

A Study of the Determinants of Corporate Environmental Disclosure in MENA Emerging Markets

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Abstract: The purpose of this study is to investigate environmental disclosure determinants in Arab Middle Eastern and North African (MENA) companies. In this regard, we investigate factors which are specific to this context. We include the 'business culture' variable inherited from former colonisers and main economic partners and the 'state ownership' and 'family ownership' variables. In addition, we consider "Country's Internet Penetration" as a new explanatory variable which is expected to influence environmental disclosure on the web site. Using a sample of 153 web sites of listed companies, findings show a negative and significant relationship between environmental disclosure and 'family ownership'. Moreover, consistent with prior work, the level of environmental disclosure is substantially affected by company size and performance.

Keywords: Environmental disclosure, determinants, Arab Middle Eastern and North African (MENA), web sites.

1. INTRODUCTION

Societal expectations of corporate performance have changed considerably over the last two decades and different stakeholder groups are putting great pressure on corporations to become more environmentally responsible. As a result, an increasing number of companies are now making environmental disclosures.

Numerous articles have investigated factors that impact the extent of firm's environmental disclosure (e.g. Coween *et al.* 1987; Patten 1991 in the United States; Huse *et al.* 1997, and Cormier & Magnan, 2004 in Europe). More recently, the literature has given growing attention to exploring environmental disclosure in Asian emerging markets over the last few years (Wong *et al.* 2001; Xiao *et al.* 2005 in Hong Kong; Haniffa and Cooke, 2005 in Malaysia; Zengal *et al.* 2010 in China). However, a few studies have focused on corporate environmental disclosure in Arab countries (Al-Bastiki 1997 in Bahrain; Abu-Baker 2000 in Jordan; Naser *et al.* 2006 in Qatar; Rizk *et al.* 2008 in Egypt). These studies are restricted to the investigation of one country and examine only annual reports as the primary corporate communication medium.

However, internet reporting is a recent but fast-growing phenomenon (Oyelere *et al.*, 2003). Many companies around the world have launched internet

reporting, which is used to communicate financial and non-financial information. A number of studies have documented well the practices of internet reporting, although most of these studies are concentrated on the financial information and investigated developed countries. Similarly, studies that have investigated the issue of environmental disclosure *via* the web are essentially descriptive and give an overview of the environmental disclosure practices on the Internet as in developed countries (Aly *et al.* 2009; Lodhia S, 2006, etc.) rather than in emerging market countries (Dutta *et al.* 2009, etc.).

The literature is relatively silent regarding corporate environmental reporting in Middle Eastern and North African (henceforth MENA) Arab emerging markets. Very few or almost no studies have focused on the determinant of environmental disclosure in MENA emerging markets. Moreover, in this context, we observe a large number of firms operating in polluting sectors, such as petrochemical, energy, food, etc. These companies have an important role in national economies but can also have significant environmental impacts.

The purpose of this paper is to address this gap in the literature by examining environmental practices and determinants of MENA polluting firms on their web sites.

In this regard, we will try to explore country-specific variables in the MENA region, such as "business culture" and "ownership concentration". It is remarkable that business culture in MENA countries is inherited from former colonisers and their main economic

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partners with the Anglo-American developed countries or with France. This variable is expected to influence corporate environmental disclosure. Indeed, as a specificity of companies in the MENA region, we note the concentration of ownership that is characterized by the presence of "Family and State Ownership". Moreover, we will integrate "Country's Internet Penetration" which is expected to influence environmental disclosure on company web sites. This variable has not been used in prior environmental disclosure studies. We believe that this variable is an important factor in the web disclosure decisions of a firm.

This study is of value in that it enlarges the scope of previous studies through its inclusion of other regions of the world. It contributes to the environmental accounting literature by bringing insights from the MENA region, where little is known about its environmental accounting features, despite the fact that, this region forms an important part of the current and future global economy. However, while previous studies test for company characteristic as company size, leverage and profitability, we add three more variables specific to the MENA region, namely business culture, family ownership and state ownership. This research, then, extends prior work on corporate environmental disclosure by expanding its scope to web-based environmental information in emerging markets where most of studies have investigated environmental reporting practices through print media. Finally, this study helps to explain Arab MENA corporate behavior in terms of environmental disclosure and has significant practical implications for a number of decision makers especially regulators in the MENA region.

In this study, we investigate the web sites of 153 companies from Arab MENA countries. The results indicate that the majority of companies in the sample had a separate section for environmental issues on their web site. However, the disclosures were found to be general statements indicating company support for environmental protection. Multivariate analysis shows that family ownership presents a significant negative association with the web sites environmental disclosure levels. However, company size and profitability are more important variables in voluntary disclosure of environmental information.

