables follow linear relationship (refer to appendix A). The Pearson correlation coefficient is unbiased and efficient, provided that the population is normally distributed. Therefore, we can say that the Pearson product moment correlation coefficient is not robust. Moreover, it is not also outlier resistant and it only measures the degree of linear relationship. To compute for the Spearman's rank correlation coefficient, we used free statistical software downloaded from www.wessa.net. We also used the spearman rank correlation coefficient to discover the strength of a link between environmental costs and profitability. A spearman's rank correlation coefficient of -1 means perfectly negatively correlated. A spearman's rank correlation coefficient of +1 means perfectly positively correlated. While a spearman's rank correlation coefficient of 0 means no correlation at all.

The following profitability ratios shall be computed to indicate profitability: return on sales, dividend per share, and earnings per share. The economic effects (actual effects), measured in reduction of costs, sales of recyclable wastes and other income shall be related with total environmental costs to establish cost benefit. Since these accounts were presumably extracted from financial reports, a test of relevance shall be done to effectively perform a cost benefit analysis. Also, an environmental cost which is the summation of investments and expenses shall be expressed as a percentage of net revenues to weigh its impact on financial performance.

RESULTS, ANALYSIS AND DISCUSSION

TMC' environmental costs have been increasing from 1998 to 2008 along side with revenues. Initially, it can be related that environmental costs are a fixed portion of revenues but analysis below will show otherwise. Environmental costs were from 0.89% of revenues in 1998 to 0.96% of revenues in 2008.

Profitability has been posted at the rate of 3.7% return on sales in 1998, nearly 5% in 2003, and 6.5% in 2008. Toyota's assets have grown to more than double from JPY 14.8, in 1998, to JPY 32.5 trillion, in 2008.

The equity base had gradually decreased from 44.2% of assets in 1998 to 36.6% in 2008. This could be attributed to the expansion of the company to overseas locations through debt financing. In 2008, even if the debt ratio was 63.4%, Japan has a debt-oriented economy and such a ratio could be considered normal since the source of capital come mainly from Japanese banks (Saudagaran 2004).

Toyota's Environmental Report

TMC's environmental accounting in its sustainability report follows Japan's prescribed format for reporting. Environmental costs are divided into environmental investments and maintenance costs, similar to traditional accounting classification of assets and expenses.

Investments, regardless of generally accepted accounting principles, include: research and development (otherwise not classifiable as asset); recycling-related investments; other expenses on social contribution; ISO certification; education and training; and investment in plant and equipment (like any tangible asset but pertinent to recycling, prevention of global warming and eco-efficiency).

Maintenance costs include expenses related to environmental measures of waste processing, waste water treatment, atmospheric pollution and environmental preservation. In addition to the maintenance costs are: awareness building, professional environmental staff and environmental restoration (vehicle recalls and soil and ground water remediation).

Included in the TMC's sustainability report are its economic effects of environmental accounting. Those are the economic benefits of environmental costs & investments measured into reduction in energy costs, reduction in waste processing costs, sales of recyclable goods, and other income from environment related technologies.

Data Analysis

We measured the central tendency, variability and shape of the data. We also determined the degree of association between variables using Spearman's rank correlation coefficient.

From 1998 to 2008, TMC's average environmental cost is JPY 187.25 billion, while its median is around JPY 201.60 billion. The dispersion of yearly environmental cost incurred by TMC around its mean has an average of JPY 69.92 billion. Based on the box and whisker plot shown on Appendix A, there are no mild nor extreme outliers which may affect the computation of the mean and in the end affect the computation of Spearman's correlation coefficient. Hence no remedies are needed to eliminate the outliers. The box and whisker plot showed that the distribution of the data is negatively skewed.

From 1998 to 2008, TMC's average economic effect is JPY 8.3545 billion, while its median is around JPY 5.8 billion. The dispersion of yearly economic effect around its mean has an average of JPY 5.1306 billion. Based on the box and whisker plot shown on Appendix A, there are no mild nor extreme outliers which may influence the computation of Spearman's correlation coefficient. It is also shown that the economic effect is positively skewed.

Based on the scatter plot of economic effects and environmental costs shown on Appendix A, the said variables do not seem to follow a linear relationship. Hence, it may be appropriate to use Spearman's rank correlation coefficient.

Table 1 Result of Spearman's rank correlation coefficient – environmental costs and economic effects	
Statistic	Value
Correlation (not corrected)	0.85
Correlation (corrected)	0.85
t-Test (n>10)	4.88
Degrees of Freedom	9.00
Critical 2-sided T-value (5%)	2.26
Critical 1-sided T-value (5%)	1.83
D-square value (calculated)	32.50
D-square value (expected)	220.00
Standard Deviation	69.57
z-Test	-2.70
Probability	0.01
Observations	11.00
Source: Wessa, P. (2010), URL http://www.wessa.net/	

To prove our first alternative hypothesis that economic effect has significant positive correlation with environmental costs, we used Spearman's rank correlation coefficient to test the hypothesis. As mentioned in the research design section, we used a free statistical software to compute for the Spearman's rank correlation coefficient. The critical t-value for a one tailed test, with alpha equivalent to 0.05 is 1.83. Therefore, if the observed t-value is greater than the critical t-value, then, environmental cost has a significant positive effect to economic effect.

After plugging the data into the software, we were able to obtain the Spearman's rank correlation coefficient of environmental cost and economic effect. The coefficient of correlation is 0.85, indicating that there is a positive correlation between the said variables. Is the relationship significant? Yes. The positive relationship between economic effect and environmental cost is significant because the observed t-value, as per Table 1 above, generated in the process is 4.88 which is more than its critical t-value of 1.83. Further, we can say that the degree of association between economic effect and environmental cost is somewhat strong. .

