



## A Proposed Model for Evaluating Sustainable Performance as a Requirement of Sustainable Development: A Theoretical Framework

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**Abstract:** Nowadays, firms are challenged by sustainability as an imperative issue for its stakeholders. This paper aims to propose a model for sustainable performance evaluation by integrating sustainability indicators in the performance evaluation process to enable measuring the contribution of firms to sustainability. The main concern of this paper is identifying sustainability concepts, its dimensions and determining which developments should be included in the performance evaluation systems to keep up with changes in the business environment. Through a survey of literature that addressed developments in performance evaluation models, results showed the need to integrate environmental, social and economic/financial sustainability measures within the key performance indicators in a way that help achieving the stakeholders' needs and at the same time improve the sustainable performance.

**Keywords:** Indicators, Performance evaluation, Sustainability.

### 1. Introduction:

Performance evaluation of firms is one of the most difficult tasks facing financial managers, particularly in light of the changing business environment. The concept of sustainability, its various dimensions and the focus on environmental and social issues led to many challenges faced by firms to keep up with these concepts and play a positive role towards the society and the environment. It led to the need to develop performance evaluation systems

and tools to determine the firms' role of achieving sustainability and achieving the needs of stakeholders. The research paper is organized as follows; section two discusses the concepts of performance evaluation and sustainability; section three presents the literature review; section four presents the proposed model for evaluating sustainable performance including the objectives, dimensions, and indicators; section five concludes.

### 2. Background:



This section presents a theoretical overview of the main concepts of the research paper which includes the performance evaluation systems, sustainability and performance evaluation, and sustainability dimensions.

### **2/1. Performance Evaluation**

#### **Systems:**

Performance evaluation is one of the topics that received considerable attention by academics and researchers (Salem, 2012). Performance measurement involves measuring the efficiency and effectiveness of the work process (Neely et al., 1995). The concept of performance evaluation is more comprehensive than the concept of performance measurement with regard to the continuous improvement of performance. The process of improving performance requires crystallizing a clear picture of performance by relying on the use of standards for measurement and indicators for evaluation. These standards and indicators emanate from established goals, which should be consistent with the needs of the stakeholders.

Previous research has explained that performance evaluation systems must have several aspects to be effective in achieving their objectives. Among those features are the simplicity, ease of use, and clarity of their objective. These systems should provide feedback quickly so that problems can be remedied. They should also aim to improve performance and not to control it, support the established strategy and not contradict with it, be linked to each objective of the firm, and in line with its vision. Performance evaluation systems need to be consistent with the incentives and rewards of the firm, focus on the

interests and desires of customers, determine the numeric criteria for most of the targets set, reflect the financial and non-financial information, reduce deviations between the objectives of both the firm and performance measures to a minimum (Guansekaran et al, 2001; Gomes et al., 2004; Tangen, 2004; Thakkar et al., 2007).

### **2/2. Sustainability and Performance Evaluation:**

The concept of sustainable development has begun to emerge during the Stockholm Conference in 1972, which was themed on the Human Environment. The conference was organized by the United Nations, which was the first step towards a global concern for the environment and human rights. The conference discussed for the first time the environmental issues and their relationship to the reality of poverty and the lack of development in the world. It has been announced at the conference that the poverty and lack of development are the greatest enemies of progress.

In 1987, a report was issued by the World Commission on Environment and Development (WCED) which was entitled "Our Common Future". The report pointed out the need to include the concept of sustainable development to achieve environmental protection as well as achieving societal and financial advantages. Sustainable development was defined as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (World Commission on Environment and Development, 1987).

### **2/3. Sustainability dimensions:**

Aras and Crowther (2009) explained that sustainability revolves around four main



dimensions. The first dimension is *societal influence* which is a measure of the impact that society makes upon the firm in terms of the social contract and stakeholder influence. The second dimension is *environmental impact*, which is the effect of the actions of the firm upon its geophysical environment. The third dimension is the *organizational culture*, which is the relationship between the corporation and its internal stakeholders, particularly employees. The fourth dimension is *finance*, which is the adequate return for the level of risk undertaken. These four dimensions are considered key dimensions of sustainability, which are equally important.

The multiplicity and diversity of the dimensions of sustainability, and the growing role they play in the process of creating value for the stakeholders, and to support the competitive advantage of the firm, necessitated the development of a performance evaluation model that combines business activities related to different dimensions of sustainability, and their associated impact on the decision-making process. Although it may seem at first glance that these dimensions achieve a balance in performance in an easily measured way; however, the problem that has been facing many firms is how to translate these dimensions in the form of daily business operations to help improve the performance of the firm.

