

## **INVESTIGATING THE DEVELOPMENT OF ENVIRONMENTAL DISCLOSURES BY OIL AND GAS COMPANIES OPERATING IN LIBYA: A COMPARATIVE STUDY**

**Ali Al-Drugi**

PhD candidate at the Nottingham Business School

E-mail: N0237405@ntu.ac.uk

**Hafez Abdo**

Senior Lecturer in Accounting at the Nottingham Business School

E-mail: hafez.abdo@ntu.ac.uk

### **Abstract**

This paper concerns oil and gas companies operating in Libya. It investigates the relationship between the level of environmental disclosure and company characteristics. The researchers identified a number of characteristics that associated with companies' environmental disclosure, namely, company size, company privatisation, company age and company's nationality. In the light of the empirical results it is noticed that almost all companies disclose some environmental information. In addition a significant positive association was found between level of environmental disclosure and company size, company privatisation and company's nationality. The study provides further evidence that these characteristics are important and have an impact on the level and value of environmental disclosure. On the other hand it was found that age of company is insignificant and negatively related to the level of environmental disclosure.

**Key Words:** *Disclosure, Environmental, Gas, Libya, Oil*

**JEL Classification:** Q5

### **1. Introduction**

Considering the importance and magnitude of environmental costs which are increasing year on year, a pressing need has emerged to disclose those costs due to the impact they have on the effectiveness of decisions taken by users of financial statements, especially in light of the fierce competition emanating from local and global companies. As such, investors have been made aware of that and started pressing for the urgent need to disclose environmental information in published annual reports.

Through reviewing the literature, it has been noticed that the vast majority of studies in the field of environmental accounting and disclosure have focused on developed countries such as Western Europe, America, and Australia, neglecting developing countries. According to some studies it is dangerous and wrong to apply results of these studies to developing countries (Gao, et al., 2005). Mashat (2005) examined disclosure of social responsibility in Libya; he recommended a need to study disclosure of social activities, especially environmental disclosure. Therefore, the importance of this study emerges from the belief of many authors, including the researchers, that development of quality and quantity of corporate environmental disclosure requires studying and analysing the characteristics of companies and their possible influence on the environmental disclosure practice. Also, this study comes at a time when Libya is being steered towards privatisation, with all that follows, such as the increase in the information demand from the categories using this information, in particular investors, considering that environmental information is of high importance to current and potential investors in helping them to adopt sound decisions.

## **2. Literature review**

Since 1990, there has been a growing interest in environmental disclosure as one of the most important types of social disclosure (Islam, et al., 2005).

Prior studies tried to test relationship between company characteristics and environmental disclosure; they did not provide conclusive evidence for supporting these characteristics.

There have been many studies which focus on identifying company practice when disclosing environmental information in order to identify the levels of disclosure in different countries. Such studies conclude that although many companies have significantly increased their disclosure levels, the amount and nature of information disclosed varies significantly across countries (Gray, et al., 2001). Along similar lines, some studies in different countries have been conducted in order to examine the link between environmental disclosure and some company-specific factors or characteristics, such as company size, company age, company's nationality and company privatisation. A number of these studies agree that there is a positive correlation between environmental disclosure and the size of the company; see for example (Gray, et al., 2001 and Abreu, et al., 2012), who found that environmental disclosure increases considerably in large companies. In contrast, other researchers found no positive correlation between environmental disclosure and the size of company; see for example (Akhtaruddin, 2005 and Archambault, 2003). With regard to the other determinants, there is evidence

found in some previous studies that company's nationality is a key determinant of environmental disclosures; see for example (Saida 2009). On the other hand, the results of a number of prior studies indicated that foreign companies have a negligible effect on environmental disclosure practices; see for example, (Moneva and Llena 2000). Furthermore, Jangou, (2007) revealed a noteworthy finding that in Malaysia there was more disclosure by local companies as compared to their foreign counterparts.

Moreover Wang, et al., (2004) argue that there is an inverse between privatisation and environmental disclosure; in other words, public companies are more willing to disclose environmental information than private companies. On the other hand, Uwalomwa (2011) argues that there is a difference found in environmental disclosure between private and public companies but this difference seems to be in favour of private companies. Therefore, they claim that company privatisation is an important element that has an impact on the level and value of environmental disclosure. In addition, there is evidence that old companies are more likely to disclose social information (Zubek, 2008). However, Akhtaruddin, (2005) argues that age of company does not have a significant influence on the disclosure of social information.