The remainder of this paper is organized as follows. Section 2 provides a brief outline of the MENA region emerging economies, Section 3 presents prior literature

and develops the hypotheses for the study. The research design is described in Section 4. In Section 5, we present the results and discussion. Section 6 concludes this paper.

2. MENAREGION PROFILE

The Arab MENA states mentioned in this study have become more and more integrated into the global economy. These countries have been moving steadily away from central economic planning to market economies and open door policies. Striving to participate in the global economy, Arab MENA countries are taking major steps in enhancing the private sector's role in the economy, developing foreign business and economic liberation. A number of Arab countries, such as Egypt and Jordan have undertaken IMF and World Bank development programs for guidance on economic liberation. Similarly, most MENA countries are now members of the World Trade Organisation (WTO) and some of them (e.g., Tunisia, Morocco and Egypt) have concluded free trade agreements with the European Union. (Ben Othman and Zeghal, 2010).

Most of the Arab countries in this study have at one time been under Western powers control. As is the case of many countries that were at one time part of the British or French Empire, these countries found that when they achieved their independence they had a professional accounting body and company legislation based on the British (or French) models (Briston, 1990). In Egypt, for example, as a result of the British colonial influence from 1882 to 1956, the training of accountants, the organisation of the accounting profession, the law regulating companies, disclosure standards and the financial reporting practices were all based on those of the UK (Samuels and Oliga, 1982). Moreover, international financial reporting standards (IFRS) are required in most MENA emerging markets. In Bahrain, Oman and Kuwait, IASs have been adopted as national standards (IASB, 2005), while, the rest of the MENA countries (Tunisia, Morocco, Saudi Arabia *et al.*) are converging to IFRS (Pacter report, 2008) as a way to attract international investors.

In addition, despite moves towards market liberalization, the state's role in the business environment of these countries is very significant (Lopez-Claros and Schwab, 2005). Indeed, as in most emerging economies, ownership in MENA emerging markets is highly concentrated. More specifically, ownership in Arab MENA companies is strongly

concentrated with a significant proportion held by the state and families (Omran, 2007).

Privatization in the MENA region has been progressing more slowly than other developing countries in Latin America and Asia. This might be due to the fact that privatization in Asia is a relatively old phenomenon compared to the MENA region where privatization on a large scale is relatively recent. Hence, the progress of privatization to date is not yet considered by investors as a credible signal of government commitment, especially in institutionally weaker environments, such as the MENA region (Ben Naceur *et al.* 2009).

Using a sample of more than 300 representative Arab firms (Oman, Egypt, Jordan and Tunisia), Omran (2008) demonstrated that Egypt remains the country with the largest presence of government ownership at 34 percent. On the other hand, Jordan and Oman emerge as the countries with the highest private ownership. These countries have more than 80 percent of firm ownership in the hands of private institutions and individuals. Tunisia comes is as the country with the largest foreign participation in firm ownership at 18 percent – surely facilitated by the free trade agreement with the EU – and also appears to be the one with the least participation by local individuals.

Indeed, Al-Moatez and Lakhel (2008), investigate a sample of 48 Saudi companies including manufacturing firms with a percentage of 47.9percent, followed by the service industry with 25percent. Descriptive statistics show that the Saudi firms are mostly held by families (the mean percentage of family ownership in Saudi Arabia is 22.2 percent) and the government (state ownership is present on average at about 10 percent).

3. BACKGROUND AND DEVELOPMENT OF HYPOTHESES

Corporate environmental reporting has been mainly a phenomenon of developed countries and, consequently, most corporate environmental reporting studies have been confined to developed countries.

A handful of studies have concentrated on the newly industrialized countries, such as Hong Kong, China, Korea and Malaysia. In addition, a majority of corporate environmental reporting has primarily focused on conventional print media, especially annual reports, as a disclosure medium (Lodhia, 2005). However, web-based environmental communication

studies are a relatively new addition to the environmental communication literature.

3.1. Prior Research

The “earlier” literature on web based environmental communication (such as Craven and Otsmani 1999; Williams and Pei 2000 as cited by Lodhia (2006) indicated that larger companies and those operating in developed countries are more likely to use the web for environmental communication. More recent literature has focused specifically on larger companies operating in the developed world. These studies include: Patten (2002); Allam and Lymer (2002); Cormier and Magnan (2003) and Andrew (2003). The common finding in these studies is that companies are not extensively utilising the web for environmental communication.

Allam and Lymer (2002) examined the type of information available on the internet for 50 companies from five countries, namely, the USA, UK, Canada, Australia and Hong Kong. Findings indicate that only 36 percent of the US companies’ web sites had environmental information.