There are many accounting studies (Bieker and Waxenberger, 2002; Figge et al., 2002; Dias-Sardinha and Reijnders, 2005) that have realized the need to integrate sustainable development dimensions in performance assessment models. Those studies adopted developing a balanced assessment of

performance by using a model of sustainable development dimensions, for both the environmental and social dimensions.

One of the drawbacks of traditional performance evaluation models is the difficulty of defining the accounting measures of sustainability, especially in the absence of a general framework that can be relied upon for this purpose, which requires a trend towards the use of methods of multidimensional measurement, without being restricted by financial measurement methods (one-dimensional measures). Epstein (2008) highlighted the need to use non-financial measures to express the actual levels of environmental and social performance to achieve the targeted strategies.

There is a need to develop an accounting model for performance evaluation systems to give a comprehensive picture of the performance of the firm, and its ability to achieve sustainable development.

### 3. Literature Review:

By analyzing the studies that dealt with the performance evaluation models using the indicators of sustainable development, it is clear that the views of these studies attempted to develop a performance evaluation model based on indicators of sustainable development have been divided into two main directions. The first direction included studies that developed a performance evaluation model based on the basic model of the Balanced Scorecard for performance, which included indicators of sustainable development, whether environmental or social, such as the studies of Sidiropoulos et al. (2004); Dias-Sardinha and Reijnders (2005); Hubbard (2009); Rabbani et al. (2014).



There were several reasons for the existence of this direction. First, the balanced scorecard model included internal and external stakeholder perspectives, addressing long and short term issues, which means that it can be used to measure the performance of firms in different dimensions of sustainability. Second, the Balanced Scorecard model is based on translating the objectives, vision and strategy of the firm into a number of indicators and thus the objectives and strategy of the firm can be linked to sustainable development indicators. Third, the model has received great attention at the theoretical and practical level and has proved effective in assessing both financial and non-financial performance. However, with the development of the modern business environment and the emergence of concepts of sustainable development, it is necessary to develop it in line with these developments.

The other direction of previous studies sought to formulate a stand-alone performance evaluation model based on sustainable development dimensions and indicators without the need to use a balanced scorecard model for performance (Perrini and Tencati, 2006; Bonacchi and Rinaldi, 2007). There were several reasons for the existence of this direction. First, the integration of the relationships between the dimensions of sustainable development as cross-cutting relationships covering the financial, social and environmental aspects can form the basis for the performance evaluation model if sustainability is the adopted strategy of the firm, it has all stages of derivation and selection of performance indicators to suit the nature of the activity of the firm. The number of indicators and dimensions in the

performance evaluation system should be reduced in order to decrease the cost of implementation and simplify the procedures of the system.

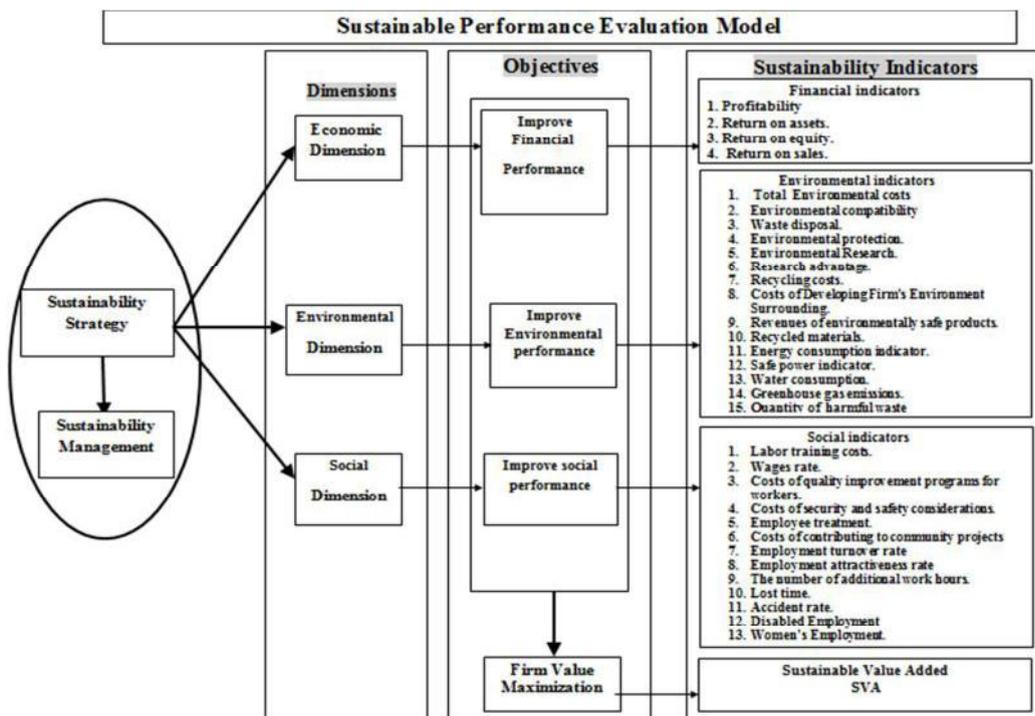
Second, despite the various proposed models for performance evaluation, all of them were theoretical models limited to proposing the theoretical framework of evaluation and were not tested in practice, except for the study of Rabbani et al. (2014) which attempted to integrate its proposed model with new analytical methods to be tested on Iranian oil firms, and the study Dias-Sardinha and Reijnders (2005) which applied its proposed model to a number of Portuguese firms. It can be observed that the accounting literature had no general consensus on an optimal performance evaluation model using sustainable development indicators. Consequently, a research gap arises as to how the performance evaluation model is being developed as well as the lack or scarcity of studies on the reliability of sustainable development indicators in assessing the performance of firms.

