



Environmental Accounting: An Effort to Develop for Identifying and Ranking Green Accounting Indicators

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ABSTRACT

Those companies and industries whose activities have large-scale environmental, social, and economic effects are encountered with serious challenges in the field of information disclosure for green accounting activities. So, The aim of this research is to identify the influential variables on environmental accounting using the qualitative method of grounded theory. Moreover, it tries to investigate the effectiveness of this model using the ORESTE technique. The present research has been conducted using a mixed research method in the two qualitative and quantitative section. In the qualitative section, To collect the data required, the existing documents were studied, and 20 experts aware of the research subject were interviewed using the method of snowball sampling, and the statistical population of the research in the quantitative section is 194 managers, experts, and informed people in the field of environmental accounting. To analyze the qualitative data, open, axial, and selective coding have been used. Criteria were also prioritized using the ORESTE technique and a questionnaire. The results of the present study indicate the extraction of 6 axial codings and 91 open codings in the grounded theory qualitative method in the form of a paradigm model. Then, using paired comparisons in the ORESTE technique, after calculating the weight of the selected criteria of environmental accounting and ranking them, it was shown that the axial criteria of organizational justice, corporate social responsibility, and ethical charter had a higher degree of importance (weight). In other words, environmental accounting will be considered in manufacturing companies when organizational justice is perceived by companies and regarded by the government.

Keywords:

Environmental Accounting, Green Accounting, Grounded Theory

1. Introduction

The importance of environmental protection and accountability for it is due to the social values hidden in the environment. In other words, environmental protection and accounting have the capability to create value for society as well as for companies; therefore, today, the issue of identifying, measuring, and reporting the environment of companies is given much attention and emphasis. However, in recent years, companies have paid not that much attention or little attention to environmental issues accounting. This point would cause the activities performed by companies to emerge somehow damage the environment and cause irreparable damages to the environment and society. As this process continued, companies realized that they had to take responsibility for activities that had a detrimental effect on the environment and try to minimize these damages and move towards making industries green.

One of the issues that made companies pay attention to how to manage the surrounding environment is the use of environmental accounting in which environmental performance information items are reported and companies can evaluate their performance compared to the past and present time and have the necessary executive programs to improve their performance in the future. Among other major reasons that have attracted managers' attention towards environmental accounting, the possibility of reducing or eliminating many major environmental costs as a result of business decisions, the development of environmental performance and its major advantages for human health, and on the other hand the success of business unit as a result of better management of environmental costs, more exact costing and more accurate pricing of products and thus helping companies improve the design of the production process of products and services with more emphasis on environmental issues as a result of understanding environmental costs and the performance process of producing product can be mentioned. therefore, to increase the accountability of companies, it seems that paying attention to a comprehensive model that includes environmental accounting indicators; that is, the commitment of senior management, uncertainty and strategy, and the development of its sub-indicators is an essential issue (Latan et al., 2018).

Environmental accounting has not been much considered by companies in developing countries, and

due to the damages made by them to the environment, they have always tried not to provide the necessary reports and to consider the material benefits and profitability of the organization more, that it has caused the process of environmental damages to increase and in a way, companies have not been able to pay attention to sustainable development. Having specified the importance of environmental issues in recent years and in developing countries, many types of research have been done in this field around the world. In this regard, most of the previous researches (such as Wong et al., 2018; Latan et al., 2018; Maayer et al., 2018; Deng et al., 2018) have been correlated or have described environmental accounting and have not considered the role of environmental reporting. Also, the results of these researches are often cross-sectional and cannot be generalized to other companies due to the lack of comprehensiveness.

Like other developing countries this issue has not been properly considered in Iran; however, the use of environmental accounting can equip the organization with a tool that revises the traditional accounting system and modifies it in a way to create a communication ring between environmental managers and accountants, and by placing these two groups along each other move to improve both the company's financial performance and the environmental performance in the future; therefore, in this research, an attempt has been made to design a local and comprehensive model for identifying and ranking environmental accounting indicators using the ORESTE technique which is not studied before. The methodology of this study is based on the grounded theory approach, and this question is answered that "What are the indicators and sub-indicators affecting environmental accounting?".

In the following, at first, the theoretical foundations and empirical history of the research have been presented. Then the research methodology and findings have been described and finally, the conclusion and suggestions taken from the research have been expressed.

2. Research Theoretical Foundations

2.1. Environmental Accounting

In 1975, the Accounting Standards Compiling Board published Publication No. 5 entitled Contingency Accounting to help to identify environmental

accounting, which probable damages to the environment if its occurrence was probable and the number of losses can be estimated should be reported in the financial statements. Debts to compensate incurred damages to the environment are identified as potential losses, but due to future problems it had in estimating the ratio of these losses, various companies and industries used different procedures to estimate these losses; in such a way that no company followed the guideline properly; therefore, a need to amend and compile a new guideline was felt (Maslo et al., 2019).

