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## The Effect of Environmental Performance of Companies Listed on Tehran Stock Exchange on Debt Ratio

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### ABSTRACT

The environmental performance of companies plays an important role in the process of corporate development. Because environmental issues reduce environmental costs associated with pollution. Therefore, in the present study, the effect of stock market liquidity on the liquidity of banks listed in Tehran Stock Exchange was investigated. The purpose of the study is applied studies and the research method is descriptive-analytical. From all listed companies in Tehran Stock Exchange due to inclusion criteria during the years 2010 to 1977, were selected by systematic elimination method. The results show that the environmental performance of listed companies has a positive and significant effect on the debt ratio.

*Keywords: Environmental Performance, Debt Ratio, Tehran Stock*

### Introduction

In Latin, environment means all the objects surrounding us. Environmental accounting includes a set of activities that enhance the ability of accounting systems to identify, record and report the effects of environmental degradation and pollution. Environmental costs are considered as one of the acceptable costs in economic and computational processes. The purpose of environmental accounting is to provide information to evaluate their performance. Environmental accounting is



based on economic and environmental concepts, and because of not using market-based values, its application entails a change in culture (Dögl et al., 2013).

In the area of sustainable development and environmental protection and improvement, there are major issues around the world that affect economic growth and social welfare in order to alleviate poverty, along with economic growth, the pressure on natural systems and resources of the planet intensifies. The sad reality is that the economy continues to grow, but the environment on which the economy depends is not growing. Although the basic economic indices of environmental conditions are getting more negative every day, for example the forests become smaller, soils become more eroded and air temperatures rise (Pyo & Lee, 2013).

In the present era, given some environmental constraints, especially in world trade and limited competition, everyone agrees that business managers are under increasing pressure not only to reduce operating costs but also to minimize the environmental impacts of their operational activities. This pressure is exerted by groups such as shareholders, government, mass media, consumers, investors and other media. Companies have no choice but to include environmental cost information in their accounts and decisions to reduce environmental impacts of their activities (Goldstein et al., 2011).

### **Theoretical Foundations**

In recent decades, environmental issues have been addressed in various ways. The onset of a public surge in environmental issues occurred in the 1980s, with a focus on industrial pollution due to the increasing growth of industrial economies (Muhammad *et al.*, 2016).

Environmental performance represents the company's set of operations that are environmentally friendly and adaptable, and this performance is mainly measured by the criteria and scales set by the relevant institutions and agencies, both national and international (Hartmann & Vachon, 2018). In general, financially sound companies are more likely to invest in environmental activities. However, environmental activities are not directly related to increasing profitability and therefore do not lead to increase profits and returns (Bukit, Haryanto, & Ginting, 2018). Also, profitable companies with good financial performance are in fact companies that are environmentally credible and have high ranks in environmental rankings. Corporate social responsibility implies that the economic unit must be responsible for the environmental and social consequences of their business activities. In addition to the ethical reasons for companies to accept social responsibility, companies may decide to be more socially responsible for social issues due to strengthening their external image in the field of green profits in order to attract the capital of socially responsible investors (Kim, Kim, & Qian, 2018).

In the last three decades, the issue of corporate environmental reporting was raised within the framework of the social responsibility accounting system; however, since the early 21st century, the social responsibility accounting literature has shifted through environmental accounting literature (Abbasi & Mohammadi, 2012). Also, twenty years after the Rio de Janeiro Earth Summit, governments made efforts to demonstrate improved environmental performance using quantitative criteria such as pollution control and management challenges in natural resources and investment in this area increased. The Environmental Performance Index has made it easy to compare countries

and has established a method called the Global Community Performance Assessment to meet environmental policy goals. Environmental policies include environmental impact on disease, water, air pollution, water resources, biodiversity, forests, fisheries and aquatic life, agriculture, climate change. Therefore, environmental performance has many indicators. One of these indicators is the environmental performance index (Sikka, 2011).

Environmental accounting means the identification and reporting of specific environmental costs. Environmental accounting goes beyond accounting of environmental benefits and costs, which includes accounting for the costs and benefits of changes in products with corporate processes, as well as changes in environmental impacts. There is no need for environmental accounting information to be the product of accountants, but any kind of information with explicit or virtual financial content that is used as a decision making entity in the company. Product designers, financial analysts, and managers are the users of environmental accounting information (Oikonomou, Brooks, & Pavelin, 2012).

The purpose of environmental accounting is to provide information to assist managers in evaluating performance, controlling, decision-making, and reporting for an organization or region. Environmental accounting is based on environmental and economic concepts, criteria and values. Achieving this goal requires a change in culture, part of which is achieved through environmental accounting and reporting. Environmental accounting provides information that assists managers in evaluating, performing, controlling, decision-making, and reporting. Environmental accounting is based on economic and environmental concepts, and since it uses values that are not derived from the market, its use requires a change in culture (Sundin & Brown, 2017).