Based on the above, the research problem can be crystallized in the inability of the accounting literature to formulate precisely an integrated performance evaluation model that includes the indicators of sustainable development.

#### **4. The Proposed Model for Evaluating Sustainable Performance:**

The proposed model of this study integrates the sustainability strategy, its dimensions and indicators to achieve a number of objectives that eventually contribute to maximizing the value of the firm. These components are presented in Figure (1) and are then explained in details.

Figure (1) The Proposed Model for Sustainable Performance Evaluation



**4/1. Sustainability Strategy:**

For a firm to adopt a sustainability strategy, this requires that the concept and principles of sustainable development must be embedded in the firm's culture and throughout all of its managerial and executive levels. Munier (2005) defined the sustainability strategy it as "a future vision that provides the firm with a business road map and helps it focus its attention on a group of values and ethical principles that guide all their actions". Kumar et al. (2012) urged that sustainability is a long-term vision that addresses the development of a development strategy based on the ethical practices of firms. Artiach et al. (2010) highlighted that sustainability is a business strategy that seeks to use the

best business practices, balancing the needs of current and prospective stakeholders. The adoption of sustainable development as a strategy reflects the future direction of the firm to ensure its commitment to all measures of achieving sustainability and to make maximum efforts to implement this strategy. This ensures its success in applying the proposed model to evaluate its sustainable performance, which seeks

to achieve improvement in all dimensions of sustainable development. It also adds value to the firm and



supports its sustainable competitive advantage.

#### **4/2. Sustainability Management System:**

It can be argued that due to the challenges and developments of the modern business environment and the trend towards sustainable development as one of the requirements of the present time, firms seek to improve their sustainable performance by relying on a sustainability management system that contains a number of tools aimed at supporting managers in different managerial levels. This leads to reducing the negative environmental and social impacts of firms, sustain positive impacts, while maintaining the competitiveness and success of an enterprise economically. They enable the implementation of sustainability-oriented strategies and the coordination of activities at all levels of the firm (Johnson and Schaltegger, 2016). Sustainability Management System is therefore one of the factors of the successful implementation of the proposed model for evaluating sustainable performance because it is important to provide all the information needed by the proposed model when calculating the indicators.

#### **4/3. Model Dimensions:**

The achievement of sustainable development must be based on synergies in the social, environmental and economic areas, and each of the three areas must include a number of integrated activities to achieve sustainable development (Yuliastut, 2017). Thus, designing an integrated performance evaluation model based on sustainable development indicators should integrate sustainability with the overall strategy of the firm and the

dimensions of sustainability that the firm should pursue, and then translate these dimensions into a number of objectives that the firm seeks to achieve. It is only a tool to make sure that a firm achieves its goal and correct undesired distractions.

#### **4/4. Model Objectives:**

There are four main objectives for the proposed model that stem from the nature of the dimensions of sustainable development upon which this model is based. These objectives are improving financial performance, improving environmental performance, improving social performance, and maximizing sustainable value added.

#### **4/5. Model's Indicators:**

The proposed model for evaluating sustainable performance is a balanced model based on translating the strategy and objectives of the firm into a number of integrated indicators. This can be used to measure the role of the firm in achieving sustainable development as one of the requirements of the modern business environment. The model indicators are grouped into four main groups which are Financial/Economic Performance Indicators, Environmental Performance Indicators, Social Performance Indicators, and Sustainable value added index of the firm.