In 1976, Interpretation No. 14 was published by the Accounting Standards Compiling Board entitled "Estimating the Amount of A Loss"; but no comment about the delay in registering environmental costs was made. Waste damages to resources led to an increase in public demand for the establishment of law in this case, and response to this issue, the US Congress approved the Environmental Resources Protection and Recycling Act in 1976; but this law did not do anything; thus the second federal law, entitled the Environmental Responsibility, Compensation, and Debt Society Act was approved in 1980. According to this law, 1.6 billion dollars in deposits were allocated for the cost of cleaning up places that damage the environment, that these places are analyzed and investigated by the United States Environmental Protection Agency (Moradi, 2018).

In 1990, the Accounting Standards Compiling Board published Publication No. 8.90 entitled "Investing in Environmental Pollution Costs". Of course, shareholders believe that until the environmental costs of companies are not specified and the high importance of environmental pollution control activities for managers and organizational decision-makers is not cleared, it cannot be hoped that environmental management in the industry will be taken seriously; therefore, after 1995, the ISO 14000 standard was created to encourage and persuade companies to adhere to environmental accounting policies (Mano, 2018). Concepts have the duty of presenting perspectives, practical and applied approaches in environmental accounting. In environmental accounting, there are five basic concepts of social transactions, social benefit, social pillars, social capital, and social net asset.

Environmental Accounting has been broadly defined as the preparation and publication of an account about an organization's socio-environmental

condition, employee, community, customer, and other stakeholder interactions and activities and, where possible, the consequences of those interactions and activities. Moreover, EA is an important part of sustainability reporting, the growing expectation that organizations will demonstrate their accountability to wider society through reporting and stakeholder engagement (SIGMA Project, 2003). Generally, a very important function of environmental accounting is to bring environmental costs to the managers, therefore, motivating them to identify ways to reduce and avoid economic costs related to the environment and at the same time reduces the company's environmental impact (USEPA 1998). environmental accounting which is a part of accounting and a subset of social accounting focuses on the cost structure and environmental performance of a company. Therefore, environmental accounting describes the preparation, presentation, and communication of information related to an organization's interaction with the natural environment. Moreover, environmental accounting explains the reporting of quantitative and detailed environmental data within the non-financial sections of the annual report and such reports may account for pollution emissions, resources used, or wildlife habitat damaged or re-established (Gupta, 2012). Broadly can we define that environmental accounting as the identification, compilation, estimation, justification, and analysis of environmental cost information for better decision-making within the firm for both internal and external purposes?

EA helps management to determine the sustainability of the organization in the global business. Corporations are doing business and playing the game in the corporate world by destroying the environment. By using EA, the corporate business can increase its accountability in the contaminating business world. Moreover, a company can produce EA for the following benefits;

- 1) To understand the overall environmental performance of the organization.
- 2) To identify environmental risks of the organization.
- 3) To know the environmental policy of the organization.
- 4) To measure the environmental responsibilities of the organization.
- 5) To assess annual environmental expenditure.

- 6) Calculating costs and savings of Environmental projects.
- 7) To show eco-design projects.
- 8) Design and implementation of environmental management systems.
- 9) Developing environmental performance measures, evaluation, indicators, and benchmarking for internal and external disclosure of environmental expenditure, investments and liabilities, and opportunities.
- 10) To publish sustainable reporting.
- 11) An environmental accounting system to contribute to maximizing shareholder wealth.
- 12) To disclose different preventative measures taken by the management.
- 13) Operating in a way that environmental damages do not occur.

2.1.1. Social Transactions

Social transactions are transactions and mutual exchanges between the business unit and its surrounding community that are the result of economic decisions and actions of the business unit and its surrounding community. The characteristic of this type of transaction is that they are not visible in the market of economic transactions. Identifying the social transactions reporting in the net form of its effects in the form of net profit for the financial period is an appropriate criterion for examining the social impact of a business unit (Notte et al., 2018).

2.1.2. Social Benefit

Net social benefit is the participation and impacts of a business unit's social transactions with its surrounding community during the financial period, which is obtained by comparing social costs and benefits. When calculating social benefits, the correct correspondence of social costs with social benefits must be done (Lo et al., 2013).

2-1-3-Social Pillars

Social pillars are social groups that have informally signed a social contract with the business unit and the consequence of social obligations is the responsibility of the business unit. In the conventional accounting system, these social pillars are not recognized and only the capital and equity and formal obligations of the business unit and changes during its period are recorded and reported. In the social accounting system,

these rights and social interests about the business unit can be identified and reported through the account (social capital) (Lo et al., 2013).

2-1-4-Social Capital

Social capital is the ratio of interests, rights, and claims of social pillars regarding a business unit. The registration and reporting of such rights and interests may not be consistent with the conventional accounting system; but at the same time, measuring and reporting social capital will be a useful and helpful basis for users when making the decision.

2-1-5- Social Net Asset

The social net asset is the difference between the increase of community resources and the analysis of community resources due to the activity of the business unit during the lifespan of the business unit. The social net asset is not identified and reported in the conventional accounting system as a potential source of gaining profit in the business unit operation process, while net social asset can be a useful basis for optimal decision makings of users and business unit management (Fiang et al., 2018).

2-2 Evolution Process of Theories Related to Environmental Accounting

2-2-1 Milton Friedman Theory

This theory originates from classical theories and was presented by Milton Friedman in the 1960s. According to this concept, the company has only one goal, and that is to maximize profit and, consequently, to maximize the wealth of shareholders. Of course, this goal is accepted and can be supported to the extent that it is in the form of a moral and legal framework (Friedman, 1962).