KPMG’s (2002) survey, found that environmental reporting still continues to be the highest in countries, such as the USA, Japan, Germany and UK and in industries, such as chemicals, pharmaceuticals and automotive.

Adams and Frost (2004) did a comprehensive study of web-based environmental communication in Australia, the United Kingdom (UK) and Germany. They analyzed websites, sent surveys to corporate managers and also held interviews at specific companies. Their findings suggested that there was limited use of websites for environmental communication. The authors also reveal that the main purpose of developing corporate web sites was to raise corporate awareness and to improve corporate image rather than to report ethical and environmental issues and use web based technologies to engage stakeholders.

Lodhia (2006) examined the web-based environmental communication practices of companies in an environmentally sensitive industry, the Australian Minerals Industry. The companies’ websites (fourteen companies) were analysed over two different time periods, July and November, 2003. The findings of this research indicated that the potential of the web was not extensively utilised by companies for environmental communication.

In emerging markets, Dutta and Bose (2008) investigated the utilization of corporate websites for communicating corporate environmental information by the listed companies of Bangladesh. For that purpose, corporate websites of 104 companies for the period of three months (August 1, 2007 to November 3, 2007) were analyzed. This study shows that web-based corporate environmental reporting in Bangladesh is still in its infancy, as the level of environmental disclosures on corporate websites is very low.

Al-Arussi *et al.* (2009) examined whether the voluntary environmental disclosures through the internet can be explained by the same determinants as in conventional reporting. Six hypotheses were tested using data collected from 201 Malaysian listed companies for the financial year 2005. The results indicate that the level of technology, ethnicity of CEO and firm size are determinants of internet environmental disclosures.

Focusing on the MENA region. Aly *et al.* (2009) analysed the potential factors that may affect the level of corporate internet reporting by Egyptian listed companies. This study highlighted that 56 percent of Egyptian companies report a significant portion of information on their web sites. In addition, the results indicate that profitability, foreign listing and industry type are the determinants of the amount and presentation formatting of information disclosed on Egyptian companies' web sites.

In Jordan, Al-Haybat (2011) seeks to explain corporate online reporting by using companies' characteristics as explanatory factors for any variations in disclosure. The finding showed that variations in corporate online reporting were associated with size, performance, foreign ownership and online company familiarity.

Most of the prior research on web-based environmental communication is descriptive, merely focusing on information content on websites and comparing this between developed countries. Few studies are investigating the web's environmental disclosure in developing countries. Mostly, these studies were conducted in the context of newly industrialized Asian countries such as Malaysia and Singapore. The current research surveys the environmental disclosure practices and determinants via the web sites of companies operating in the Arab MENA region in an attempt to fill a gap in the current literature.

3.2. Development of Hypotheses

Based on prior research, the studies which investigated the factors that may influence the amount of corporate environmental disclosed on web sites have analyzed the same variables as the annual reports. Consequently, in this study we will use the same factors that may explain the corporate environmental disclosure on the web sites. At the same time, previous research shows many determinants of environmental disclosure, such as firm size, debt, profitability, etc. However, the influence of these variables was different between countries. In this regard, and in order to understand the environmental practices and determinants for companies of the Arab MENA region, we will try to investigate factors which are specific to this context. The environmental disclosure behavior within MENA emerging markets has been inherited from former colonisers with whom they still maintain significant economic and business relations. Consequently, we include a new variable: the "business culture" inherited from former colonisers and main economic partners. Indeed, unlike developed countries where ownership is widely spread among different shareholders, ownership is highly concentrated in the MENA region. Therefore, we will test the impact of "state ownership" and "family ownership" on environmental disclosure. Then, we will add a new explanatory variables "Country's Internet Penetration" which is expected to influence environmental disclosure on the web site.

3.2.1. Business Culture

MENA countries have been market by either a strong tie with the UK and the USA or with France. Gulf States and Jordan maintain privileged economic relations with developed Anglo-American countries specifically with the USA and the UK. However, former French colonies in the MENA region (e.g.; Morocco and Tunisia) have privileged economic relations with developed continental European countries, specifically with France. Therefore, a business culture inherited from former colonisers and main economic partners should be an important determinant of the level of environmental corporate disclosure in the MENA region. In this regard, Saudagaran and Biddle (1992) reported that the disclosure requirement and expectations in Anglo-American developed countries are higher than in continental European countries. Indeed, Ben Othman and Zeghal (2010) examined transparency and disclosure determinants for MENA companies. Using a sample of 216 annual reports, the

results show that MENA companies from countries having historical links with Britain have substantially higher transparency and disclosure scores than MENA companies in former French colonies. With this in mind, we present the following hypotheses.

H1: MENA companies in former British colonies or with strong economic ties with the Anglo-American countries are expected to communicate higher levels of environmental disclosure *via* web sites than MENA companies from former French colonies.

