

# STAKEHOLDER INFLUENCE ON ENVIRONMENTAL PROACTIVITY OF BRAZILIAN COMPANIES

## Abstract

This paper analyzes stakeholders influences on environmental proactivity of Brazilian companies. Research related to 112 Brazilian companies was undertaken to test the hypothesis that stakeholders pressure has a positive influence on company environmental management activities. Factorial analysis grouped the stakeholders into two categories called “market” and “non-market”. The market category involves those stakeholders which participate directly into the supply chain and includes suppliers, clients, international and domestic competitors, employees, subcontractors and unions. “Non-market” stakeholders, in turn, are those which do not participate directly in the supply chain such as shareholders, government, media and NGOs. Econometric models demonstrated that stakeholders exert significant and positive pressure on environmental proactivity actions, related planning, operations and communication practices. This pressure is more effective when coming from the so-called “non-market” stakeholders, which indirectly influence the organizations. The paper shows that sustainability ideas and practices are increasingly present on stakeholder agendas, which are starting to acknowledge their interdependences and their power to influence companies to adopt proactive environmental practices.

**Key words:** environmental management, environmental pressure, environmental proactivity, strategy, stakeholders, sustainability.

## 1 INTRODUCTION

Scott and Meyer (1991) stated that organizations operate within an institutional framework that establishes regulations and general operating environment. The institutional framework is dynamic and reflects specific pressures from society, business or government directed at a particular actor (company). As a result, the company may initiate certain practices not undertaken earlier, change practices related to a particular area of responsibility or stop a certain action.

Companies are subjected to different types and degrees of pressure depending on their organizational characteristics and the particularities of the institutional framework within which they operate. Company responses can range from proactive to reactive environmental behavior.

Environmental proactivity is characterized as a strategic position accepting risks and challenges of the new sustainability paradigm. Proactivity companies take actions that go beyond compliance with legal requirements to minimize environmental impact of their operations. Companies may explore opportunities to reposition their image, attract consumers who are sympathetic to environmental causes and develop innovative processes that mitigate trade-offs among economic, social and environmental issues (Sanches, 2000, González-Benito; González-Benito, 2006).

Buyse and Verbeke (2003) pointed out that organizations are pressured to respond to market demands in the way stakeholders expect. Ferraz and Mota (2002) tested a model in which the stakeholder pressures are divided along two lines: formal and informal. Formal pressures flow from regulation and surveillance entities through warnings, fines and loss of environmental licensing. On the other hand, informal pressure is exerted by others stakeholders (in particular community based groups), through market actions or complains which may lead to reduced consumption of a company's product or service.

This paper presents an empirical assessment of the positive stakeholders influence on environmental proactivity of Brazilian companies. It is based on a survey of 112 companies operating in Brazil, applying an econometric model to measure the influence of "market" stakeholder and "non-market" stakeholder. Husted and Allen (2011) define "market" stakeholders as those that have direct links with organizational performance. In turn, "Non-market" stakeholders are those involved in the societal dimension of corporate activities.

The study shows that stakeholders play a major role in the construction of a proactive environmental management framework along with business, government and society in general. This research shows the importance to define an environmental policy aiming to enhance the relationship with society and further improve the environmental performance.

The next section of this paper explores the theoretical framework which includes stakeholders' pressures and proactive environmental management models. Then, the methodology used to develop the survey among Brazilian companies is explained. We continue with a description of the results of the empirical study. Finally, we discussed the results to develop insights about stakeholder and finally, the conclusion presents the main contributions of this research.

## **2 THEORETICAL FRAMEWORK**

### **2.1 Role of Stakeholders as Agents of Environmental Pressure on Organizations**

Before turning to the literature to discuss what stakeholders are and how they are linked to organizationally, a relevant conceptual issue needs to be raised: for what and for whom is a private company responsible? Based on Freeman's perspective (1994), Barbieri and Cajazeira (2009) offer a comprehensive explanation about "the principle of what or who really matters". They confront Milton Friedman's discourse (Nobel Prize winner in the Economy category) based on the work of classical economists (Smith and Ricardo) and their logic that considers the unilateral responsibility towards stockholders. This position is also defended by Berle and Means (1984).

Barbieri and Cajazeira (2009) highlight the need to understand the multilateral nature of this issue. There are multiple dimensions of corporate impact. Thus, responsibility is not towards who has interests, but towards who is subject to impacts (Savage *et. al*, 1991). The meaning of multiple "interests" evolved to the consideration of different "stakeholders" related to an

organization. Organizations, as systemic elements, have a series of actors, called stakeholders that interact within and beyond their physical limits.

The definitions of stakeholders indicate the complexity of the individuals who are active or passively involved in the company. Freeman (1984) conceptualized these stakeholders as all individuals and groups of individuals that can affect, or are affected by, the accomplishment of the organizational purpose. Clarkson (1995) defines stakeholders as people or groups that hold or require participation or rights or interests in the corporation and in its activities. Such claims for rights or interests derive from transactions or actions taken by the organizations and can be legal or moral, individual or collective.

Among the multiple attempts to classify stakeholders, the proposal by Atkinson and Waterhouse (1997) should be highlighted. This is similar to the proposal by Clarkson (1995) which views stakeholders as being (or not being) influenced by an organization. Both authors see the important distinction as being between those that do influence an organization and those that do not. According to Clarkson (1995) stakeholders are divided between primary and secondary. A primary stakeholder group is one without whose continuing participation the corporation cannot survive as a going concern'. Secondary stakeholders are those that the organization does not directly depend upon for its immediate survival.