#### **First: Financial/Economic Performance Indicators (FPIs):**

Based on Castro and Chousa (2006), the financial/economic performance indicators include profitability measures, return on assets (ROA), return on equity (ROE), and return on sales (ROS).



**Second: Environmental Performance Indicators EPIs:**

Environmental performance indicators can be divided into monetary environmental indicators and non-monetary environmental indicators.

**A. Monetary Environmental Indicators:**

They refer to the costs and returns associated with environmental impacts as well as the management of the environmental activities by the firm, and thus they should be integrated into the accounting system of the firm. These indicators are illustrated in Table (1) (Epstein and Wisner, 2001; Hubbard, 2009; Mamede and Gomes, 2013; Hummel and Schlick, 2016).

**Table (1)  
Monetary Environmental Indicators**

Indicator	Equation
Total Environmental Costs	Total environmental costs incurred by the firm ÷ Total costs
Environmental Compatibility	Amount of fines due to environmental violations ÷ Total environmental costs
Waste Disposal Costs	Waste and waste disposal costs ÷ Total environmental costs
Environmental Protection	Capital costs of environmental protection of equipment and assets ÷ Environmental costs
Environmental Research	Environmental Research and Development Costs ÷ Total Environmental Costs
The Benefit of Environmental Research	Revenues of green products ÷ Costs of environmental research and development
Recycling Costs	Costs spent on recycling of water and materials used in production ÷ Total environmental costs
Costs of Developing Firm's Environment Surrounding	Amount of costs spent on afforestation and paving operations ÷ Total environmental costs
Revenue of Environmentally Safe Products	Sales revenue generated from environmentally safe products ÷ Sales revenue

**B. Non- Monetary Environmental Indicators:**

These indicators are concerned with evaluating the environmental performance expressed in quantitative form, where they are concerned with quantities of materials, energy inputs and the amount of output from the production process. These indicators are presented in Table (2).



**Table (2)**  
**Non- Monetary Environmental Indicators**

Indicator	Equation
Quantity of Recycled Materials	Quantity of recycled materials ÷ Total quantity of materials used in production
Energy Consumption	Amount of renewable energy used in the production process ÷ Total amount of energy used in production
Safe Energy	Amount of energy used from environmentally safe sources ÷ Total amount of energy used in production
Water Consumption	Quantity of recycled water used in cubic meters ÷ Total quantity of water used in production
Greenhouse Gas Emissions and Harmful Gases	The amount of emissions of greenhouse gases and harmful gases ÷ The standard level of those emissions according to the laws of the environment
Quantity of Harmful Waste	Quantity of harmful waste ÷ Quantity of production units

**Third: Social Performance Indicators (SPIs):** Social performance indicators are those indicators that are concerned with assessing the performance of the firm in the social activities and social aspects. They can be classified into monetary and non-monetary social indicators. Table (3) presents the monetary social indicators while Table (4) presents non-monetary social indicators. (Epstein and Wisner, 2001; Hubbard, 2009; Mamede and Gomes, 2013; Hummel and Schlick, 2016).

**Table (3)**  
**Monetary Social Indicators**

Indicator	Equation
Labor training costs	Amount spent on training programs for employees ÷ Total social costs
Wages rate	Total annual wages ÷ Total number of employees
Quality of life for workers	Amount spent on workers' services ÷ Total production costs
Security and safety considerations	Total security and safety amounts ÷ total production costs
Costs of treatment of workers due to work injuries	Costs of treatment and compensation for work injuries during work ÷ Total costs of security and safety considerations
Costs of contribution to community and charity projects	Amounts of donations and contributions to community and charitable projects ÷ Total social costs



**Table (4)**  
**Non-Monetary Social Indicators**

<b>Indicator</b>	<b>Equation</b>
Employment turnover during a specified period	Number of employees terminated during the period ÷ Total number of employees during the period
Employment indicator	Number of Employees in the Current Year ÷ Number of Employees in the Last Year
Lost time indicator	Total number of work hours lost due to injuries and accidents ÷ Total number of hours worked during the year
Additional work hours indicator	Number of additional work hours ÷ Total number of actual work hours or Number of additional work hours ÷ Value of bonuses and incentives for extraordinary efforts and overtime
Accident rate indicator	Number of accidents occurring during the year ÷ Actual hours worked during the year
Employment of Disabled Persons	Number of Employees with Disabilities ÷ Total Number of Employees
Women's employment	Number of women workers ÷ Total number of employees in the firm

**Fourth: Sustainable Value Added indicator of the firm:**

The sustainable value added approach calculates the sustainable value of the firm through five basic steps as follows (Figge and Hahn, 2002; Müller et al., 2012):

**1. Calculate the efficiency of the firm:** how it uses its economic, environmental and social resources to create value for the shareholder. It is calculated in 3 sub-steps as follows:

**A. Calculate Economic Efficiency:** Divide one of the financial indicators of performance, such as net profit after taxes, by total assets of the firm to reflect economic resources.