2-2-2- Barney Glaser Theory

Barney Glaser's theory has been presented in the 1970s, according to which social goals in terms of maximizing profits are considered. According to this theory, company managers should make decisions that create a balance between the rights of shareholders, employees, customers, and the general public.

2-2-3- Theory of Balance between the Interests of Owners and Society

According to the theory of balance between the interests of owners and society, maximizing profit is not the endpoint of goals; therefore, instead of trying to maximize profit, managers should look for an appropriate level of profit that profits are earned and also a proper level of social goals is fulfilled (Mobam, 2018).

In the first theory, the owner is to maximize the benefits of shareholders in a moral and legal framework.

The second theory gives a broader form to the first theory in which the owner is to maximize profits for shareholders by considering the rights of other groups such as customers, employees, and so on.

The third theory is the responsibility of companies for all stakeholders and profit is considered only as one of the results of the company's activity, and organizational decisions should be made based on those actions that create more responsibility in the community.

2.3. Theories of Disclosure of Environmental Information

There are various theories that explain the company's motivation for disclosing environmental information, including political economy theory, legitimacy theory, stakeholder theory, and organizational theory (Gray, 2006).

2.3.1. Political Economy Theory

In the political economy theory, society, politics, and economy are not separate from each other and economic issues cannot be investigated without considering social and political issues. In this theory, accounting reports are a tool to create, maintain, and legitimize the activities of institutions. In fact, financial reporting is used as a tool to transmit political, social, and economic purposes for a wide range of users; therefore, accounting reports cannot have the features of impartiality, non-advocacy and honest expression; hence, financial reporting is like a product that is exchanged between companies and their environment (Maslo et al., 2019).

2.3.2. Legitimacy Theory

Legitimacy is the resource on which the life of the organization depends, but the organization can affect this resource or manipulate it. In other words, managers in any form try to increase their legitimacy for the continuation of the organization's life. This theory states that an organization is legitimate when its value system is consistent with the accounting system and is formed as a part of society, and where there is inconsistency, the legitimacy of the organization is threatened. In the past, profit maximization was a proper criterion for an organization's legitimacy; but with societies' expectations change in recent decades, the criterion of an organization's legitimacy is that companies compensate for the damage incurred to the environment or prevent its occurrence (O'Donovan, 2002).

2-3-3 Stakeholders Theory

This theory reflects the formation of social responsibility within a corporate program framework, an effort to develop corporate strategies that are confirmed by a key stakeholders group of the organization, and also provides a potential explanation for the disclosure of environmental information in the word of the company's accountability to the intensity of stakeholders' demand, the strategic orientation of the company towards social and environmental responsibilities and the exchange between the environmental and economic society goals of the company. Stakeholders' theory is divided into ethical and managerial branches (Jamil et al., 2003).

3. Research Methodology

The present research is applied in terms of purpose; because it is in search of achieving a practical goal and is of descriptive exploratory type and survey method. In this research, at first, the relevant sources about the research topic have been collected through library resources, and after reviewing the previous related domestic and foreign researches, the statistical population appropriate to the research topic was selected and from it, the appropriate sample size has been selected. In this research, two statistical populations have been considered, each of which has been described in detail in the following.

A) The statistical population of research in the qualitative section consists of supervisor and consultant professors, some faculty members in the

field of accounting who have expertise in this field, and the elites in the field of financial management and experts who have the appropriate information in the research domain. To determine the sample size of the first statistical population, the snowball sampling method has been used. In this method, the interviews are conducted in a number that the necessary and sufficient information is provided to the researcher for designing the model; therefore, in the present research, 20 interviews were conducted, which a new concept of data did not obtain from the 16th interview. However, for ensuring that theoretical saturation was obtained, four other interviews were also conducted, and considering that no new concept and class of data were obtained from interviews, theoretical saturation was obtained. By conducting the first interview, the variables mentioned by the interviewee are identified and in the second interview, in addition to the second interviewee's comments about the researcher's question, the variables of the first interviewee are shared with the second interviewee to obtain his/her opinion in this regard. The same process continues until a consensus (theoretical saturation) according to the views of the interviewees is reached and initial corrections and changes are made based on their views. Then, many experts, including relevant university professors and many researchers were asked to study the questionnaires and interviews so that their opinions are also considered; therefore, the questionnaires used in this research have the required validity.

B) In the quantitative section, the statistical population includes all managers, experts, and informed people in the field of environmental accounting among whom the questionnaire has been distributed. Since the statistical population was not specified, at this stage the sampling method is based on stratified random sampling. This method has been used to increase the similarity of the sample and the statistical population and to increase the sampling accuracy to estimate the parameters of the population and to include the characteristics of the population in the sample. In this method, the population is divided into homogeneous groups, and each group is composed of individuals who have similar characteristics. Since the statistical population was not specified, Cochran's formula has been used to determine the minimum sample size. The figure obtained according to Cochran's formula is equal to

181, which indicates that the desired sample size is based on Cochran's formula. On this basis, the minimum statistical sample size (second) is 181 people. In this regard, the number of questionnaires for distribution was considered 240, which were distributed among the financial managers of the member companies of the Tehran Stock Exchange via e-mail and telegram groups, until finally 194 valid questionnaires were confirmed.

