

## The Effect of Environmental Accounting on Financial Indicators of Service Companies

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### Abstract

Nowadays, according to some environmental restrictions, particularly in the World Trade and intense competition, we all agree that business managers are under increasing pressure that not only they should reduce operational costs but also they should minimize the environmental effects of operational activities. This pressure is from groups such as shareholders, government, media, consumers, investors and other organizations. Companies to reduce the environmental effects of their operational activities, have no choice to enter environmental costs in their accounts and decisions. Pressure intensifies on natural systems and Earth Resources. The sad reality is that the economy continues to grow but the environment that the economy depends on it does not grow. The purpose of this study is to investigate the environmental accounting on the financial and operational indicators and to determine the position of accounting. In this study, T-Student test is used to confirm or reject the hypotheses. Friedman test is used to evaluate the effectiveness and effect of each factor. T-Paired test is used to compare the expected level with the actual level. The results indicate the effect of environmental accounting on the financial and operational indicators of companies and total debt of service companies.

**Key Words:** Environmental Accounting, Financial Indicators, Operational Indicators..

### Introduction

Plagner (2004) believe that hard work in the combination of natural sciences and social sciences is to represent the relationship between existing systems in the world; as well as the debate that the world is dealing with and it is global warming. According to the researchers, its main cause is greenhouse gas emissions. Developing countries and China insist on economic progress of their countries by any means based on economic and social sciences but environmental scientists insist on environmental problems caused by it based on natural sciences which are the warming by greenhouse gas emissions that are produced by service factories.

It is hoped that the results of this study (The Effect of Environmental Accounting on Financial and Operational Indicators of Service Companies) create a logical relationship between financial growth and increasing of environmental criteria and help to the companies in using the methods which pay more attention to the environmental issues.

According to Anderson and Wolf (1996), industrial world consists of 3 main parts producers, consumers and government that all of these components are responsible and effect on the society and environment in different ways and can be a separate issue to be investigated in a study. In this study, the focus is on the accounting in production units and making better decision to improve environmental performance of companies.

The strategy discussed in this study pays attention to the future changes and threats which can create new and more costs for business. The applied operational strategy, deals with the costs that the company incurred but not aware of its extent and value. This strategy can be used to save costs and in other proposed methods in order to manage the costs (Boritt and Saka, 2006).

It is expected that in the future environmental costs are created which are caused by the external pressure from

government and customers.

### Theoretical Framework and Literature Review

The purpose of environmental accounting is to provide information that help managers in performance evaluation, control, decision making and report to an organization or a region. Environmental accounting based on the concepts is environmental and economic criteria and values. To achieve this goal, change in the culture is required which a part of this change can be achieved by environmental accounting and reporting. Environmental accounting provides information which helps managers in performance evaluation, control, decision making and reporting. Environmental accounting is based on the economic and environmental concepts and since it uses values that do not come from the market, it requires a change in culture. Environmental accounting provides some parts of these changes in the organization and society. And it helps to determine the purpose of continuous development as a special approach.

With regard to environmental management accounting study entitled "Environmental Management Accounting" has been done which has tried to define the conceptual framework of environmental management accounting. Finally it is tried to show the evolution of the conceptual framework (Molla Nazari, 2013).

Bennett and Mabts (2010) have written an article as "Cost Reduction through Environmental Management Accounting". This article is the combination of different opinions of accounting and the environment communities such as Committee of Public Accountants, Institute of Management Accountants (IMA), Environment Representative Office, Environmental Management Accounting Network in relation to the effect of Environmental Management Accounting on cost of products and reducing it.

Graz (2006) has published an article as "Environmental Management Accounting and Clean Production". This article

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refers to the effect of Environmental Management Accounting on the consumption of materials and energy so that in addition to the optimized consumption, reduces waste production.

A research has been conducted as "Sustainable Development and Environment Management System in the Czech Republic". The purpose of this study is the concept of environment management in Czech Republic. In this study, the importance of environmental management system in sustainable development has been investigated (Hyršlová et al, 2007).

In a research, Nakagami in Vietnam emphasizes on attention to environmental issues to achieve sustainable development.

In this context, a study is conducted by Richardson and Mogensen (2005) as "The Prospects for the Development and Application of Environmental Management Accounting.

Jasch (2002) has done a lot of researches on environmental management accounting. In one of these researches as "Using environmental management accounting for environmental cost measurement", he proposes some models for estimating environmental costs for companies through environmental management accounting. In this study, the emphasis is on the need to visualize environmental costs and to remove these costs.