In addition to the above, several studies have recommended the need to focus research in the area of environmental disclosure in developing countries, particularly in Libya. Also, there is still controversy surrounding the correlation between company characteristics and environmental disclosure. The present study is motivated by the lack of research in developing countries, the Arab World and Libya in particular, regarding environmental disclosure and the controversy surrounding the company characteristics and their influence on this disclosure. In addition, this study was conducted in the oil and gas sector, which is considered as one of the most polluting of the industrial sectors to the environment as well as representing 70% of the proceeds of the industrial sector in Gross Domestic Product (GDP) in Libya. This study will attempt to answer the following questions:

- Is there any environmental disclosure practice by oil companies operating in Libya?
- Is there an association between some characteristics of companies such as company size, company privatisation, company age and company's nationality and the level of environmental disclosure?

### **3. Methodology**

To answer the research questions, annual reports were used in this study as suitable documents for collecting information about environmental disclosures from 43 national and foreign oil and gas companies operating in Libya. Content

analysis was used to provide a preliminary analysis of the quantity and nature of environmental disclosure practices in the Libyan oil and gas industry. According to Neuendorf, (2002), content analysis is considered the fastest growing technique in quantitative research and has been used widely in prior studies of social disclosure in general and environmental disclosure in particular e.g (Gray, et al., 2001 and Freedman and Stagliano, 2008).

#### **4. Data Discussion and Analysis**

In order to identify the existence of environmental disclosure and investigate the relationship between a number of company characteristics and environmental disclosure, descriptive statistics were used to identify the type of environmental information being disclosed in the annual reports of oil and gas companies. In addition, the Mann-Whitney test was used to test the difference in environmental disclosure practice between company characteristics. If a calculated Z value is between -1.96 and +1.96 then p-value will be larger than 0.05, and the null hypothesis will be accepted. If the calculated Z value is below -1.96 or above + 1.96 the p-value will be smaller than 0.05 and the null hypothesis will be rejected.

##### **4.1 Level of corporate environmental disclosure according to kind of companies (local and foreign companies)**

The mean value of environmental disclosure practice, minimum and maximum number of words of environmental disclosure for local and foreign companies operating in the oil and gas industry in Libya over the 8 year period: 2002 - 2009 is presented in Table 1. The trend in environmental disclosure in general indicates that almost 100% of companies provide environmental information, with it steadily increasing in average value throughout the period. The mean row indicates that the mean value of environmental disclosure by local companies rose from 15.67 words in 2002 to 191.7 words in 2009. The minimum number of words is rose from 7 to 158 and the maximum from 23 to 229 words from 2002 to 2009 respectively, while the mean value of environmental disclosure by foreign companies rose from 102.33 words in 2002 to 297 words in 2009, with minimum words increasing from 93 to 193 and maximum from 113 to 400 respectively. Consequently the range between the minimum and maximum of words was high and increasing for all years. Table 1 also shows that the value of the mean environmental disclosure of foreign companies is higher compared to the value of the mean environmental disclosure of local companies. It can be noted that there is a significant difference in environmental disclosure between local and foreign companies over the period, particularly between 2002 and 2004. While 13.28%, 12.47%, and 14.28% of environmental disclosure in 2002, 2003, 2004 respectively

was reported by local companies, 86.72 %, 87.53% and 85.72% was reported by foreign companies. However these differences were reduced in 2005, 2006, 2007, 2008, and 2009. While the percentages of environmental disclosure reported by foreign companies during these years were 74.37%, 62.81%, 58.98%, 61.94% and 60.77% respectively. The percentages of environmental disclosure reported by local companies during the same years were 25.63%, 37.19%, 41.02%, 38.06% and 39.23%. The reason for the reduction of the differences between local and foreign companies regarding environmental disclosure is the increase in environmental disclosure by local companies. This increase is ascribed to increase of requirements of environmental legislation in Libya, especially environmental law no, 13 of 2003, which has led to more attention to environmental disclosure. However, although in practice there is no real obligation for companies to disclose their environmental activities, local companies tend to comply with the laws.

Table 1 Descriptive statistics for environmental disclosure practice by local and foreign companies in Libya

Company	Statistics	Years								overall mean
		2002	2003	2004	2005	2006	2007	2008	2009	
Local	n	3	5	7	6	9	8	10	10	
	Mean	15.67	17	27.43	60.83	99	143.6	156.60	191.7	605.2
	%	13.28	12.47	14.28	25.63	37.19	41.02	38.06	39.23	36.6
	SD	8.08	3.862	10.8759	22.28	28.62	23.4693	32.06	25.337	172.8
	Minimum	7	14	17	24	54	112	90	158	225
	Maximum	23	23	43	92	143	176	191	229	783
Foreign	n	3	3	3	6	11	14	14	14	
	Mean	102.33	119.33	164.67	176.50	167.18	206.4	254.86	297	1048.4
	%	86.72	87.53	85.72	74.37	62.81	58.98	61.94	60.77	63.4
	SD	10.06	14.2945	14.36	27.99	59.45	53.3924	59.09	59.66	364.6
	Minimum	93	107	154	132	95	134	167	192	594
	Maximum	113	135	181	214	272	310	346	400	1500

