



## Exploring organizational accountability in relation to climate change: Where do Greek corporations stand?

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### Abstract

An increasing number of large corporations around the world engage in accounting for and reporting on their plans and measures towards climate change, as part of their environmental responsibility agenda. Using a disclosure index, this study investigates the status of the disclosure practices of the top 100 companies operating in Greece with respect to the pivotal issue of climate change. Determinants which drive Greek companies to publicly disclose such information are examined while overlapping perspectives for the Greek case are outlined. The analysis suggests that only a small group of leading Greek companies appears to endorse a climate change discourse as an instrument of empowering stakeholders' decision-making. Most other corporations still tend to disregard disclosure practices of their actions towards this global issue.

**Keywords:** Climate change, corporate disclosure, regression analysis, corporate social responsibility, content analysis, Greece.

### 1. Introduction

Climate change poses potentially unprecedented threats to modern societies and reflects a much-debated issue as it is strongly interlinked with current lifestyles and development policies. While scientific assessments suggest that the overall impact from climate change is most likely unpredictable, they seem to denote that extreme weather conditions are to be expected among the various geographical regions in the years to come. Moreover, such unpredictability refers to significant changes in the distribution of precipitation, affecting the intensity and frequency of draughts and floods, severe disease and pest outbreaks and well as widespread fires in forested areas.

The need for co-ordinated action to mitigate climate change impacts is an essentially complex public policy problem of modern times; a problem where meaningful actions from the business community should represent a key component in shaping effective policy responses and appropriate mitigation measures. Given the difficulties of the global community in defining concrete ways to confront climate change, the exploration of the discretionary disclosure of organizational responses to climate change makes a useful endeavour. Moreover, under the critical circumstances climate change posits, companies need to maintain the support and approval of their stakeholders by introducing or refining practices that will counteract possible legitimacy threats or risks related to climate change.



## 2. Background – Conceptual underpinnings

Discretionary corporate climate change disclosure (CCD) has been identified as a valuable legitimization instrument which can mitigate conflicts with stakeholders and a practice with a mediating effect in convincing societal members that the organization is fulfilling their expectations (Dowling and Pfeffer, 1975; Lindblom, 1994). The concept of legitimacy according to Dowling and Pfeffer (1975, p.122) is defined as “a condition or status which exists when an entity’s value system is congruent with the value system of the larger social system of which the entity is a part’ and add that ‘when a disparity, actual or potential, exists between the two value systems, there is a threat to the entity’s legitimacy”. Legitimacy theory posits a systems-oriented perspective to the business-and-society relationship, where the firm influences and is influenced by the social context within it operates. It sets forth a form of a ‘social contract’ where society provides the company with a range of resources to conduct its activities along with an overarching ‘licence to operate’, in return for the provision of socially acceptable (i.e. legitimate) business conduct (Mathews, 1993; Deegan, 2002). Whenever the organization’s operation is not meeting the society’s set of norms and values then the latter can revoke its ‘licence’ and for the firm to retain its legitimacy practical demonstrations of adherence to such expectations are essential.

According to Gray et al. (1987), such disclosure practice refers to “the process of communicating the social and environmental effects of organizations (particularly companies) beyond the traditional role of providing a financial account to the owners of capital, in particular shareholders. Such an extension builds upon the assumption that companies do have wider responsibilities than simply to make money for their shareholders” (Gray et al., 1987, p. 9). In line with the multidimensionality of the corporate social responsibility (CSR) construct, CCD encompasses a diverse range of information, including vision and strategic posture to address climate change, risks and opportunities arising from climate change, investment plans to mitigate operational impact and control emissions, quantitative information of greenhouse gas emissions, voluntary initiatives to reduce emitted greenhouse gases, etc.

A considerable number of the largest corporations around the world adds emphasis and allocates resources towards climate change mitigation plans and measures (Carbon Disclosure Project, 2013). In this respect, corporations are called upon to shape voluntary disclosure practices for such courses of action in order to address potential legitimacy deficits (Kolk, 2008). Indeed, the overlapping and multifaceted impacts of climate change are acknowledged as significant and far-reaching for business (Business Roundtable, 2007). Still, relevant corporate communication channels which incorporate such considerations leave much to be desired with Doran et al. (2009) to indicate that a mere 24% of the Standard and Poor’s (S&P) 500 companies referred to climate change in their SEC filings.

CCD has received increased attention in the academic literature with a growing number of empirical studies to explore this aspect of corporate accountability. In this regard, two dominating groups of research streams are identified. A considerable number of scholars focus on trends and patterns of CCD in specific national-regional and/or industries while another group of studies attempts to shed light on determinants and predictors of CCD (e.g. Stanny and Ely, 2008; Freedman and Jaggi, 2009).