Arab Salehi, Sadeghi and Moeineddin (2013:1) in a research as "The relationship between social responsibility and the financial performance of companies admitted in the Tehran Stock Exchange", evaluate the social responsibility toward customers, environment and society (educational institutions, cultural institutions, sports institutions, health organizations, hospitals, charities, rehabilitation centers, etc.) by a questionnaire with 53 questions. Information from 59 companies during the years 2006-2010 is used. The results show that there is a relationship between financial performance social responsibility toward customers and society but there is NO significant relationship between financial performance social responsibility toward customers and environment.

Ghazizadeh (2013) in a research as "Identifying the relationship between corporate responsibility and customer loyalty (Case study: Mellat Bank)" investigates the effect of social responsibility on customer loyalty.

Babajani and Foroghi (2003) hav conducted a research as "Evaluation of the accounting system accountability to the social responsibility of profit units". In this study, by using the Delphi method, eight main and important factors were identified as acceptable criteria for raising the level of accountability of the accounting and financial reporting system of Iran's profit units. Based on the accepted criteria and based on the privileges attributed by members of the Delphi group to the present situation of each of these factors, it is revealed in the current system of accounting and financial reporting of Iran's profit units that the current system of accounting and financial reporting of Iranian profit units has NO expected capabilities to respond to social responsibility.

Salewski and Zülch (2014) in their research investigate the relationship between disclosure of corporate social responsibility and the quality of profit. The result of this study indicates that the growing trend of companies to disclose corporate social responsibility information does not necessarily lead to an increase in the quality of profit. And there is a negative relationship between disclosure of corporate social responsibility

and the quality of profit. Also the results show that there is a negative relationship between corporate social responsibility and conservatism degree of the company and quality accruals and there is a positive relationship between corporate social responsibility and profit management.

Oeyono et al (2011: 100) in a study as "Corporate Social Responsibility and Financial Performance" investigate the corporate social responsibility of 50 Malaysian companies. Their analysis shows that there is a positive and weak relationship between corporate social responsibility and financial performance. Therefore, they claim that reporting of corporate social activities improves financial performance.

Arshad and Razak (2011: 25) have conducted a research as "Disclosure of Corporate Social Responsibility and Performance of Malaysian Companies". The results show that disclosure of social responsibility activities of companies has a significant effect on companies' success. Also, the dominant ownership structure improves the activities of disclosure of social responsibility.

Sikka (2011:811) in a research as "Investigating the application of sustainable accounting guidelines on the continuation of the activities of companies admitted in the Thai Stock Exchange" has concluded that there is a direct and positive relationship between continuity of activities and survival of companies that are required to submit reports by respecting to the sustainable accounting standards.

Choi et al (2010: 291-311) have conducted a research among 1222 Korean companies. The results indicate that there is a significant and positive relationship between social responsibility and financial performance.

### **Research Purposes**

The overall purpose of this study is "Investigating the Effect of Environmental Accounting on Operational and Financial Indicators of Service Companies". Different views of university professors about the impact of the environmental accounting system on the operational and financial indicators of service companies are considered that Does environmental accounting affect the operational and financial indicators of service companies or not?

Chauhan (2005) and Boyd (1998) define environmental accounting as the identification and reporting of specific environmental costs. Environmental accounting goes beyond accounting of costs and environmental benefits which includes accounting for costs and benefits resulting from changes in products or processes of the company and also includes changes in environmental effects. It is not necessary that environmental accounting data be a product of accountants, but also it is any information with explicit or virtual financial content that is used as decision-making bodies in the company. Product designers, financial analysts and managers are users of environmental accounting information.

The main purpose of this study is to investigate the effect of environmental accounting on operational and financial indicators of service companies.

In this regard, the hypotheses of the research are as follows:

1) Environmental accounting affects the service measures of service companies.

2) Environmental accounting affects the service methods of service companies.

3) Environmental accounting affects the annual energy consumption of service companies.

For this reason, the variables of research can be summarized as follows:

**Environmental Costs:** Generally, environmental costs are divided into these main categories: Costs related to company products, Costs related to not earned products, Costs related to production wastes, Costs related to avoiding environmental damage and Research and Development (R & D) Costs related to environmental issues.

**Annual Energy Consumption:** Which is the amount of energy (in the form of liquid, solid, gas or electricity) consumed by one person and in a geographic area.