In this research, after reviewing the literature, firstly, using the grounded theory method, the general major and minor factors in branding have been identified. Then ORESTE technique has been used to analyze the data. To analyze the data in the qualitative section, the grounded theory method and Maxqda software have been used. In the quantitative section, ORESTE technique and SPSS software have been used.

4. Research Findings

4.1. Validity and Reliability of the Questionnaire

As stated in this research, with the support of research literature and in line with research objectives and questions, a questionnaire with two section was used; the first section of general questions including gender, education, the field of study, age and work experience, and the second section of specialized questions including questions related to the research hypotheses were used. For this purpose, the mentioned questionnaire was initially presented to 20 professors and Ph.D. students in accounting, all of whom have research experience and educational background in the doctoral program from one to four years. Based on their comments, initial corrections and changes were made. Experts, including relevant university professors and many researchers, were asked to read the questionnaire and interviews so that their opinions could be taken into account; therefore, the questionnaires used in this research have the required validity.

The method used in this research to assess the reliability of the questionnaires is Cronbach's alpha method; therefore, 25 questionnaires were distributed as an initial statistical sample and the reliability coefficient ratio of the questionnaires collected by Cronbach's alpha method has been calculated by the aid of SPSS software. The results of Cronbach's alpha

test have been reported in Table 1, and since Cronbach's alpha coefficient is more than 0.7, it shows the high reliability of the variables and distributed questionnaires.

Table 1. Results of Cronbach's alpha Test Statistics

Components	Cronbach's Test Statistics
Senior Management Commitment	0.73
Strategy	0.70
Uncertainty	0.71
Social Legitimacy	0.74
Environmental Monitoring and Control	0.79
Accounting Information System	0.76

4.2. Inferential Statistics

In the grounded theory method, after collecting interview and textual data, analysis and coding have been done in three stages of open, axial, and selective coding; therefore, in the open coding stage, by comparison, method the correlation between the homogeneity of the information and the categories

obtained according to the information achieved from the interviews has been made. Then, during the axial coding about the categories, questions are designed and about the data, the evidence and events are examined through commenting on the axial coding model by the experts, and in the selective coding stage each one of the obtained categories based on scientific documents, research history and experts' participation in data analysis and interpretation has been validated; therefore, in this research, based on the grounded theory method and after performing open, axial and selective coding stages, factors extracted from library resources, literature review and collective opinion of experts have been classified in 6 main factors of senior management commitment, strategy, uncertainty, social legitimacy, environmental monitoring and control, and accounting information system. The results of the content analysis of the interviews based on the grounded theory method have been presented in Table 2.

Table 2: Factors and Sub-Factors Identified Based on the Grounded Theory Method

Components	Sub-Components	Components	Sub-Components	Components	Sub-Components	
Senior Management Commitment	Ethical culture		Social responsibility		Moral responsibility	
	Code of Ethics		Paying attention to the interests of stakeholders		Social cooperation	
	Corporate social responsibility		Paying attention to the value of natural assets		Reducing pollution creation	
	Financial transparency		Free Aids		Amending and revising the rules	
	Organizational Justice		Reducing wastes production	Environmental Monitoring and Control	Environmental responsibility	
	Ethical regulations		Development of environmental capability		Environmental organizing	
	Respect and reverence		Environmental function		Directing Human resources	
	Belief values		Paying attention to Islamic values		Operational activities	
	Responsibility		Perceived justice		Preventing damage to the environment	
	Behavioral correction		Taxpayers' responsibility		Financial analyzing	
	delegation of authority		Self-declaration		Accounting Information System	Application of information technology
	Management commitment		Nondiscrimination			Up-to-date system
	Rule of law		Legitimacy	Improving system performance		
	Proper organizing		Commitment	Environmental Assessment		
	Permanent monitoring		Creating a sense of commitment	Software and hardware infrastructure		
	The quality of services		Responsibility	User skills		

Components	Sub-Components	Components	Sub-Components	Components	Sub-Components
	Building trust		Transparency of rules		
	Religiosity		Executive guarantees		
	Planning		Comprehensiveness		
	Realism		Handling customers' claims		
	Structure dynamics		Commitment to act the law		
	Attention to universal ethics		Investigating employees' violations		
	Using consultants		The legality of cost spending		
	Empiricism		Performing Disciplinary punishment		
	Financial justice		Stability of rules		
	Financial support		Combating against corruption		
Strategy	Sustainable Development	Uncertainty	Mastery of rules and regulations		
	Collective participation		Institutionalization of the law		
	Commitment to profitability		Eliminating excess rules		
	Economic justice		Improving the rules		
	Fair distribution of resources		Legal justice		
	Collectivism		National planning		
	Human resources		Controlling activities		
	Improving standards		Community values		
	Promoting ethical activities		Environmental culture		
	Environmental culture		Social Legitimacy		

To analyze the research data using the ORESTE technique, the major and minor factors of environmental accounting have been identified and ranked; therefore, firstly, based on the Delphi technique and entropy, the indicators have been weighted. Then, based on the ORESTE technique and cluster analysis, the leveling of the index degrees has been done.