With this in mind, this study aims to make empirical contributions to the prior literature by shedding light on the comprehensiveness of CCD by large firms in Greece and investigate a number of determinants for such disclosures. Next, the hypotheses of



the study are described along with the methods employed and the sample identification. The following section presents the analysis of data and relevant findings. In the final section, implications are discussed and remarks regarding the Greek case are drawn.

### 3. Hypotheses development

Prior research suggests a positive relationship between corporate size and the extent to which corporations disclose information (Ahmad et al., 2003; Freedman and Jaggi, 2009; da Silva Monteiro and Aibar-Guzmán, 2009; Stanny and Ely, 2008). Larger organizations encapsulate high public visibility and significant social and environmental impacts (Watts and Zimmerman, 1986). They also have more resources to invest in CCD (Belal, 2001) and aim to present a positive image towards their stakeholders. Therefore, we hypothesize that:

H1: CCD of Greek firms is dependent on organizational size.

Literature also suggests a strong industry effect on environmental and social disclosure. In particular, companies in the mining, oil and chemical sectors seem to disclose more information regarding environmental management and employees' health and safety measures (Line et al., 2002), while the financial sector, and the tertiary-service sectors in general, seem to give more emphasis to labour practices, product responsibility and broader social issues (Line et al., 2002). In addition, corporations in sectors with high environmental sensitivity tend to disclose more information regarding their environmental performance than others (Hackston and Milne, 1996; Patten, 1991; Roberts, 1992; Ahmad et al., 2003; da Silva Monteiro and Aibar-Guzmán, 2009). Finally, business organizations with high proximity to the final consumer (i.e. companies of the banking, retailing, utilities or food and beverages sector) are expected to provide more non-financial information in general (Arulampalam and Stoneman, 1995), since promoting a positive corporate image that assures responsible conduct, increases brand loyalty and motivates consumers to buy products of the specific brand (Meijer and Schuyt, 2005). Thus, we postulate the following hypotheses:

H2: CCD of Greek firms varies by business sector.

H2a: Greek companies pertaining to environmentally sensitive sectors will provide more CCDs.

H2b: Greek companies with high proximity to the final consumer will provide more CCDs.

Prior findings on the relationship between business profitability and non-financial disclosure are ambiguous (e.g. Belkaoui and Karpik, 1989; Patten, 1991; Roberts, 1992). Nevertheless, increased profitability can have a direct effect on the extent of environmental and social disclosure (Bo, 2009). Supporting arguments for this claim point out that a profitable organization is more exposed to social scrutiny (Ng and Koh, 1994), and is most likely managed by skilled and insightful executives who can potentially foresee the benefits of social responsiveness (Belkaoui and Karpik, 1989), but mostly that it has the available economic resources to engage in voluntary disclosure (Hackston and Milne, 1996; Roberts, 1992). Thus, the following hypothesis is postulated:

H3: CCD of Greek firms is dependent on profitability.

Chapple and Moon (2005) argue that the level of internationalization of a firm can lead to increased CSR and, in our case, to increased CCD efforts. They denote that "...as businesses trade in foreign countries, they see the need to establish their reputations as good citizens in the eyes of new host populations and consequently will



engage in CSR as part of this process” as well as that “...the emerging systems of world economic governance create incentives for greater CSR” (p. 419). In a similar vein, Cooke (1989) and Tang and Li (2009) stress that a firm’s presence in foreign markets postulates that it is bound to disclose more comprehensive information in line with the reporting rules of the foreign business system. In addition, Robb et al. (2001) offer empirical support that international presence can be a strong determinant for non-financial disclosure. In line with these arguments, we formulate the following hypothesis:

H4: CCD of Greek firms depends on their level of internationalization.

Isomorphic patterns and mimetic processes as reflected in the subscription to business coalitions and self-regulatory initiatives for promoting CSR (DiMaggio and Powell, 1983; Matten and Moon, 2008) have a mediating role in the non-financial disclosure practices of firms. In this context, the growing number of stand-alone CSR reports in Europe (KPMG, 2013) has been identified as a marking example of such processes in the homogenization of institutional environments across national boundaries (Matten and Moon, 2008: p. 412). In view of the above, we hypothesize that:

H5: Members of the Hellenic CSR Network and the Greek Business Council for Sustainable Development provide more CCDs.