**B. Calculate Environmental Efficiency:** Divide net profit after taxes by the amount of emissions of harmful gases such as carbon dioxide resulting from the activity of the operating firm, as

it is found that each pound of profit achieved cause a certain amount of emissions of harmful gases. Similarly, net profit can be divided by the quantity of harmful waste from production.

**C. Calculate Social Efficiency:** Divide net profit after taxes by the number of accidents and injuries to employees during work. It is found that each pound of profit earned cause a certain number of accidents or injuries.

**2. Benchmark Firm Efficient Calculation:** By implementing the previous three sub-steps for the benchmark firm.

**3. Calculation of the Value Spread,** which results from the calculation of:

**A. Economic value spread** = the difference between the economic efficiency of the firm being evaluated and the environmental efficiency of the benchmark firm.



**B. Environmental value spread** = the difference between the environmental efficiency of the firm being evaluated and the environmental efficiency of the benchmark firm.

**C. Social value spread** = the difference between the social competence of the assessed firm and the social competence of the benchmark firm.

Comparisons are then made between the performance of the evaluated firm and the benchmark firm using the three values. If the values are positive, this indicates that the efficiency of the concerned firm exceeds the benchmark firm in using its resources and vice versa if the value is negative for any of these values.

#### 4. Determine Resource Value Contribution:

A firm can determine which economic, social or environmental resources are used to achieve positive value and which resources affect negatively the realization of value. This can be done using the following three equations:

- **Value of economic performance = the economic value spread calculated in step 3 × total assets.**

- **Value of environmental performance = environmental value spread calculated in step 3 × the quantity of harmful emissions.**

- **Value of social performance = social value spread calculated in step 3 × number of employment accidents.**

Negative product signifies bad performance while positive product signifies good performance. The researcher believes that this indicator has the ability to transfer non-financial data, which reflect the performance of

environmental or social figures, to financial explanations of the extent of improvement of the value of the firm as a result of this performance without neglecting any aspect of environmental or social performance. This indicator is used in the proposed model as a unique model for measuring value by relying on it and using the data referred to in both environmental and social indicators to calculate the amount of realized value of the firm. It strengthens the capacity of the proposed model to achieve the objective of maximizing the value of the firm. It also minimizes the undesirable negative impact of each social or environmental performance item, which increases the added value indicator and makes it more successful.

The proposed model combines a number of indicators which aims at measuring sustainable performance with its various dimensions and its impact on the value of the firm.

This proposed model has several advantages. First, it rationalizes the management decisions of the firm with regard to optimizing the organization's plans and policies towards resource utilization and improving sustainable performance. Second, it improves the environmental quality of the products of the firm and reduces the negative impact of the activities of the firm on the environment. Third, it strengthens the capabilities of employees and achieves some kind of communication between them and the management of the firm, it raises the degree of loyalty and belonging by improving morale and work in a safe environment, and an administrative policy to adopt their proposals to develop the firm and raise its efficiency. Fourth, it contributes to the development of society effectively either through



supporting the social activities of the state, or by supporting community-based non-governmental organizations (NGOs). Fifth, it improves the reputation of the firm and thus strengthens the competitive advantage of the firm compared to its competitors. Finally, the proposed model improves the sustainable performance of the firm in its three aspects (financial, environmental and social) which maximizes the value achieved by stakeholders.

#### 5. Conclusion:

Performance evaluation is one of the most critical processes, and it is one of the basic demands that firms need to carry out to achieve their objectives, as they mirror the progress of performance of the firm. The business environment is characterized by the continuous change, which requires the need to develop methods and practices of management accounting in general and performance evaluation systems in particular, to keep up with the changes that occur in the business environment.

In the last decade, many environmental and social concepts and issues have emerged that have clearly influenced the society's understanding of the role that firms should play in order to preserve the environment, achieve community stability and contribute to the value of stakeholders. One of the most important concepts is sustainable development, which captured the interest of researchers, international conferences and global initiatives in order to define its objectives and dimensions. These developments constitute a challenge for firms to develop their strategy and objectives and then evaluate performance systems which they depend on to keep up with those developments. This paper presented a performance evaluation

model that combines the dimensions of sustainable development with its indicators and how they can be linked to the objectives of the firm. The model forms an integrated performance evaluation system that helps the firms increase their role towards sustainable development.

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