N= number of annual reports    % = the percentage of disclosure    SD= Standard deviation

Moreover, Table 1 illustrates that the ratio of mean total environmental disclosure is not quite 37% in local companies, while it is more than 63% in foreign companies. In an attempt to explain this difference, the researchers ascribe this difference to a number of reasons; companies may resort to the disclosure of social and environmental information in an attempt to improve their reputation and erase the negative effects caused by environmental accidents, especially for companies with a reputation which may have been damaged as a result of an accident or an environmental disaster, such as the spillage of large quantities of

crude oil by Exxon company on the coast of Alaska in 1989 and BP company in the Gulf of Mexico in 2010, or Union Carbide's chemical leak in Bhopal, India in 1984. Also companies may disclose social and environmental performance in order to strengthen their competitiveness and distinctiveness. For example: many companies believe that social and environmental disclosure will give them priority in terms of new contracts for oil exploration in the future. The calculated Z value is (Z- statistic = -2.46, p-value = .014) which is below -1.96 and the p-value is less than 0.05. This means that there is a significant difference between local and foreign companies regarding environmental disclosure.

#### 4.2 Level of corporate environmental disclosure according to the size of company (small, medium and large size)

The researchers have chosen the number of employees to express the size of company, for a number of reasons. First it is very difficult to use other criteria such as value of total assets, market value of equity or capital employed because it is not feasible to obtain information on these measures from the Libyan oil companies. In contrast, information about the employees can be obtained. This indicator has been used by many studies such as; (Gray, et al., 2001 and Abreu, et al., 2012).

Table 2: Descriptive statistics of environmental disclosure by small, medium and large companies

Company	Statistics	Years								overall
		2002	2003	2004	2005	2006	2007	2008	2009	
Small	n	0	1	2	2	5	4	6	6	
	Mean	0	14	21	41.5	82	137.8	152.7	192.3	502
	%	0	14.2	13	16.6	22.1	26.8	25	26.4	21.1
	SD	0		1.4	24.7	19.6	21.4	44.4	36.7	155
	Minimum	0	14	20	24	54	112	90	158	225
	Maximum	0	14	22	59	100	164	220	261	645
Medium	n	2	1	3	1	5	7	7	7	
	Mean	20	16	30	67	113.6	165.1	203.4	241.6	721.9
	%	20.3	16.2	18.5	26.8	30.6	32.1	33.3	33.2	30.4
	SD	4.2		11.3		25.8	29.6	41.7	53.3	120.9
	Minimum	17	16	17	67	91	133	149	162	597
	Maximum	23	16	37	67	149	206	268	318	895
Large	n	4	6	5	9	10	11	11	11	
	Mean	78.5	68.8	110.8	141.6	175.2	212	254	293.6	1151.3
	%	79.7	69.6	68.5	56.6	47.3	41.1	41.7	40.4	48.5
	SD	48.4	56.1	75	57.7	56	59.2	70.5	74.2	331.6
	Minimum	7	14	17	54	92	116	150	195	686
	Maximum	113	135	181	214	272	310	346	400	1500

N= number of annual reports    % = the percentage of disclosure    SD= Standard deviation

As can be seen from Table 2, large companies disclose more environmental information than other companies (medium and small size) with the average

number of total disclosures 1151.3, 721.9 and 502 words respectively. The overall rate of environmental disclosure was nearly 50 % of large companies, compared to 30.4 % and 21.1 % of medium and small companies respectively.

Based on comparing the mean and the percentages of environmental disclosure for each year, it is clear that there is an apparent difference in environmental disclosure practice in the three groups of companies, large, medium and small, which seems to be in favour of large companies. Thus, the investigation suggests that there is an association between company size and environmental disclosure. The analysis confirms that company size is a significant factor for environmental disclosure. The calculated Z values for all sizes of company are below -1.96 and the p-values are less than 0.05, which means the difference between large, medium and small companies is a statistically significant.

**4.3 Level of corporate environmental disclosure according to company privatisation (Private and public corporations).**

The results indicate that all companies, whether public or private corporations, made some environmental disclosure in all years.