Secchi’s (2006) evidence from Italy reveals that there is heterogeneity in the non-financial reporting practices of government-owned and privately-owned firms. In this respect, the size of the (notably larger) strongly bureaucratic, centralized public sector in Greece has aggravated calls for new public management techniques (Phillipidou et al., 2004). Yet, efforts towards the modernization of the state are admittedly slow and previous transformational processes have proved unsuccessful (Kufidou et al., 1997; Philippidou et al., 2004). Key factors for such failure include Greek state organizations’ resistance to change, the myopic focus on regulations, the absence of robust strategic planning, the lack of employee motivation and stimuli to undertake initiatives in order to offer and apply new thinking in the organization (Ministry of Internal Affairs, 2000 in Phillipidou et al., 2004: p. 324).

Moreover, according to preliminary arguments and tentative findings (Tsakarestou, 2004; Hackston and Milne, 1996; Tang and Li, 2009), it is reasonable to hypothesize that subsidiaries of foreign multinationals (MNCs), which have adopted a robust CSR agenda, can act as moral agents in the country and will be more active in non-financial disclosure than those companies headquartered within the country.

Finally, companies listed on the Athens Stock Exchange (ASE) constitute ‘the ‘core’ of the country’s corporate sector, represent major sectors of economic activity and form an essential driving force of the domestic economy via their linkages with other, non-listed, enterprises. These firms are not only well-known to the financial and business analysts’ community, but they tend to draw more public attention and receive more extensive media coverage than unlisted firms (Branco and Rodrigues, 2006). Given these, the following hypotheses are posited:

H6: CCD of Greek firms varies by ownership identity.

H6a. Greek government-owned and government-linked corporations provide less CCDs.

H6b: Subsidiaries of foreign MNCs provide more CCDs.

H6c: Companies listed on the Athens Stock Exchange provide more CCDs.

Finally, prior literature suggests that companies with greater exposure to social scrutiny have a strong incentive to employ disclosure in an attempt to address the



negative effects of such exposure on organizational image and reputation (Hughes et al., 2001; Patten, 2002; Cho and Patten, 2007, Cho et al. 2012). In Greece such firms are those located in the environmentally degraded area of Asopos area which has been on the headlines for over a decade for incidents of heavy pollution of the underground water reserves due to high concentration of hexavalent chromium residues and an associated high cancer rate of the local population. Over the years, calls for increased environmental and social responsibility have been expressed by governmental bodies and inspector agencies as well as local communities and NGOs regarding their operation. With this in mind, and taking into account the conceptual underpinnings of legitimacy theory we hypothesize that:

H7: Companies facing intense social scrutiny and pressure will provide more CCDs.

#### 4. Material and methods

The sample used in this study consists of the 100 largest companies operating in Greece (based on annual revenues) according to the ICAP's annual "Greece in Figures" report. Out of the companies in question, 32% belong to the manufacturing sector, followed by firms engaged in trade/retail activities (31%), the banking-insurance sector (12%) and the utilities sector (11%). No other business sector yielded more than 10% of the sample (construction and building materials firms represent 6% while firms pertaining to other tertiary/service sectors represent 9% of the sample). Moreover, 36% of the firms are listed in the ASE, 7% are government-owned, and 29% are privately-owned while 28% are subsidiaries of foreign multinationals.

In order to explore the publicly available CCDs, a web-based search was performed during the first quarter of 2011, locating the official websites of the sample companies and all the related information (annual reports, environmental statements, press releases, webpages, etc.) was identified. In cases of annual, stand-alone, non-financial reports (environmental, health and safety, CSR and/or sustainability), the most recent one was included in the analysis. Among the 100 corporate websites, one was under construction while three foreign subsidiaries redirected interested parties to the global website of the parent company.

CCD is assessed according to a numerical grading scheme where zero for equals to non-disclosure, 1 if the organization discloses brief and/or insufficient information and 2 if it provides extensive coverage and/or comprehensive material on the specific topic.

Independent variables

Company size is measured by the number of employees and turnover (% of variance explained = 76.5%).

Business sector is measured by a six-scale dummy variable pertaining to the segmentation of the top Greek firms presented in the sample's description.

Profitability is measured using return on equity (ROE) and return on assets (ROA) (% of variance explained = 84.6%).

Internationalization is operationalized by the percentage of sales exported to other countries as well as by the number of countries, besides Greece, where the organization operates (% of variance explained = 67.1%).

Environmental sensitivity, consumer proximity and subscription to CSR initiatives are also expressed by a binary zero/one dummy variable, where one designates a company falling in these categories and zero if it does not.



Ownership identity is measured by a four-scale dummy variable pertaining to the segmentation of the top Greek firms presented in the sample's description.

Social pressure is measured by a binary zero/one dummy variable to distinguish between the companies operating in the greater Asopos area and the rest of the companies.