In this section, the weighting results of each of the indicators and components of environmental accounting (decision-making matrix) have been presented in Tables 3 and 4, respectively.

The results of Table 3 show that the item of organizational justice with a normalized weight of 0.089 has the highest value. Also the results show that responsibility is the next high valued component with a normalized weight of 0.088 . Moreover Code of Ethics and Corporate social responsibility are the two next indicators with normalized weight of 0.080 and 0.079 respectively.

On the other hand software and hardware infrastructures with a normalized weight of 0.001 has the lowest value ratio. Additionally Improving system performance and Environmental Assessment are two low weighted indicators which both of them get normalized weight of 0.001. This result indicates the importance of organizational justice in determining strategies, as well as the efforts of experts and scholars towards environmental issues and challenges proposed in the field of environment.

According to the components under study, the results of Table 4 show that the senior management commitment component with the mean coefficient of 0.063 has the highest effect ratio. Also strategy and uncertainty have the next highest effect ratio with the mean coefficients of 0.041 and 0.032 respectively. On the other hand the accounting information system component with the mean coefficient of 0.001 has the lowest effect.

diameter and the worse positions are displayed on the right side of that image. The intervals of environmental accounting options have been presented in Table 5.

Table 3: Calculated Weight of Each Index Based on Delphi Technique and Entropy Weighting System (Decision Making Matrix)

Components	Entropy index	Degree of deviation	Normalized weight
Ethical culture	0.965	0.006	0.065
Code of Ethics	0.991	0.004	0.080
Corporate social responsibility	0.913	0.077	0.078
Financial transparency	0.988	0.031	0.063
Organizational Justice	0.920	0.004	0.089
Ethical regulations	0.981	0.006	0.068
Respect and reverence	0.995	0.008	0.071
Belief values	0.943	0.003	0.073
Responsibility	0.976	0.009	0.088
Behavioral correction	0.915	0.007	0.076
delegation of authority	0.953	0.005	0.060
Management commitment	0.983	0.076	0.058
Rule of law	0.986	0.082	0.049
Proper organizing	0.911	0.077	0.054
Permanent monitoring	0.943	0.071	0.056
Organizational flexibility	0.926	0.088	0.044
The quality of services	0.954	0.075	0.052
Building trust	0.961	0.066	0.042
Religiosity	0.944	0.055	0.009
Planning	0.991	0.007	0.050
Realism	0.975	0.066	0.048
Structure dynamics	0.904	0.047	0.029
Attention to universal ethics	0.965	0.073	0.031
Using consultants	0.926	0.053	0.025
Empiricism	0.954	0.063	0.076
Financial justice	0.962	0.071	0.041
Financial support	0.968	0.026	0.0021
Sustainable Development	0.977	0.05	0.030
Collective participation	0.945	0.036	0.028
Commitment to profitability	0.955	0.076	0.019
Economic justice	0.943	0.064	0.040
Fair distribution of resources	0.969	0.007	0.026
Collectivism	0.991	0.076	0.097
Improving standards	0.909	0.005	0.023
Promoting ethical activities	0.933	0.008	0.008
Environmental culture	0.966	0.009	0.007
Human resources	0.943	0.002	0.024
Social responsibility	0.993	0.004	0.018
Paying attention to the interests of stakeholders	0.955	0.006	0.008
Paying attention to the value of natural assets	0.933	0.005	0.006
Free Aids	0.944	0.076	0.004
Reducing wastes production	0.925	0.032	0.008
Development of environmental capability	0.980	0.078	0.016

Components	Entropy index	Degree of deviation	Normalized weight
Environmental function	0.981	0.101	0.009
Paying attention to Islamic values	0.955	0.088	0.112
Perceived justice	0.986	0.001	0.009
Taxpayers' responsibility	0.909	0.066	0.007
Self-declaration	0.921	0.055	0.039
Nondiscrimination	0.922	0.007	0.033
Legitimacy	0.985	0.066	0.058
Commitment	0.974	0.047	0.016
Create welfare	0.963	0.073	0.010
Creating a sense of commitment	0.964	0.290	0.012
Responsibility	0.942	0.063	0.015
Transparency of rules	0.964	0.001	0.011
Executive guarantees	0.963	0.076	0.014
Comprehensiveness	0.961	0.075	0.026
Handling customers' claims	0.982	0.166	0.011
Commitment to act the law	0.984	0.176	0.013
Investigating employees' violations	0.943	0.054	0.007
The legality of cost spending	0.984	0.073	0.007
Performing Disciplinary punishment	0.929	0.071	0.006
Stability of rules	0.906	0.004	0.005
Combating against corruption	0.922	0.106	0.017
Mastery of rules and regulations	0.901	0.248	0.007
Institutionalization of the law	0.923	0.093	0.009
Eliminating excess rules	0.948	0.042	0.010
Improving the rules	0.942	0.107	0.007
Legal justice	0.921	0.085	0.011
National planning	0.966	0.046	0.004
Controlling activities	0.976	0.092	0.002
Community values	0.911	0.077	0.002
Environmental culture	0.994	0.071	0.278
Social standards	0.933	0.088	0.023
Moral responsibility	0.956	0.075	0.009
Social cooperation	0.963	0.066	0.005
Reducing pollution creation	0.905	0.055	0.004
Amending and revising the rules	0.932	0.007	0.007
Environmental responsibility	0.943	0.066	0.004
Environmental organizing	0.960	0.037	0.005
Directing Human resources	0.933	0.043	0.005
Operational activities	0.944	0.093	0.004
Preventing damage to the environment	0.901	0.113	0.004
Financial analyzing	0.965	0.211	0.003
Application of information technology	0.943	0.106	0.003
Indigenous information technology	0.914	0.002	0.002
Up-to-date system	0.923	0.067	0.002
Improving system performance	0.914	0.005	0.001
Environmental Assessment	0.902	0.086	0.001
Software and hardware infrastructure	0.944	0.071	0.001
User skills	0.953	0.009	0.002