**Ratio Indicator:** It is "Repayment of long term debts" of total debts and the ratio of repayment of debt securities and long-term liabilities to total debt.

**Wastes Indicator:** Wastes Indicator in an industrial environment is unsustainable patterns of consumption and production which are used especially in developed countries and it can be considered as one of the main reasons for the analysis of natural resources and environmental degradation. It is seriously emphasized that land cannot sustain this level of industrial consumption in the long term. In addition, the high level of consumption has endangered the development process of countries. By a combination of government, producer and consumer efforts, it is tried to change in performance. The purpose of this change is that, contrary to the past, there is little emphasis on the consumption of substances and instead, it emphasizes the efficient use of energy and resources as well as the economic system that uses environmental and social costs.

### Methodology

Since there is little information on this subject and on the other hand, it is necessary to consider the opinion of experts about the ability of the environmental accounting system to create changes in the organization's future, the Delphi method is used as the research method. The Delphi method and a Five-option Likert Questionnaire will be used to evaluate the views in

**Table 1-** The Results of 1<sup>st</sup> Hypothesis

Hypothesis	No.	Average	Standard Deviation	T-Value	Significance Level	Difference Average from 4.5
1 <sup>st</sup> Hypothesis	70	6.41	0.85	16.31	0.000	2.01

The results of the 2<sup>nd</sup> hypothesis are described in Table2. The test statistic has T-distribution (almost normal for these data). The test statistic is equal to 5.02 The null hypothesis in

**Table 2-** The Results of 2<sup>nd</sup> Hypothesis

Hypothesis	No.	Average	Standard Deviation	T-Value	Significance Level	Difference Average from 4.5
2 <sup>nd</sup> Hypothesis	70	5.04	1.31	5.02	0.000	0.93

To test the 3<sup>rd</sup> hypothesis as Table 3, the test statistic has T-distribution (almost normal for these data). The test statistic is equal to 14.55. The null hypothesis in confidence level of 95%

one place. The views of the experts and theoretical principles of these components are obtained to evaluate the validity of the questionnaire after recognizing the components and specifications through consensus. In terms of reliability, a Likert questionnaire is designed to measure its reliability by the Cronbach's alpha coefficient. The calculated Cronbach's alpha coefficient is equal to 0.8 and since it is higher than 0.7, the reliability is accepted. Information and data are collected by 3 ways: The study of books, journals and related theses, using Internet and its information resources, the collection of research data through questionnaires.

Since this research seeks to investigate the effect of environmental accounting on operational and financial indicators, therefore, it identifies existing conditions and was done in 2014. The statistical populations of this research are professors of Ahwaz University. The sample size is calculated by Cochran Formula from unlimited population. Finally the sample size is equal to 70 respondents.

About the use of statistical methods, it should be noted that whenever the purpose is to compare the average of a variable or sample with a constant value, the t-student test can be used. In this test, the assumption of normalization is necessary (Although if the sample number is greater than 30, the distribution will be normal based on the central limit theorem).

We can compare the effectiveness of factors by Freidman test (In this section, the question is that in respondents' view which factors have a greater effect on operational and financial indicators of service companies?). if the answers are dependent on each other, they can be compared in terms of rank by using this method.

### Research Findings

Empirical evidences confirm that the procedure of sequential variables can be like distance scales, if they are different in category. So, the analysis of parametric statistics such as T-Test is justified for sequential variables.

The results of the 1<sup>st</sup> hypothesis are described in Table 1. The test statistic is equal to 16.31. The null hypothesis in confidence level of 95% is rejected. So, environmental accounting affects the service measures of service companies.

confidence level of 95% is rejected. So, environmental accounting affects the type of goods produced by service companies.

is rejected. So, environmental accounting affects the annual energy consumption.

**Table 3-** The Results of 3<sup>rd</sup> Hypothesis

Hypothesis	No.	Average	Standard Deviation	T-Value	Significance Level	Difference Average from 4.5
3 <sup>rd</sup> Hypothesis	70	7.18	1.25	14.55	0.000	2.48

About the 4<sup>th</sup> hypothesis, the results of Table 4 show that the test statistic is equal to 4.77 The null hypothesis in confidence

level of 95% is rejected. So, environmental accounting affects the ratio of long term debts to total debts of service companies.