Environmental performance includes a set of activities that enhance the ability of accounting systems to identify, record and report the effects of environmental degradation and pollution. Environmental accounting is based on environmental integration as a source of capital and considering environmental costs as one of the acceptable costs in economic and computational processes (Nishitani, Kaneko, Fujii, & Komatsu, 2011).

Since environmental accounting also incorporates environmental reporting and environmental performance is important from the perspective of users of financial reports, disclosing environmental costs in order to protect the wealth of shareholders increases the value of the for-profit firm. Although the benefits of such costs cannot be calculated in Rials, it leads to making difference in the for-profit firm as a green industry, and despite the advantages of maintaining a competitive market among similarly non-discriminatory industries, through creating social popularity, it will have beneficial effects on the stock price of such firms in the stock market. Therefore, environmental reporting should be given a closer look by managers of economic units, especially those that incur high environmental costs (Brown, Milke, & Seville, 2011). The purpose of this study is to investigate the role of environmental performance in corporate activity.

### **Literature and Background**

In a study, Hassas Yeganeh et al (2018) investigated and analyzed environmental sustainable performance and its impact on the capital cost of listed companies in Tehran Stock Exchange. In

the first stage, after studying the theoretical foundations of the research and asking for opinions of 3 groups of experts and using confirmatory factor analysis, 20 indicators were determined. In the second stage, by examining the content of the financial statements and the reports of the board of directors of 134 companies listed in the Tehran Stock Exchange, the reporting status of these indices during the years 2012-2016 was recorded and analyzed in Excel. Finally, in the third stage, after collecting data on 79 companies, the research hypothesis was tested using panel data method with Stata 15 software. The findings show that the companies surveyed in this study had better reporting on the components of "raw materials, energy and water" than other components, but the level of sustainable environmental performance compared to external research were rated low. Also, contrary to the theoretical foundations of the research, information on sustainable environmental performance has a positive impact on corporate capital cost. In a study, Fernández-Cuesta et al (2019) showed that The carbon risk and tangibility of capital expenditures were found to be the primary drivers of the use of financial debt. The results showed that the general positive impact of carbon emissions on financial debt that was induced by the role of emissions as an indicator of activity was mitigated by firms' carbon environmental performance. Thus, a better carbon performance allowed industrial firms to obtain more long-term financial debt to finance their relevant environmental investments. Eichholtz et al., (2019) showed that loans on environmentally certified buildings command lower spreads than conventional. At the corporate level, REITs with a higher fraction of environmentally certified buildings have lower bond spreads in the secondary market. These results are robust to different estimation strategies, and signal that environmental risk is efficiently priced in the real estate debt market. In a study, Bukit et al (2018) showed that managers tend to have high firm value when company has high environmental performance and or high profitability. Sarumpaet (2005) in a study of Indonesian companies by considering environmental ratings of companies as an indicator of environmental performance found that environmental performance had no significant relationship with financial performance in Indonesian companies. In a study, Du et al (2017) examined Do Lenders Applaud Corporate Environmental Performance? Evidence from Chinese Private-Owned Firms, internal control attenuates the negative association between corporate environmental performance and the interest rate on debt, implying substitutive effects between corporate environmental performance and internal control on the reduction of interest rates on debt. The results are robust to various sensitivity tests and are still valid after controlling for the potential endogeneity between corporate environmental performance and the interest rate on debt.

### **Methodology**

This research is applied in terms of purpose and is a descriptive-correlational research in terms of data collection method. Descriptive research involves a set of methods that are intended to describe the conditions or phenomena under study. Among the descriptive researches, as in the present research, independent and dependent variables have occurred in the past, it is a post-event research. In post-event research, the researcher seeks to explore the relationships between factors and specific conditions that already existed or occurred through the study of their results. Therefore, the researcher seeks to investigate the possibility of causal relationships by observing and studying the

existing results and their previous context in the hope of finding the cause of the phenomenon or action. As a result, the researcher does not interfere with the data. In this research, data collection will be done through archival method. Thus, firstly, library method, books, authoritative journals, web resources, websites, related theses, and relevant articles will be used to formulate theoretical foundations and concepts. Next, the financial data will be collected from the end-of-year financial statements of the companies listed in the Tehran Stock Exchange using the Rahavard Novin Software, stock exchange and securities databank (Codal) and websites related to exchange. The statistical population in this study is all companies listed in Tehran Stock Exchange during the years 2010 to 2018. In this study, using systematic elimination method and considering the nature of the research and some inconsistencies among the companies listed in Tehran Stock Exchange, the following conditions are considered in order to determine the research sample:

1. For increasing the comparability, their financial period ends in March.
2. They have no change in activity or change in fiscal year during the financial years under study.
3. They are not part of banks and financial institutions (investment firms, financial intermediaries, holding and leasing companies) that have different financial disclosures and different structure of company strategic principles.