#### Ordinal Logistic regression analysis

To identify those factors which (statistically) significantly influence CCD of Greek companies and for the construction of a statistical model we have opted for fitting a logistic regression model to the data collected. This has important ramifications for the guiding hypotheses we have formulated. In such a model the outcome variable is predicted from a combination of most important prior/predictor variables employed in the model. A set of independent variables both categorical and continuous quantitative can be employed, investigating the possibility of an event to occur which is represented by a categorical dependent variable. With ordinal logistic regression, the categorical regression quantifies categorical data variables to yield numerical values to the categories, aiming at the optimal linear regression of transformed variables (Agresti, 2012). The ordinal logistic regression model is a modified model of binary logistic regression, incorporating the categorical nature of the dependent variable defining the different categories. If the categories of the dependent variable is  $j$  then the odds ratio for each category is:

$$\theta_j = \text{prob}(\text{category} \leq j) / \text{prob}(\text{category} > j), \text{ or} \quad (1)$$

$$\theta_j = \text{prob}(\text{category} \leq j) / 1 - \text{prob}(\text{category} \leq j)$$

The ordinal logistic regression model for each dependent category is then:

$$\ln(\theta_j) = \alpha_j - (\beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n) \quad (2)$$

where  $j$  takes values from 1 up to the number of classes -1 and  $n$  is the number of independent variables. The negative sign of the coefficients indicates that the major factors associated with larger categories. When we have a positive coefficient in a category of an ordinal logistic regression categorical predictor we have indications that belonging to this category increases the odds of being in a higher level of the dependent. Likewise, negative coefficients indicate that a decrease in odds is more likely. For a continuous variable, the positive coefficient indicates that with increasing the value of this variable then the probability for the higher categories is increased. This means less cumulative probability for the lower categories as they are less likely to occur.

In this study, the logistic regression analysis is performed in order to examine which of the research variables have the greatest power in predicting the ordinal variable of CCD. The econometric analysis was performed using the statistical package SPSS 19.0 (SPSS, 1999) including the descriptive analysis of individual variables from the questionnaire, and the analysis of qualitative variables using ordinal logistic regression, attempting to identify potential characteristics which affect the views of business organizations on issues such as climate change.

A stepwise selection procedure (backwards elimination) was utilized for obtaining the most significant predictor estimates in model fitting, avoiding in this way overfitting. Also, goodness-of-fit measures are reported for assessing the adequacy of model fit.

## 5. Results

### 5.1 Descriptive results

As concerns the CCD behavior on behalf of the companies operating in Greece, the descriptive analysis of our sample shows that the sizable majority of the companies (74%) take no measures at all for disclosure, with only a 12% and a 14% of the organizations disclosing brief/insufficient information and providing extensive coverage, respectively. It is obvious from the above that the dialogue potential CCD encapsulates is not utilised effectively to enable and stimulate a fruitful accountability parameter. Quantitative information is very little, mostly located in CSR reports and absent from annual reports and investor relations statements.

The following table (Table 1) presents spearman's correlation coefficients ( $\rho$ ) between the various categorical items utilized in the subsequent statistical analysis. Most significant correlations exist between sector and type of activity ( $\rho = 0.807$ ,  $p$ -value<0.001), consumer proximity and environmental sensitivity ( $\rho = -0.554$ ,  $p$ -value<0.001) and CCD and CSR initiatives ( $\rho = 0.532$ ,  $p$ -value<0.001).

**Table 1:** Spearman's correlations for the ordinal variables

	CCD	Social Pressure	Sector	Ownership identity	Environmental sensitivity	Consumer proximity	CSR initiatives
CCD	1						
Social Pressure	0,146	1					
Sector	0,025	-,367(**)	1				
Ownership identity	-,258(**)	-0,186	-0,189	1			
Environmental sensitivity	,212(*)	0,179	,240(*)	-,223(*)	1		
Consumer proximity	0,066	-0,009	,213(*)	0,031	-,554(**)	1	
CSR initiatives	,532(**)	0,071	0,044	-0,142	0,174	-0,058	1

\*\*Correlation significant at the 0.01 level (2-tailed). \*Correlation significant at the 0.05 level (2-tailed).

### 5.2 Results of statistical analysis

The results of adapting appropriate ordinal logistic regression model are included in the following table, where CCD is employed as the dependent variable. Specifically, Table 2 shows results (estimates regression coefficients, corresponding 95% confidence limits and the statistical significance) of the ordinal logistic regression model where we assess the effects of the various companies' characteristics on CCD. Table 2 refers only to the significant predictors of the ordinal logistic regression analysis. As one observes, most important predictors of CCD are the company size, ownership identity and subscription to CSR initiatives. The rest of the initially hypothesized predictors were not deemed significant from the results of the analysis.