**Table 4-** The Results of 4<sup>th</sup> Hypothesis

Hypothesis	No.	Average	Standard Deviation	T-Value	Significance Level	Difference Average from 4.5
4 <sup>th</sup> Hypothesis	70	5.29	1.38	4.77	0.000	0.75

The 5<sup>th</sup> hypothesis in Table 5 shows that the test statistic has T-distribution (almost normal for these data). The test statistic is equal to 10.85. Therefore, environmental accounting affects the

technical donations of outside the organization to service companies.

**Table 5-** The Results of 5<sup>th</sup> Hypothesis

Hypothesis	No.	Average	Standard Deviation	T-Value	Significance Level	Difference Average from 4.5
5 <sup>th</sup> Hypothesis	70	6.90	1.21	10.85	0.000	1.50

In 6<sup>th</sup> hypothesis, that the test statistic is equal to 7.08. The test statistic has T-distribution (almost normal for these data) and the Table 6 shows the results of this hypothesis. So,

environmental accounting affects the reduction of waste production by service companies.

**Table 6-** The Results of 6<sup>th</sup> Hypothesis

Hypothesis	No.	Average	Standard Deviation	T-Value	Significance Level	Difference Average from 4.5
6 <sup>th</sup> Hypothesis	70	6.03	1.76	7.08	0.000	1.53

**Ranking the Effectiveness of the Environmental Accounting System on Operational and Financial Indicators of Service Companies**

Due to the dependence of responses to compare the effectiveness of factors, the most suitable test is Freidman's parametric test.

Null hypothesis and the opposite hypothesis are formulized by as Relationship (1).

**Relationship (1)**

The average ranking of factors is the same.  
The average ranking of factors is NOT the same.

**Table 7-** Calculation of Chi-Square Statistic

Test Statistic	
No.	70
Chi-Square Value	125.02
Significance Level	0.000

**Table 8-** Comparing the Effectiveness of Test Factors

Factors	Average of Ranking	Effectiveness
3 <sup>rd</sup> Hypothesis	8.56	The Most Effect
1 <sup>st</sup> Hypothesis	7.89	
6 <sup>th</sup> Hypothesis	6.95	
5 <sup>th</sup> Hypothesis	5.54	
2 <sup>nd</sup> Hypothesis	4.35	
4 <sup>th</sup> Hypothesis	3.44	The Less Effect

According to Table 7, the null hypothesis is rejected in confidence level of 95%; because Chi-Square Statistic Values is equal to 125.02 which is in the domain of null hypothesis rejection. It means that the effectiveness of environmental accounting on operational and financial indicators of service companies is different. In Table 8, the effectiveness is ranked respectively.

The most effect of environmental accounting is on annual energy consumption, the production level of service companies, reduction of waste production and technical donations of outside the organization to service companies.

The less effect of environmental accounting is on the type of produced goods and the ratio of service debt to total debt of service companies.

## Discussion and Conclusion

The results of this study show that performance improvement requires optimal use of resources and environmental accounting affects the operational and financial indicators of service companies. The effect on annual energy consumption in addition to the positive effects on companies in the macro level, it is also worthwhile. The environmental accounting has the most effect on this factor. All other variables are affected by environmental accounting which are included respectively as the production level of service companies, reduction of waste production, technical donation of outside of the organization to the service companies, the type of produced goods and the ratio of service debt to total debt of service companies. The results of this study are the same as studies of Bennett and Mabbetts (2010), Graz (2006), Arab Salehi (2013), Oeyono et al. (2011). Arashad and Razak (2011) and Sikka (2011). Environmental accounting provides information for the decision makers in line with the process of controlling the activity and improving the business environment of the business entity. The strategy discussed in this study addresses future threats and changes which can create new and more costs for economy. The strategy discussed in this study pays attention to the future changes and threats which can create new and more costs for business. The applied operational strategy, deals with the costs that the company incurred but not aware of its extent and value. This strategy can be used to save costs and in other proposed methods in order to manage the costs.

It is expected that in future environmental costs caused by pressures of outside such as customers and government pressures will be created. Therefore, environmental accounting can effect on environmental performance improvement in order to reduce customers and government pressures and it can help companies to improve their financial and operational indicators by correct and optimal use of resources.

For future researches, it is proposed to investigate the effect of environmental accounting on reduction of total costs of service productions in the companies admitted in the Tehran Stock Exchange. Also, the effect of environmental accounting on other operational indicators of companies such as social responsibility, market share, product and customer loyalty would be investigated.

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