To determine whether the time series  $x_t$  has a stationary (zero accumulation order) or divergent (one accumulation order) process, we use a unit root test. As with evaluating the stationarity of variables here, we also need to apply the proper method to the panel data. F and Hausman tests are used to determine one of the two methods of fixed effect or random effect. The F-Limer test is used for selecting whether to use the panel method for estimating in the models and the panel data method must be used, if the null hypothesis of this test is rejected. The regression test is used to confirm and reject the research hypotheses and the software used is Eviews 9.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 roa_2 + \varepsilon$$

In this study, environmental performance ( $x_1$ ) is considered as an independent variable. Environmental performance of the company is assessed through Environmental Protection Agency rating (having ISO 14000 certification). Companies with ISO 14000 certification are assigned a value of 1 and otherwise zero (Zhang et al, 2014).

Debt Ratio ( $y$ ): Debt ratio indicates what proportion of a company's debt is related to its assets. This ratio is calculated by dividing total debt by total assets (Mirlohi et al., 2017).

ROA: Indicates the rate of return on assets

Therefore, the hypothesis of the present research is as follows:

The environmental performance of companies listed in Tehran Stock Exchange has a significant effect on debt ratio.

In this section, we review the descriptive statistics of the variables in the present study.

Table 1. Descriptive statistics of the research variables

Variable	Mean	Median	Std	Maximum	Minimum	Skewness	Kurtosis
Environmental performance	0.680882	1	1	0	0.466478	-0.776095	1.602323
Debt ratio	0.611292	0.646859	0.966057	0.199057	0.212672	-0.165024	1.929850
Rate of return on assets	0.660214	0.674791	0.967352	0.191500	0.196472	-0.275492	2.034916

Table 1 represents the descriptive information of the research variables. The mean environmental performance is 0.680882. This value indicates that most companies have environmental performance close to this number. The median of this variable is 1. This value indicates that half of the population has environmental performance less than this value and half of them more than this value at the company level. The maximum and minimum numbers for this variable are 0 and 1, respectively. The standard deviation number is 0.466478 which indicates the deviation of the environmental performance at the company level (with respect to the minimum and maximum values) among the statistical population. The mean debt ratio is 0.611292. This value indicates that most companies have debt ratio close to this number. The median of this variable is 0.646859. This value indicates that half of the population has debt ratio less than this value and half of them more than this value at the company level. The maximum and minimum numbers for this variable are 0.966057 and 0.199057, respectively. The standard deviation number is 0.212672 which indicates the deviation of the debt ratio at the company level. The mean rate of return on assets is 0.660214. This value indicates that most companies have rate of return on assets close to this number. The median of this variable is 0.674791. This value indicates that half of the population has rate of return on assets less than this value and half of them more than this value at the company level. The maximum and minimum numbers for this variable are 0.967352 and 0.191500, respectively. The standard deviation number is 0.196472 which indicates the deviation of the rate of return on assets at the company level.

### Investigating stationarity of the research variables

As mentioned in Chapter Three, before estimating the model, it is necessary to examine the stationarity of its variables. A variable is stationary when its mean, variance, and covariance remain constant over time. In general, if the temporal origin of a variable changes and the mean, variance, and covariance do not change, then the variable will be non-stationary.

The hypotheses about stationarity of the variables are as follows:

$$\begin{cases} H_0: \text{Variable is non-stationary.} \\ H_1: \text{Variable is stationary.} \end{cases}$$

The stationarity of the variables can be studied in three modes: "on the level", "at the first difference" and "on the second difference". Variables whose probability of testing them "at the level" is less. The results of the stationarity test are listed in Table 2.

Table 2. Evaluating the stationarity of the research variables

Variable	Levin Lin Chu statistic	Sig. level
Environmental performance	-12.9606	0.000
Debt ratio	-15.0838	0.000
Rate of return on assets	-20.5955	0.000

According to the results in Table 2, the test statistic level is less than 5%. Therefore, considering that the significance level is less than 0.05, the research variables have the required stationarity.

### Evaluating the normality of data distribution

This research uses the validated Kolmogorov-Smirnov test to evaluate the normal distribution of the main variables.

Table 3. Normality test of the variables

Variable	Type of distribution used	Sig. value	Error value	Confirmation of hypothesis	Result
Environmental performance	Normal	0.096	0.05	H0	Normal
Debt ratio	Normal	0.078	0.05	H0	Normal
Rate of return on assets	Normal	0.102	0.05	H0	Normal

According to the values obtained from the Smirnov-Kolmogorov statistic in Table 3, it can be deduced that the expected distribution is not significantly different from the observed distribution for all variables and therefore the distribution of these variables is normal.