3.2.2. Ownership Structure

Despite the growing position of capital markets in the MENA emerging economies and the adoption of privatization programs, ownership is highly concentrated with a significant proportion held by the state and families (Omran, 2007). The descriptive statistics show that in the food and pharmaceutical sectors “family ownership” is dominant whereas “state ownership” is dominant in all other sectors.

Family-owned companies prevail on the MENA capital markets and the predominance of family members or close relatives suggests an important role in the executive position within the company (Miteva, 2007). These stakeholders can use their power by requesting information directly from company management. In this case, the possibility of forcing management to voluntarily disclose environmental information on their web sites is remote. Therefore, we propose:

H2: There is a negative association between family ownership and environmental disclosure.

Furthermore, government ownership is a main feature in the MENA region. The government is expected to show that it acts for the benefit of society. A company with high government ownership is expected to observe environmental protection principals in order to be seen as a good example for other companies totally owned by the private sector.

Naser *et al.* (2006) reported a positive but insignificant association between the extent of environmental disclosure and government ownership in Qatar.

Accordingly, we hypothesize:

H3: Firms with government ownership are more likely to disclose environmental information.

3.2.3. Internet Penetration

Debrency *et al.* (2002) demonstrated a positive relationship between the level of Internet use in the country and the extent of information disclosure by companies *via* their websites. Similarly, firms will likely have higher environmental disclosure if they believe that there is a large Internet audience amongst their domestic stakeholders.

The use of the Internet varies widely between MENA countries, the highest level of Internet penetration is 81.6 percent in Qatar. Egypt shows the lowest level (26.7 percent) (ICT, indicators database, 2010).

In countries where there is heavy penetration of Internet usage, it is expected that many companies will adopt voluntary disclosure of environmental information *via* the internet. Therefore, it can be hypothesised that:

H4: The level of Internet environmental disclosure is positively associated with the country's internet penetration.

3.2.4. Control Variables

In the following, we discuss hypotheses related to control variables.

3.2.4.1. Firm Size

Prior studies (e.g. Cormier and Magnan, 2003) found a positive relationship between company size and the level of environmental disclosure in a number of countries.

As such, larger companies are inclined to report more frequent and more accurate environmental information to ensure a positive social image in the information disseminated to the public and delivered to investors. Accordingly, we expect that larger firms are more likely to disclose environmental information through their web sites than smaller firms.

3.2.4.2. Leverage

Companies' investors and lenders rely on financial statements for the evaluation of a firm's financial standing and credit rating. Therefore, managers are inclined to increase disclosure to reduce agency costs between insiders and creditors.

Empirical literature provides mixed results. Cormier and Magnan (2002) and Brammer and Pavelin (2006) demonstrated a negative relationship between environmental disclosure and leverage. However,

Roberts (1992) and Naser *et al.* (2006) reported a positive association.

This study investigates companies which operate in polluting sectors. These firms are more likely to be punished. With this in mind, the bankers and lenders will pay more attention to these companies' communication about corporate environmental responsibility. Consequently, the polluting companies will prefer to report more environmental information if they have more debt. Therefore, we propose that firms with higher debt are more likely to disclose environmental information.

3.2.4.3. Profitability

Based on signaling theory and agency theory, it can be argued that because of the separation between the manager and the owners of companies and the difficulties that investors face in directly observing the extent and the quality of managers' efforts on their behalf, investors will depend on reports of managers' performance to monitor their investments. Managers of companies with better performance than others wish to distinguish their performance through a process of voluntary disclosures such as corporate environmental information.

While Cormier and Magnan (2004) documented a weak association between corporate social disclosure and profitability, Zheng *et al.* (2009) found a positive relationship for Chinese companies. In this study, we expect a positive association between profitability and the extent of environmental disclosure.

4. METHODOLOGY

4.1. Data and Sample Selection

We collected listed companies from the Arab MENA region that operate in polluting sectors. These companies were selected because they are more sensitive towards environmental issues and they normally invest much more in environment protection than those from other industries (Salomone *et al.* 2001; Moneva *et al.* 2000; Gamble *et al.* 1995; Barth *et al.* 1994). KPMG (2002) found that sectors showing the most activity in environmental reporting were those in high risk areas such as chemicals, pharmaceuticals and automotive. Based on prior research. The polluting sectors selected in this study are: pharmaceutical (Adams *et al.* 2000), energy (Tilt, 2001; Anderson *et al.* 1998; Barth *et al.* 1994), chemical (Adams *et al.* 2000; Anderson *et al.* 1998; Barth *et al.* 1994), mining

(Anderson *et al.* 1998), transportation (Bartoloméo, 2000; Barth *et al.* 1994), and food (Barth *et al.* 1994).