Table 4: Calculated Weight for Components

Components	Normalized weight
Senior Management Commitment	0.063
Strategy	0.041
Uncertainty	0.032
Social Legitimacy	0.015
Environmental Monitoring and Control	0.024
Accounting Information System	0.001

After specifying the weight of indicators, the environmental accounting indicators have been ranked based on the ORESTE technique. ORESTE technique for ranking consists of three basic stages, which are as follows.

Estimation in the ORESTE method is based on the application of a hypothetical matrix called the position matrix that in each of its columns, the decision options are arranged from the best to the worst by considering each of the indicators. By depicting the members of the resulting matrix to its original diameter, better positions are displayed on the left side of the original

A) Stage of Estimating Options Intervals $D(0, m_k)$

Table 5: Direct Linear Estimation of Interval (s) of Ten Options of Yazd Province Matrix (D)

Components	D	Components	D	Components	D
Ethical culture	0.355	Improving standards	0.376	Eliminating excess rules	0.411
Code of Ethics	0.489	Promoting ethical activities	0.198	Improving the rules	0.251
Corporate social responsibility	0.455	Environmental culture	0.298	Legal justice	0.344
Financial transparency	0.193	Human resources	0.201	National planning	0.306
Organizational Justice	0.573	Social responsibility	0.154	Controlling activities	0.511
Ethical regulations	0.454	Paying attention to the interests of stakeholders	0.205	Community values	0.311
Respect and reverence	0.387	Paying attention to the value of natural assets	0.165	Environmental culture	0.455
Belief values	0.565	Free Aids	0.436	Social standards	0.213
Responsibility	0.434	Reducing wastes production	0.411	Moral responsibility	0.488
Behavioral correction	0.288	Development of environmental capability	0.124	Social cooperation	0.311
delegation of authority	0.473	Environmental function	0.287	Reducing pollution creation	0.211
Management commitment	0.454	Paying attention to Islamic values	0.265	Amending and revising the rules	0.187
Rule of law	0.127	Perceived justice	0.409	Environmental responsibility	0.301
Proper organizing	0.351	Taxpayers' responsibility	0.103	Environmental organizing	0.201
Permanent monitoring	0.432	Self-declaration	0.343	Directing Human resources	0.121
Organizational flexibility	0.254	Nondiscrimination	0.090	Operational activities	0.198
The quality of services	0.112	Legitimacy	0.543	Preventing damage to the environment	0.411
Building trust	0.054	Commitment	0.143	Financial analyzing	0.233
Religiosity	0.342	Create welfare	0.311	Application of information technology	0.401
Planning	0.421	Creating a sense of commitment	0.232	Indigenous information technology	0.566
Realism	0.104	Responsibility	0.326	Up-to-date system	0.355
Structure dynamics	0.098	Transparency of rules	0.071	Improving system performance	0.324
Attention to universal ethics	0.276	Executive guarantees	0.298	Environmental Assessment	0.511
Using consultants	0.411	Comprehensiveness	0.511	Software and hardware infrastructure	0.488
Empiricism	0.087	Handling customers' claims	0.311	User skills	0.653
Financial justice	0.301	Commitment to act the law	0.455		
Financial support	0.076	Investigating employees' violations	0.213		
Sustainable Development	0.065	The legality of cost spending	0.433		

Components	D	Components	D	Components	D
Collective participation	0.321	Performing Disciplinary punishment	0.189		
Commitment to profitability	0.211	Stability of rules	0.322		
Economic justice	0.409	Combating against corruption	0.211		
Fair distribution of resources	0.210	Mastery of rules and regulations	0.289		
Collectivism	0.056	Institutionalization of the law	0.276		

B) Stage of General Ranking of Options Intervals Rm_k

By determining the interval of the images of each one of the members of the position matrix from the origin, the general ranking of the intervals is done. At this

stage, the intervals have been ranked by the aid of the Besson ranks mean method, and thus, the problem is returned to its sequential nature. The overall rank of the intervals of environmental accounting options has been reported in Table 6.