Most of the predictors are only marginally important with only company size to appear as having a substantial effect on CCD (beta = 3.348,  $p$ -value<0.001). Thus, for company size, we would say that for a 1 unit increase in company size we would expect a 3.348 increase in the ordered log odds of being in a higher level of CCD (i.e. comprehensive climate change information). On the contrary, companies that are not subscribed to domestic CSR initiatives are decreasing the log odds of being in a higher level of climate change policy.

The same holds for those companies that are listed in ASE, when compared with all other company categories (i.e. companies that are subsidiaries of foreign company, Privately/Government-owned companies). Those listed in ASE have a reduced probability on presenting detailed information with relation to climate change.

**Table 2:** Parameter estimates and corresponding significance for the ordinal logistic regression model

Dependent variable: Climate Change Disclosure (reference category: Comprehensive information)			
Parameter	estimate	95% C.I.	p-value
Non disclosure	-7.478	(-426, 411)	0.972 (n.s.)
Brief information	-5.281	(-423, 413)	0.980 (n.s.)
Company size	3.348	(1.139, 5.557)	0.003***
Ownership Identity (reference category: Subsidiary of foreign company)			
Listed in ASE	-2.064	(-4.274, 0.146)	0,067*
Privately-owned	-1.425	(-3.51, 0.659)	0,180 (n.s.)
Government-owned	-24.344	(267.1, 218.45)	0,844 (n.s.)
Subscription to CSR initiatives (reference category: YES)			
No	-1.56	(-3.155, -0.036)	0.055*
Pseudo R Square			
Cox & Snell R Square	0.778		
Nagelkerke R Square	0.99		
McFadden	0,99		

(\*) coefficient is significant at a 10% level of significance

(\*\*) coefficient is significant at a 5% level of significance

(\*\*\*) coefficient is significant at a 1% level of significance

n.s.: non-significant

As concerns the model's adequacy, the Nagelkerke's pseudo-R was 0.99, and Cox and Snell R-square 0.778, indicating a good fit. In overall, the corresponding final estimated regression equation for the dependent category of comprehensive information for the CCD is given by:

$$\ln \left( \Pr \left( \frac{\text{non comprehensive information}}{\text{comprehensive information}} \right) \right) = -5.281 - (3.348 * XSIZE - 2.0 * XLISTED INASE - 1.56 * XNO CSR INITIATIVES) \quad (3)$$

As a consequence of the latter analyses, we may state that our hypotheses postulations are only partly verified, by only accepting hypotheses H1, H5 and H6<sup>72</sup>, rejecting all of the rest.

<sup>72</sup> Note that although we have found evidence that CCD of Greek firms varies by ownership identity (H6), sub-hypotheses H6a, H6c were not verified, with only subsidiaries of foreign MNCs been found to provide more CCDs as hypothesized (H6b).

## 6. Concluding remarks

Deegan et al. (2002) assert that “where there is limited concern, there will be limited disclosures” (p.335). In this respect, our findings suggest that Greek companies are most likely overlooking or disregarding CCD. Apart from a very small sub-group of Greek firms actively engaged in the endorsement of CCD practices, most other assessed corporations tend to treat such accountability perspectives superficially and in a ‘window-dressing’ manner, offering primarily self-laudatory information. Given that gathering and sharing climate change information can be conceived as a reflection of a firm’s related performance as well as a useful ‘proxy’ to assess it (Snider et al., 2003), most assessed firms appear to undertake inadequate actions towards the identification of their exposure to climate change risks and implicit opportunities.

Such information deficit fails to inform stakeholders’ decision-making and adds very little to environmental policy and planning. Yet, domestic market forces (suppliers, customers, investors, creditors, etc.) and bottom-up pressures (from civil society actors and the wider public) in challenging the environmental accountability of business have so far been weak and sporadic in Greece. Awareness, interest and knowledge in environmental management are low (Kassolis, 2007) while ‘domestic mobilization’ (Börzel, 2003) has generally been slack. Stakeholders’ demands and expectations have so far proved to be moderate in stimulating the Greek business community towards consistent environmental reporting and meaningful environmental management.

Future research should investigate CCD in other national contexts using more detailed content analysis approaches. Moreover, longitudinal analysis of CCD could contribute in examining whether and how the recent economic downturn affected the climate change discourse of corporations. Finally, action research and qualitative evidence could shed light on where climate change stands among the various corporate reporting aspects and, ultimately, provide additional insights into factors that determine accountability responses towards this global concern.

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