The sample construction starts with collecting lists of companies operating in polluting sectors from web sites of financial markets in the MENA region as well as from the web site www.gulfbase.com which specializes in financial and stock market information of companies in GCC countries. We downloaded the web sites of these companies in December 2010. For that, we used the software "HTTrack web site" which allows the aspiration of the entire contents of the websites. From this sample, we removed companies which do not have web sites or those having inaccessible web sites. This left us with a sample of 153 companies. Distribution of the sample between different sectors is shown in Table 1.

Table 1: Distribution of Sample Companies

Sectors	Number of companies	Percentage
Mining	45	29.41%
Food	39	25.49%
Chemical	36	23.52%
Energy	12	7.8%
Transportation	11	7.1%
Pharmaceutical	10	6.68%
Total	153	100%

4.2. Empirical Model

In this study, we attempt to explain environmental disclosure (score) factors through web sites for Arab MENA companies. In the first model, we tested determinants of environmental communication *via* web sites. This model integrates "Business Culture", "Family and State Ownership" as specific variables of the MENA region and "Internet Penetration" in order to investigate factors that influence environmental disclosure *via* web sites. We added in Model 2 MENA country dummies as control variables.

Model 1:

$$SCORE = \alpha_0 + \alpha_1 BUS-CUL_i + \alpha_2 FAM-OWN_i + \alpha_3 GOV-OWN_i + \alpha_4 INT-PEN_i + \alpha_5 SIZE_i + \alpha_6 LEV_i + \alpha_7 PROF_i + e_i \tag{1}$$

Model 2

$$SCORE = \alpha_0 + \alpha_1 BUS-CUL_i + \alpha_2 FAM-OWN_i + \alpha_3 GOV-OWN_i + \alpha_4 INT-PEN_i + \alpha_5 SIZE_i + \alpha_6 LEV_i + \alpha_7 PROF_i + COUNTRY DUMMIES + e_i \tag{2}$$

Where

SCORE:: the environmental disclosure rating of firm i .

BUS-CUL: is a dummy variable. It takes a value of one if the firm i is located in a country which has strong economic ties with United Kingdom or United States, zero if the firm i is located in a French business culture MENA country.

FAM-OWN: family ownership of firm i , measured by the percentage of capital held by family (year ended 2010).

GOV-OWN: government ownership of firm i , measured by the percentage of capital held by the state (year ended 2010).

INT-PEN: Internet Penetration of firm i .

SIZE: size of firm i , measured by the "log total assets" (year ended 2010).

LEV _{i} : leverage of firm i , measured by "debt to assets ratio" (year ended 2010).

PROF profitability of firm i . we use the ROA as a measure of the profitability (year ended 2010).

4.3. Environmental Disclosure Measurement: SCORE

In order to measure a firm's environmental disclosure, we based it on the Environmental Indicators developed within the frame work of the Global Reporting Initiative (GRI) (the last version entitled "G3.1" and published in March 23, 2011). The GRI provides guidelines to firms in reporting on economic, environmental and social aspects of their activities, products and services and is the internationally accepted standard for TBL reporting (Colman, 2004 and 2005; Hopkins, 2004).

Through comparison of the items in the GRI as well as from the investigation of web sites of the sample, a list was developed, which is more closer to the context of study (see Appendix A).

The approach to scoring items is dichotomous in that an item scores one if disclosed and zero if it is not. Data for all 33 items that make up the environmental disclosure score were directly and manually extracted from the web sites for the year ended 2010.

The scores for each item are added and equally weighted to derive a final score for each company.

The score for each company j is calculated as follows:

$$\text{SCORE} = \frac{\sum_{i=1}^N X_{ij}}{N}$$

Where N is the total number of items expected to be disclosed for firm i .

X_{ij} is equal to 1 if item j is disclosed for firm i , and 0 if not disclosed.

4.4. Measurement of Independent Variables

***BUS-CUL _{i}** : Business culture is a dummy variable that distinguishes Arab MENA countries influenced by British business culture from those influenced by French business culture. It takes a value of one if the firm i is located in a country which has strong economic ties with the United Kingdom or United States, zero if the firm i is located in a French business culture MENA country.

***FAM-OWN _{i} and GOV-OWN _{i}** : family ownership and government ownership of firm i , to measure these variables, we use:

- Percentage of capital held by family (year ended 2010) for family ownership.
- Percentage of capital held by the state (year ended 2010) for government ownership.

***SIZE _{i}** : size of firm i . Prior studies shown that there is a positive relationship between size and environmental disclosure (Patten, 1992; Cormier and Magnan 1999; Neu & *et al.* 1998; Leuz and Verrecchia, 2000; etc). This variable was derived through several proxy measures (the turnover, the number of employees, total assets, etc). In this research, the size will be measured by the "log total assets" (year ended 2010).