From 1998 to 2008, TMC's average net revenues, ROE and dividend per share is JPY 16,967 billion, 10.94%, and JPY 56.273 per share, respectively. The dispersion of yearly net revenues, ROE and dividend per share around the mean is JPY4,970 billion, 3.51% and JPY 42.26 per share, respectively. There are no outliers found in the dataset for net revenues, ROE and dividend per share. Moreover, all are positively skewed, except ROE.

To prove our second alternative hypothesis that profitability has significant correlation with environmental costs, we again use spearman's rank correlation coefficient. Each

profitability measurement was tested separately for correlation with environmental cost. The following are the details in relation to the result of the test:

Table 2			
Spearman's rank order correlation – profitability measurements with environmental cost			
	Net Revenues	Dividend per share	ROE
Correlation (not corrected)	0.96	0.96	0.86
Correlation (corrected)	0.96	0.96	0.86
t-test n>10	10.82	10.46	5.14
Degrees of freedom	9.00	9.00	9.00
Critical 2 sided t-value	2.26	2.26	2.26
Critical 1 sided t-value	1.83	1.83	1.83
D-square value (calculated)	8.00	8.50	30.00
D-square value (expected)	220.00	220.00	220.00
Standard Deviation	69.57	69.57	69.57
z-Test	-3.05	-3.04	-2.73
Probability	0.00	0.00	0.01
Observations	11.00	11.00	11.00
Source: Wessa, P. (2010), URL http://www.wessa.net/			

Since the observed t-values of net revenues, dividend per share and ROE are greater than the critical 2-sided-t-value, treated separately, therefore there exists significant evidence against the null hypothesis. Therefore, based on the test of significance for spearman's correlation coefficient, there is significant positive correlation or association between net revenues and environmental cost, between ROE and environmental cost, as well as dividend per share and environmental cost. Net revenues and dividend per share has the strongest correlation with environmental cost.

One major criticism on CSR practices is the distribution of ultimate shareholder wealth to the public. However, the test of correlation on environmental costs and return on equity (and or dividends per share) shows positive relationship. This could suggest that environmental activities contribute to shareholder value, thus, strengthening the Shareholder Value Theory.

However, the results of the Spearman's rank correlation coefficient are not conclusive as to determine the causality between profitability and environmental cost. Environmental cost is not the only explanatory variable that explains the changes in profitability of the firm, nor can we say that profitability explains environmental cost. Determination of causality between variables requires the creation of a regression model and subjects it to more complicated statistical test to generate the best linear unbiased estimators. Care should be taken in interpreting the results of Spearman's rank correlation coefficient.

Environmental cost is the sum of environmental expenses and investments in assets. These absolute amounts published in TMC's sustainability reports could be weighed with the conceptual, empirical and actual benefits measured in cost savings.

The benefits in the form of cost savings and other income totaled JPY 10 billion in 2005, JPY 13 billion in 2006 and JPY 15 billion in 2007. These would, otherwise, have gone into waste had TMC not engage in environmental accounting. If compared with the environmental costs, the measurable ratio benefits would amount only from 5% to 6%.

However, as Orlitzky pointed conceptually, the benefits could range from efficiency, increasing competitors' costs, attracting more productive workforce, boosting sales revenues, and reducing business risk. More importantly, there are strong theoretical arguments for the reverse causation of financial performance and corporate citizenship (Orlitzky 2008).

The tangible benefits were cited likewise by Porter (2008) but he was more specific on materials savings, increase in process yields, better utilization of by products, conversion of waste into valuable forms, low energy consumption, reduced material storage and handling costs, savings from safer workplace conditions and elimination of clean up costs. In addition, the product benefits are higher quality, lower production cost, more efficient use of resources, safer products, lower cost of disposal and higher resale value of products (Porter 2008).

CONCLUSION

In the foregoing discussion, there are many benefits of environmental cost both conceptually and empirically based. Based on the results and discussion, as well as data analysis, we found that there is significant correlation between economic effects and environmental costs. In addition, there is a significant correlation between profitability and environmental costs.

This study described Toyota Motors Corporation's environmental accounting within Japan's prescribed guidelines and focused on the environmental costs and benefits. The measurable costs have outweighed the direct tangible benefits but there are suggestions of indirect benefits. After conducting correlation tests, it figured that economic effects are significantly positively correlated with environmental cost. Meaning, if environmental cost increases, we can also see that economic effect increases as well, or if the environmental cost decrease, the economic effect also decreases and the probability of them increasing or decreasing together is not due to chance.

Since economic effects is included in the computation of net income and later on closed to equity, it can be inferred that ROE will also be affected with the increase in environmental cost. Such relationship was tested using Spearman's rank correlation and the test showed that there is indeed a significant correlation between ROE and environmental cost. It is important to note that the test only showed whether there is a significant correlation between the variables. The test does not show whether the change in environmental cost will cause a significant or material change in the financial performance of the business. The least is that our test could

suggest causality between the variables but further test should be done to establish so. Meanwhile, literature point to causality and reverse causation between corporate citizenship and financial performance (Orlitzky 2008). Moreover, our test showed that net revenues and dividends per share are significantly correlated with environmental cost

Orlitzky (2008) and Porter (2008) have both highlighted the benefits of cost efficiency, savings from recyclable materials and by products and boosting sales with the company's reputation of engaging in high quality production systems that minimize waste and harm to the environment.

RECOMMENDATION

Further studies should be made, such as regression analysis, to establish causality between environmental cost and economic effect and to establish causality between environmental cost to company's profitability. Since TMC has published data for environmental cost and economic effect for more than 10 years, time series study should be done to better understand the effect of environmental cost to economic effect and company's profitability.

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APPENDIX A