Table 6: General Ranking of the Intervals of the Environmental Accounting Options of Matrix (R)

Components	R	Components	R	Components	R
Ethical culture	0.125	Improving standards	0.095	Eliminating excess rules	0.084
Code of Ethics	0.185	Promoting ethical activities	0.065	Improving the rules	0.091
Corporate social responsibility	0.211	Environmental culture	0.074	Legal justice	0.085
Financial transparency	0.180	Human resources	0.087	National planning	0.094
Organizational Justice	0.213	Social responsibility	0.083	Controlling activities	0.097
Ethical regulations	0.189	Paying attention to the interests of stakeholders	0.086	Community values	0.093
Respect and reverence	0.201	Paying attention to the value of natural assets	0.076	Environmental culture	0.096
Belief values	0.205	Free Aids	0.085	Social standards	0.095
Responsibility	0.143	Reducing wastes production	0.073	Moral responsibility	0.075
Behavioral correction	0.156	Development of environmental capability	0.084	Social cooperation	0.068
delegation of authority	0.176	Environmental function	0.079	Reducing pollution creation	0.074
Management commitment	0.071	Paying attention to Islamic values	0.096	Amending and revising the rules	0.084
Rule of law	0.074	Perceived justice	0.074	Environmental responsibility	0.064
Proper organizing	0.081	Taxpayers' responsibility	0.086	Environmental organizing	0.084
Permanent monitoring	0.065	Self-declaration	0.065	Directing Human resources	0.091
Organizational flexibility	0.073	Nondiscrimination	0.086	Operational activities	0.085
The quality of services	0.93	Legitimacy	0.064	Preventing damage to the environment	0.094
Building trust	0.084	Commitment	0.055	Financial analyzing	0.097
Religiosity	0.075	Create welfare	0.083	Application of information technology	0.093
Planning	0.081	Creating a sense of commitment	0.065	Indigenous information technology	0.096
Realism	0.077	Responsibility	0.074	Up-to-date system	0.095
Structure dynamics	0.094	Transparency of rules	0.063	Improving system performance	0.075
Attention to universal ethics	0.061	Executive guarantees	0.065	Environmental Assessment	0.068
Using consultants	0.054	Comprehensiveness	0.072	Software and hardware infrastructure	0.074
Empiricism	0.071	Handling customers' claims	0.096	User skills	0.084
Financial justice	0.074	Commitment to act the law	0.074		
Financial support	0.076	Investigating employees' violations	0.086		
Sustainable Development	0.085	The legality of cost spending	0.065		
Collective participation	0.073	Performing Disciplinary punishment	0.075		
Commitment to profitability	0.084	Stability of rules	0.068		
Economic justice	0.079	Combating against corruption	0.074		
Fair distribution of resources	0.084	Mastery of rules and regulations	0.084		
Collectivism	0.083	Institutionalization of the law	0.064		

C) Stage of Aggregation

After calculating and determining all of the overall ranks, the overall ranks in each one of the indicators are summed up separately for all the options, and the option that the number related to it is larger is more appropriate and a better rank is assigned to it; meaning that the option is superior whose absolute ranks sum in all indicators is greater than the other options. The results of the ranking environmental accounting indicators have been reported in Table 7.

The results of Table 7 show that the first index of organizational justice is with the value of (0.996), the second index of corporate social responsibility is with the value of (0.840), the third index of the ethical charter is with the value of (0.740) and other indicators also according to the results of Table 8 have been ranked and finally, the human resources index is located in the last rank with the value of (0.261). This result shows that organizational justice is the most important indicator in creating an ethical charter of the organization in the field of environment.

Table 7: Results of Ranking Indicators

Components	The value of Q	Rank	Components	The value of Q	Rank	Components	The value of Q	Rank
Ethical culture	0.460	8	Improving standards	0.164	32	Eliminating excess rules	0.071	59
Code of Ethics	0.740	3	Promoting ethical activities	0.165	44	Improving the rules	0.074	60
Corporate social responsibility	0.840	2	Environmental culture	0.161	78	Legal justice	0.076	64
Financial transparency	0.320	11	Human resources	0.261	91	National planning	0.074	66
Organizational Justice	0.996	1	Social responsibility	0.311	88	Controlling activities	0.086	70
Ethical regulations	0.455	9	Paying attention to the interests of stakeholders	0.312	87	Community values	0.065	73
Respect and reverence	0.566	5	Paying attention to the value of natural assets	0.321	77	Environmental culture	0.075	78
Belief values	0.463	7	Free Aids	0.074	68	Social standards	0.068	84
Responsibility	0.594	4	Reducing wastes production	0.086	66	Moral responsibility	0.116	85
Behavioral correction	0.493	6	Development of environmental capability	0.065	54	Social cooperation	0.074	47
delegation of authority	0.378	10	Environmental function	0.075	42	Reducing pollution creation	0.086	32
Management commitment	0.298	13	Paying attention to Islamic values	0.068	74	Amending and revising the rules	0.065	74
Rule of law	0.187	21	Perceived justice	0.074	75	Environmental responsibility	0.075	64
Proper organizing	0.176	15	Taxpayers' responsibility	0.084	79	Environmental organizing	0.075	69
Permanent monitoring	0.287	17	Self-declaration	0.064	18	Directing Human resources	0.081	68
Organizational flexibility	0.276	19	Nondiscrimination	0.084	22	Operational activities	0.077	63
The quality of services	0.266	22	Legitimacy	0.091	24	Preventing damage to the environment	0.094	61
Building trust	0.082	24	Commitment	0.085	29	Financial analyzing	0.061	60
Religiosity	0.085	26	Create welfare	0.094	33	Application of information technology	0.074	48
Planning	0.074	28	Creating a sense of commitment	0.097	35	Indigenous information technology	0.086	70
Realism	0.077	27	Responsibility	0.093	36	Up-to-date system	0.065	80
Structure dynamics	0.068	30	Transparency of rules	0.096	39	Improving system performance	0.075	86
Attention to universal ethics	0.075	32	Executive guarantees	0.095	42	Environmental Assessment	0.068	89
Using consultants	0.85	36	Comprehensiveness	0.075	43	Software and hardware infrastructure	0.074	84
Empiricism	0.095	57	Handling customers' claims	0.068	45	User skills	0.084	88
Financial justice	0.097	65	Commitment to act the law	0.074	42			
Financial support	0.084	78	Investigating employees' violations	0.084	43			
Sustainable Development	0.075	33	The legality of cost spending	0.075	45			
Collective participation	0.176	30	Performing Disciplinary punishment	0.081	47			