***LEV _{i}** : leverage of firm i . in this study the measure used to present leverage is "debt to assets ratio" (year ended 2010).

***PROF _{i}** : profitability of firm i . several ratios were used to assess the influence of profitability on environmental disclosure. In this investigation, we use the ROA as a measure of the profitability (year ended 2010).

***INT-PEN _{i}** : Internet Penetration of firm i . The rate of Internet penetration for each country in this study will

Table 2: Distribution of Environmental Score for MENA Emerging Markets

Country	N	Mean	St. dev	Min	Max
Bahrain	3	.0606	.1049	0	.182
Egypt	16	.1270	.1470	0	.484
UAE	22	.1240	.1305	0	.394
Jordan	14	.1126	.1622	0	.575
Kuwait	14	.0367	.0906	0	.303
Morocco	10	.1031	.1262	0	.364
Oman	18	.0474	.0634	0	.212
Qatar	7	.0779	.1062	0	.272
SaudiArabia	41	.0977	.1163	0	.364
Tunisia	8	.0912	.0961	0	.364

be collected from statistics compiled by the ITU (International Telecommunication World/ICT indicators database).

5. RESULTS AND DISCUSSION

5.1. Descriptive Statistics and Univariate Analysis

As shown in Table 2, we note that environmental scores are quite low. The mean environmental score is between (0.1240) for companies in the UAE and (0.0367) for companies in Kuwait. The investigation of the sample shows that the majority of companies in this study had a separate section for environmental issues on their website. However, the disclosures were found to be general statements indicating company support for environmental protection and describing projects undertaken to reduce pollution and save energy and resources. These findings are in line with results obtained in previous studies (Allam and Lymer, 2002; Adams and Frost, 2004; Lodhia, 2006) and suggested that there was limited use of websites for environmental communication.

Table 3 provides the univariate difference of the environmental scores between companies pertaining to Anglo-Saxon and French business cultures. The t-test and Wilcoxon Mann Withney for equal variances (we

have a small sample size, so we cannot assume normality) indicate that the environmental score does not differ much by inherited business culture (p -value>0.05).

In the developing of hypotheses, we expected that the correlation between the level of environmental disclosure of a company in the MENA region and family ownership would be negative. This correlation is positive with the presence of government ownership and "Country's Internet Penetration" as a new explanatory variable. However, the findings show that all the correlation coefficients in Table 4 are not significant.

5.2. Multivariate Analysis

Table 5 presents regression results of the environmental score on test and control variables based on the sample of MENA companies.

The variance inflation factors (VIF) were calculated to assess the extent of any multicollinearity problem. All VIF factors are less than 5 (mean=1.12) indicating that there is no serious problem of collinearity. The Breusch-Pagan test statistic indicates the existence of heteroscedasticity in the models. However, we treated this problem of heteroscedasticity with the test of White *via* Stata software. The Fisher statistic is significant at a

Table 3: Univariate Analysis Difference of Environmental Scores Between Companies Pertaining to Anglo-American and French Business Cultures

Dependant variable	Business culture	N	Mean	Std. Dev.	t-statistic (p-value)	z-statistic (p-value)
SCORE	French	18	.0923	.1113	0.2436	0.129
	Anglo-American	135	.0921	.1210	(0.8078)	(0.8976)

Notes: SCORE: the environmental disclosure rating of firm *i*. Business culture. It takes a value of one if the firm *i* is located in a country which has strong economic ties with the United Kingdom or United States, zero if the firm *i* is located in a French business culture MENA country (Tunisia and Morocco).

Table 4: Correlation Results Between Environmental Scores and Family Ownership, Government Ownership and Internet Penetration

	N	FAM-OWN	GOV-OWN	INT-PEN
SCORE	153	-0.1065 (0.190)	0.0908 (0.264)	-0.005 (0.946)

Notes: SCORE: the environmental disclosure rating of firm i. FAM-OWN: family ownership of firm I, measured by the percentage of capital held by family (year ended 2010). GOV-OWN: government ownership of firm i, measured by the percentage of capital held by the State (year ended 2010). INT-PEN: Internet Penetration of firm i.