### Testing the hypotheses

Hypothesis 1: The environmental performance of companies listed in Tehran Stock Exchange has a significant effect on debt ratio.

Since the present research data are panel data, in this type of data, the F-Limer test was used to select between panel data and combined data. The results of this test are summarized in Table 4.

Table 4. Results of the F-Limer test

F statistic	Sig. value	Degree of freedom	Test result
1.394263	0.0162	84	Panel data

Given the significance value which is less than 0.05, the panel data method is therefore accepted. The Hausman test has been used in the panel data method to select between fixed effects and random effects methods.

Table 5. Hausman test results

Statistic Test	Statistic	df	Prob
Cross-section Random	1.354292	4	0.8521

The chi-square statistic obtained from the calculations is 1.354292 and its Prob value is greater than 0.05 so the null hypothesis of using fixed methods is rejected with a probability of 95% and as a result the random effects method is accepted.

Table 6. Analysis results

Variable	Coefficient	Std	t statistic	Sig. level
Environmental performance	0.754786	0.078160	3.965690	0.0134
Rate of return on assets	0.101507	0.087026	2.166396	0.0431
Constant coefficient	0.325863	0.100806	3.232574	0.0013
Coefficient of determination	0.404979	f statistic	4.844558	
Adjusted coefficient of determination	0.400916	Sig. level	0.007169	

Durbin-Watson: 2.016313

The significance level for testing this hypothesis for environmental performance is less than 0.05

respectively, so the null hypothesis is rejected at 95% confidence level. This means that environmental performance of companies listed in Tehran Stock Exchange has a significant effect on debt ratio. Given the calculated values of  $t$  and in the last column of the values, the probability level is low. Therefore, both coefficients are significantly different from zero, in other words, they are significant. The coefficient of determination ( $R^2$ ) is 0.404979, which means that the environmental performance index has been able to explain 0.404 units of debt ratio changes in the company. The value of  $F$  statistic indicates the overall significance of 4.844558 and, in other words, the effect of the significance of the variable, which is 4.844558, which means that it is needed to show the power of the regression equation in the prediction. The Watson-Durbin statistic used to identify the independence of errors shows the value of 2.016313 which indicates that there is no autocorrelation between the error components. Therefore, there is a significant relationship between the main independent variable and the dependent variable.

One of the important assumptions about the residual term is that the distribution of its terms is normal. The Jarque-Bera test statistic was used to test the normality of the error term. According to the results, the Jarque-Bera test statistic is not significant at 5% probability level for all three models. Therefore, the null hypothesis that the error term is normal in all models is confirmed.

Table 7: Results of normality of the error term (Jarque Test)

Model	Statistic value	Probability
Hypothesis one	4.157267	0.059866

## Conclusion

The results of the research showed that the research hypothesis, the environmental performance of the companies listed in Tehran Stock Exchange has a significant effect on debt ratio, is confirmed due to having a significance level less than 0.5. In other words, the environmental performance of the companies listed in Tehran Stock Exchange has a significant effect on debt ratio. Access to maximum efficiency and performance is one of the ideal goals of companies. Today, every investor wants to invest in listed companies according to different criteria. One of these criteria is environmental performance of companies. If companies have the right performance, they can achieve the desired and ideal results. On the other hand, this performance can affect different financial ratios, one of which is debt ratio. In general, it can be said that environmental performance of companies has a great effect on debt ratio of companies, if environmental performance of a company is appropriate, it can have a positive and positive effect on the debt ratio of companies. Environmental accounting provides the necessary information (quantitative and rial) for managers to make decisions in line with the process of controlling the activity and improving the environmental performance of the business unit. The strategy to pay attention to the environmental performance of companies can create new and more costs for the enterprise. Considering that the results of the research showed that the environmental performance of companies listed in the Tehran Stock Exchange has a significant effect on the debt ratio; therefore, it can be said that the results of the study are consistent with the results from studies of Hassas Yeganeh et al., (2018), Fernández-Cuesta et al., (2019), Eichholtz et al., (2019) and Du et al (2017).

### Research limitations

The limitations of the present research are as follows:

A. The present research was conducted using the data of companies listed in Tehran Stock Exchange and other companies were excluded from the statistical population due to the specific nature of their activity, therefore, the results cannot be generalized to all companies.

B. In the economic and accounting models, the analysis of future behavior of companies is based on their past behavior. Whereas in uncertain and volatile conditions the results of the research may not be valuable or inconsistent with reality. In fact, predicting the future based on past results is reliable if we have stability and confidence.

C. Another limitation of the research is the error of data collection by the researcher which may be somewhat effective in generating wild and influential observations

### Suggestions

Investigating the effective factors on improving environmental performance in future research  
 Investigating the mediating role of company size in the effect of environmental performance on debt ratio in future research. Investigating precautionary activities to prevent environmental pollution on environmental performance

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