Table 3 Descriptive statistics for environmental disclosure practice by Private and public corporations

Company	Statistics	Years								overall
		2002	2003	2004	2005	2006	2007	2008	2009	
public	n	3	5	7	6	9	8	10	10	
	Mean	15.67	17	27.43	60.83	99	143.6	156.60	191.7	605.2
	%	13.28	12.47	14.28	25.63	37.19	41.02	38.06	39.23	36.6
	SD	8.08	3.862	10.8759	22.28	28.62	23.4693	32.06	25.337	172.8
	Minimum	7	14	17	24	54	112	90	158	225
	Maximum	23	23	43	92	143	176	191	229	783
private	n	3	3	3	6	11	14	14	14	
	Mean	102.33	119.33	164.67	176.50	167.18	206.4	254.86	297	1048.4
	%	86.72	87.53	85.72	74.37	62.81	58.98	61.94	60.77	63.4
	SD	10.06	14.2945	14.36	27.99	59.45	53.3924	59.09	59.66	364.6
	Minimum	93	107	154	132	95	134	167	192	594
	Maximum	113	135	181	214	272	310	346	400	1500

n= number of annual reports    % = the percentage of disclosure    SD= Standard deviation

In more details, the mean values of environmental disclosure are shown in Table 3; the mean number of words of disclosure by the public companies rose from 15.67 in 2002 to 191.7 in 2009, while the same measure for private companies rose from 102.33 words in 2002 to 297 in 2009. This increase may be due to the increase of environmental legislation in Libya, especially environmental law no, 13 of 2003, which leads to more attention to environmental disclosure.

It is clear that more attention was paid to environmental disclosure by private companies than public companies, which are likely to include more environment information in their annual reports in order to enhance their reputation and image in the market. This difference may be ascribed to pressure imposed on private companies by environmental organisations and by investors. The calculated Z value is (Z- statistic = -2.460, P-value = .014); it is below -1.96 and the p-value is less than 0.05, which means the difference between private and public companies regarding environmental disclosure is a statistically significant.

#### 4.4 Level of environmental disclosure according to age of company (Old and New company).

Table 4 indicates that there is a convergence in the rate of environmental disclosure over the period 2002-2009 between old and new companies. The maximum number of words was 374 and the minimum was 158 by old companies while the maximum and minimum number of words disclosed by new companies was 400 and 170 respectively.

Table 4 Descriptive statistics for environmental disclosure practice by Old and New companies

Company	Statistics	Years								overall
		2002	2003	2004	2005	2006	2007	2008	2009	
Old	n	6	8	10	9	14	16	18	18	
	Mean	59	55.4	68.6	131	136.9	185.9	215.4	256.7	883.1
	%	100	100	100	61.6	50.2	51.1	50.7	51.4	52.2
	SD	48.2	53.6	67.2	60.9	54.8	48.2	67.4	70	379.7
	Minimum	7	14	17	59	54	116	90	158	225
	Maximum	113	135	181	214	231	287	340	374	1500
New	n	0	0	0	3	6	6	6	6	
	Mean	0	0	0	81.7	135.7	177.3	209.3	242.5	805.7
	%	0	0	0	38.4	49.8	48.9	49.3	48.6	47.8
	SD	0	0	0	75.4	71.9	72.3	81.9	84.7	364.7
	Minimum	0	0	0	24	70	112	124	170	500
	Maximum	0	0	0	167	272	310	346	400	1495

n= number of annual reports    % = the percentage of disclosure    SD= Standard deviation

Based on this investigation, we can state that there is no difference in environmental disclosure between old and new companies. Possible explanations could be that both old and new companies want to meet the pressures of their shareholders and pressure groups as a whole.

The calculated Z value is (Z- statistic = -.600, p-value = .548), which is between -1.96 and +1.96 and p-value larger than 0.05. This means that there is no

significant difference between old and new companies regarding environmental disclosure.

## **5. Conclusion**

This study investigates the relationships between the level of environmental disclosure and company characteristics. In the light of the empirical results it can be noticed that almost 100% of companies provide some environmental information.

It is observed that there is a significant difference in the level of environmental disclosure between domestic and foreign companies and this difference seems to be in favour of foreign companies. Hence, the finding supports arguments that there is a relationship between company's nationality and environmental disclosure. In addition, the analysis above confirms that the difference in environmental disclosure between large, medium and small companies is statistically significant and this difference seems to be in favour of large companies. Moreover, there is a significant difference in environmental disclosure practice between private and public corporations, which seems to be in favour of private companies. Therefore, significant positive association was found between level of environmental disclosure and company size, company privatisation and company's nationality.

On the other hand only age of company does not have a statistically significant effect on the amount and level of environmental disclosure. Thus, the investigation did not support the hypothesis that old companies are likely to disclose more information in their annual reports than new companies.

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