Table 5: Regression of Environmental Score on Test and Control Variables Based on the Sample of MENA Companies

Independent variables	Dependent variable: SCORE	
	Panel A: Model 1	Panel B: Model 2
	Coefficient estimate (p-value)	coefficient estimate (p-value)
INTERCEPT	-1.24 (0.217)	-1.20 (0.233)
BUS-CUL	-0.85 (0.397)	-0.80 (0.423)
FAM-OWN	-1.15 (0.254)	-1.77 (0.079)*
GOV-OWN	0.18 (0.854)	0.20 (0.845)
INT-PEN	0.39 (0.697)	-0.59 (0.555)
SIZE	2.69 (0.008)***	2.49 (0.014)**
LEV	-1.68 (0.096)*	-1.50 (0.137)
PROF	1.98 (0.050)**	1.54 (0.126)
UAE	-	1.86 (0.065)*
Qatar	-	1.86 (0.384)
kuwait	-	-1.32 (0.188)
Bahrain	-	0.90 (0.370)
Oman	-	0.62 (0.538)
Tunisia	-	-0.73 (0.468)
Egypt	-	1.10 (0.272)

(Table 5). Continued.

Independent variables	Dependent variable: SCORE	
	Panel A: Model 1	Panel B: Model 2
	Coefficient estimate (p-value)	coefficient estimate (p-value)
Morocco	-	0.42 (0.678)
Jordan	-	1.06 (0.293)
F statistic	1.94	1.65
Prob>F	(0.0479) **	(0.0585) *
R square	0.14	0.17

Notes:

Model 1

SCORE= $\alpha_0 + \alpha_1 \text{BUS-CUL}_i + \alpha_2 \text{FAM-OWN}_i + \alpha_3 \text{GOV-OWN}_i + \alpha_4 \text{INT-PEN}_i + \alpha_5 \text{SIZE}_i + \alpha_6 \text{LEV}_i + \alpha_7 \text{PROF}_i + e_i$

Model 2

SCORE= $\alpha_0 + \alpha_1 \text{BUS-CUL}_i + \alpha_2 \text{FAM-OWN}_i + \alpha_3 \text{GOV-OWN}_i + \alpha_4 \text{INT-PEN}_i + \alpha_5 \text{SIZE}_i + \alpha_6 \text{LEV}_i + \alpha_7 \text{PROF}_i + \text{COUNTRY DUMMIES} + e_i$

SCORE: the environmental disclosure rating of firm i ; BUS-CUL: Business culture. It takes a value of one if the firm i is located in a country which has strong economic ties with the United Kingdom or United States, zero if the firm i is located in a French business culture MENA country (Tunisia and Morocco); FAM-OWN: family ownership of firm i , measured by the percentage of capital held by family (year ended 2010); GOV-OWN: government ownership of firm i , measured by the percentage of capital held by the state (year ended 2010); INT-PEN: Internet Penetration of firm i ; SIZE: firm size = log total assets; LEV: leverage = debt to assets ratio; PROF: profitability = ROA.

In Model 2, Saudi Arabia was considered as a country reference due to the large number of Saudi companies.

*** ** * indicate two-tailed statistical significance at 1%, 5% and 10% levels.

level of 5percent (F-statistic of 1.94) in model 1 and at 10percent in the second model (F-statistic of 1.65).

Table 5 indicates that no significant relation between the business culture variable and the extent of environmental disclosure exists. This finding is different from results obtained by Ben Othman and Zeghal (2010) and which indicate a positive and significant influence of the business culture milieu on the transparency and disclosure levels for MENA emerging market companies.

Concerning the ownership structure, Table 5 presents results which are consistent with our hypotheses in Model 2. This variable is significant at a level of 10 percent when we added in the second model "MENA country dummies" as control variables (t-statistic of -1.77). While the relationship between environmental disclosure and government ownership is not significant in the two models. Similarly, internet penetration seems to have no effect on environmental disclosure.

Moreover, consistent with prior research, findings support the empirical evidence that size and profitability are important variables in voluntary disclosure of information related to social and environmental activities (Patten, 2002; Allam and Lymer, 2002; Cormier and Magnan, 2003 and Andrew, 2003). The coefficients obtained for the size and performance variables are positive and statistically significant at a

level of 1percent for size (t-statistic of 2.69) and at a level of 5percent for performance (t-statistic of -1.68) in Model 1. Size variables have less of an influence on the level of environmental disclosure when we added them into Model 2 MENA country dummies as control variables. In addition, we find a negative and significant relationship between environmental disclosure and leverage in Model 1 at a level of 10 percent. However, this variable has no more significance when we added it into Model 2 of the MENA country dummy variables.

Results report that the influence of the majority of variables is not statistically significant, as shown by their coefficients. These findings may be due to several factors. First, There are no standards and regulations that determine the content of environmental disclosure and require companies to communicate environmental information. Also, the MENA region consists of emerging markets and therefore the demand for environmental information by investors is relatively low. Besides, the vast majority of MENA listed companies have concentrated ownership mainly through family ownership which reduces the level of environmental disclosure for outsiders.