Commitment to profitability	0.176	30	Stability of rules	0.077	48
Economic justice	0.276	19	Combating against corruption	0.094	50
Fair distribution of resources	0.189	69	Mastery of rules and regulations	0.061	56
Collectivism	0.133	55	Institutionalization of the law	0.054	58

5- Conclusion

In the present era, due to some environmental constraints, especially in global trade and the narrowing of the arena of competition, everyone agrees that the managers of business units are under increasing pressure, which not only must reduce operational costs; but they should also minimize the environmental impacts resulted from their operational activities. To reduce the environmental impacts of their operational activities, companies have no choice but to include information related to environmental costs in their accounts and decisions; but despite the huge size and importance of environmental costs, these costs have been ignored by managers; because the information provided by the traditional accounting system in this area has generally been incomplete, incomprehensible and irrelevant; therefore, the main purpose of the present research is to identify the factors affecting environmental accounting in the Tehran Stock Exchange and to provide a decision-making behavioral model and to determine the validity ratio of the model. In this research, at first, using the grounded theory technique, the components affecting environmental accounting have been identified. Then, for the intensification of data affecting and being affected and providing a valid model, the ORESTE technique has been used. To determine the statistical sample size in this research, the snowball method has been used, based on which the statistical sample size has been considered 194 people.

To achieve the objectives of the research, at first, the research literature is investigated and the desired questions for the interview have been designed. Then, using the grounded theory approach, the 6 categories of senior management commitment, uncertainty, strategy, social legitimacy, environmental monitoring and control, and accounting information system and the sub-components of each of them have been identified as factors affecting environmental accounting. In the following, according to the importance of the issue and determining the importance ratio of each of the factors, the mentioned factors have been prioritized by the ORESTE technique.

The results of prioritizing the indicators using the ORESTE technique showed that the organizational justice index with the value of (Q = 0.996) is the most important index among environmental accounting indicators. The results also showed that the company's social responsibility index with the value of (Q = 0.840), ethical charter with the value of (Q = 0.740), and responsibility with the value of (Q = 0.594) are in the next priorities, respectively. Finally, the human resource index has been located in the last rank with the value of (Q = 0.261). This finding means that environmental accounting will be considered in production companies when organizational justice is perceived by companies and also supported and considered by the government, which will make companies increase their social responsibility due to the existence of organizational justice and creates an ethical charter in the organization in the field of environment. The results of this research are consistent with the researches of Burritt and Saka (2006); Gray (2006); Faiyeh, and Wolff (2018); Oeyono et al. (2017), and Notte et al. (2018).

According to the research results, managers of the production companies are recommended to pay more attention to the issue of organizational justice, increasing participation in society and responsibility. Accountants and auditors of companies are recommended to try with more honesty in disclosing information about environmental issues and the environmental performance of companies and to encourage corporate managers to value the environmental issues as much as possible by highlighting the benefits resulted from environmental costs. Managers are also recommended that by using environmental accounting, equip the organization with a tool to revise the traditional accounting system and modify it in a way that it can process and report appropriately information related to environmental costs and provide for stakeholders and managers.

For future researches, it is suggested that the effect of environmental accounting on the ratio of cost reduction of manufactured products in companies admitted in the Tehran Stock Exchange be investigated. Also, the impact of environmental

accounting on other operational indicators of companies such as product market share and customer loyalty should be studied. For making environmental considerations applied in the form of accounting, researchers are suggested to pay attention to solutions to evaluate non-quantitative issues and address ranking the factors affecting environmental accounting by methods such as ANP, Topics, and so on, to determine the priority of each perspective of experts.

In respect of the research limitations, any research in the process of conducting is faced with limitations that the inherent limitations of the questionnaire are one of the most important limitations of the present research. Also, the lack of proper domestic researches led to the results being compared with foreign researches, that this comparison may affect the validation of the findings to some extent due to legal and cultural differences in various societies.

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