6. CONCLUSION

The purpose of this paper is to investigate the determinants of environmental disclosures *via* the web sites of Arab MENA companies. In this regard, we included the "business culture" variable inherited from

former colonisers and main economics partners. Moreover, unlike developed countries where ownership is widely spread among different shareholders, ownership is highly concentrated in the MENA region. Therefore, we tested the impact of “state ownership” and “family ownership” on environmental disclosure. Furthermore, we added “Country’s Internet Penetration” as a new explanatory variable which was expected to influence environmental disclosure on the web site.

We collected 153 web sites of listed companies. We downloaded the web sites of these companies in December 2010. The analysis of the sample shows that the majority of companies in this study provide a separate section for environmental issues on their website. However, disclosure is found to be made up of general statements indicating company support for environmental protection and the environmental scores are quite low. These results can be explained by the fact that the majority of MENA listed companies have concentrated ownership mainly through family ownership which leads to a significant negative association with the web sites’ environmental information disclosure levels.

Among all the investigating variables, company size has the most significant impact. It is shown in this study that the larger the company is, the more they take environment problems into account, and the better the environmental information disclosed. A company’s profitability also has a great impact on disclosure. One possible explanation is that polluting companies willingly unveil some environmental accounting information to show that they have corporate environmental responsibility. These results are in line with those of previous studies on environmental communication disclosure mentioned above.

The dominance and influence of accounting systems inherited from former colonisers, on accounting practices in the Arab MENA region has created a very narrow view of the role of accounting as primarily an obligation to report financial information. Managers do not pay much attention to the information needs of other users, such as the government, workers or society at large.

There are some limitations inherent to the exploratory nature of this study. First, more consistency would be provided by analysing information on web sites at different period rather than being analysed at one particular time (Lodhia, 2006) and results would be

more conclusive if more companies had been included in the sample. Second, in regard to internal validity, the list of items on environmental activities to compute the environmental disclosure index might not be exhaustive. Furthermore, the sample in this study was taken from the polluting sectors. Consequently, the results may have limited external validity beyond the industry settings of the study. Despite these limitations, this research contribute to the understanding of environmental disclosure *via* web sites in MENA emerging markets. As the growth in the internet continues, we expect more companies will be creating web sites within the next few years.

In relation to practice, this study highlights the use of the web for environmental communication and suggests that companies are not fully utilising this potential for environmental communication. It is suggested that policy makers such as regulators and environmental associations could play a key role in providing an impetus to companies to move beyond merely using websites for organizing environmental information and to utilise the “full” communication potential of the web.

Furthermore, the Web has emerged and speedily spread over the years, and while it has extensive usage for e-commerce activities, corporate communication is another area where it could be successfully utilized. Continuous communication, use of presentation features (such as audio and video clips, webcasts, and even video conferencing), greater interactivity and personalization are envisaged for web-based environmental communication in the future. Increased academic research in this area and development of methods that could capture the dynamic nature of change of information on websites would also be beneficial.

APPENDIX A. ENVIRONMENTAL DISCLOSURE ITEMS LIST

List of Items

Aspect: Materials

- Consumption of raw materials
- Recycling

Aspect: Energy

- Direct energy consumption by primary energy source.
- Indirect energy consumption by primary source.

- Energy saved due to conservation and efficiency improvements.
- Initiatives to provide energy-efficient or renewable energy-based products and service
- Initiatives to reduce energy consumption

Aspect: Water

- Consumption of water (total water consumption)
- Water sources significantly affected by withdrawal of water.
- Total volume of water recycled and reused

Aspect: Biodiversity

- Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity
- Description of significant impacts of activities, products, and services on biodiversity
- Habitats protected or restored.
- Strategies, current actions, and future plans for managing impacts on biodiversity and environment.
- Number of IUCN Red List species in areas affected by operations,

Aspect: Emissions, Effluents, and Waste

- Total direct and indirect greenhouse gas emissions
- Other relevant indirect greenhouse gas emissions by weight.
- Initiatives to reduce greenhouse gas emissions
- Emissions of ozone-depleting substances by weight.
- NO_x, SO_x, and other significant air emissions
- Reduction of water, air and desert discharges
- Reduction of total weight of waste
- Total number and volume of significant spills.
- Secure management of waste
- Identity, size, protected status, and biodiversity value of water bodies and related habitats

significantly affected by the reporting organization's discharges of water and runoff.

Aspect: Products and Services

- Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.
- Percentage of products sold and their packaging materials that are reclaimed by category.

Aspect: Compliance

- Monetary value of significant for noncompliance with environmental laws and regulations.

Aspect: Transport

- reduction environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.

Aspect: Overall

- Total environmental protection expenditures and investments by type.
- Develop structures with respect to the environment
- Pollution control due to the company's business
- Compliance of the company with the standards for pollution

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