Carrol and Nasi (1997) suggest that a stakeholder can be defined by its position towards the border between the company and the external environment. The internal stakeholders are part of the organizational structure, and include owners, managers and employees. External stakeholders are all actors that are not part of the organization but interact with it, including competitors, government, consumers, community, media and the environment.

Buyse and Verbeke (2003) present four categories of stakeholders. The category of internal primary stakeholders includes employees, shareholders and financial institutions.

External primary stakeholders comprise domestic and international consumers and suppliers. The third category named “secondary stakeholders” involves (national and foreign) competitors, international institutions, NGOs and the media; and, finally, regulatory stakeholders, which are governments and regulatory agencies.

After establishing the multiple interests a company may be related to, it is necessary to understand what relationship stakeholders have and how they can affect an organization’s activities. In some studies, stakeholders receive a relatively important role in the analyses of decision core business. Husted and Allen (2001) and Mitchel, Agle and Wood (1997) stated that stakeholders have different influence levels among themselves and with company.

Some authors (Lyra; Gomes; Jacovine, 2009; Savage Et Al, 1991; Charron, 2007) pointed out the need for a good relationship between the company and its stakeholders on sustainability. Individual stakeholders have different levels of knowledge about organizational, performance and control capabilities. Stakeholders provide resources, generate demands and assess their actions which constitute a context of crucial interrelationship necessary for a companies’ survival.

Stakeholders require integrity, respect, standards, transparency and results (Waddock et al, 2003). Thus, company actions are conditioned by pressures received and perceived by stakeholders. Abreu et al. (2004) distinguishes three categories of environmental pressure: (a) all-pervasive environmental regulations and the consequent potential for liabilities, (b) environmental risks and (c) demands from stakeholders. The first pressure category relates to the environmental legislation and its enforcement. Hence, the more specific and severe the environmental regulation and the stricter the enforcement the stronger this type of pressure will be. Abreu (2009) indicates Brazilian particularities, such as regional and state differences in legislation and enforcement levels and the fragmentation of legal statutes ruling the

environmental sector and also different regulatory agencies in federal, state and municipal spheres.

These Brazilian characteristics have led to a complex web of environmental legislation information, making some companies hire specialized consulting services in the area (Castro Neto *et. al.* 2011). On the other hand, environmental legislation pressure could be considered beneficial to the industry if it leads organizations towards innovation and creativity in reducing environmental damages (Porter, 1999).

The second category, pressure from environmental risks associated with the industrial activity. In an analysis developed by BNDES (Bergamini Jr, 2003), industrial sectors are divided in three groups, according to the environmental risk they pose. Category A (highest risk) includes chemical, iron and steel, petrochemical and pulp industries. Examples of category B, classified as intermediary risk, include the textile, metallurgy and beverage sectors. Category C considered as low environmental risk include clothing and services companies.

As regards the environmental impacts, Delmas (2002) underlines the importance of an Environmental Management System (EMS) and environmental certifications (ISO 14001, for example), to map the environmental risks inherent in the operations as well as to manage them through environmental audits and permanent analysis of production processes.

Finally, the third environmental pressure category refers to stakeholders environmental demands which are based on their capacity to influence organizations and change their conduct and environmental performance. Stakeholder analysis is closely related to the monitoring of environment performance and to the understanding of its influence on the organization. This illustrates the relevance of mapping the elements that interact with the organization and the mutual influence between the company and its stakeholders (Charron, 2007).

Based on the context of these stakeholders characteristics related to the organization's operations, Sousa and Almeida (2003) consider two categories related to their degree of voluntary action: one active and the other passive. Active stakeholders are entitled to intrinsic rights, as propriety grants them legitimate and formal interests in the company through a voluntary relationship with the organization. On the other hand, passive stakeholders have a relationship with the organization which involves influencing the organization to avoid being impaired by its operations.

This above analysis reveals the theoretical position that an organization has a direct relationship with stakeholders. The minimal position that the organization need to have a relationship with stakeholders in order to manage its environment impacts, enhance opportunities and mitigating inherent risks (Savage et al, 1991; Bourne and Walker, 2005). Given the evolution in organizational understanding and treatment of environmental issues and different possible routes to advance in this area, corporate responsibility today faces far more complex demands than a few years ago (Arora; Cason, 1996).

According to González-Benito and González-Benito (2005), three arguments support environmental proactive practices by a company. The first is societal environmental awareness which increases organizations temerity towards its image and reputation issues. The second involves the effect of operational optimization driving from environmental efficiency practices. And, finally, the ethical dilemmas faced by the owners, managers and shareholders.

Souza (2002) pointed out that legal pressures, image issues and the demands from primary and secondary stakeholders on organizations to minimize their environmental impact guide corporate environmental management. Hence, the advancement in environmental management has led to increased studies to identify motivation for environmental proactivity and the reflections of this in company competitiveness positions.

## **2.2 Environmental Management as a Result of Stakeholder Environmental Pressure**

Henriques and Sardosky (1996) stated that environmentally proactive companies require a plan to deal with environmental issues. Companies have a choice between adopting proactive environmental behavior or reactivity approach. Companies adopting a proactive approach must have a legitimate plan of action indicating the appropriate elements of environmental management system.

Berry and Rondinelly (1998) raise the environmental proactivity concept and distinguish three stages of environment policies evolution. The first one is business policies without any environmental concern (until the end of the 1970's), then compliance policies with environmental rules, developed in the 1980's, and currently the new strategic policy involving environmental management.

Sanches (2000) establishes a continuum from self-regulation behavior to the concept of environmental proactivity. In this concept, environmental management is internalized as a management process and, therefore is included in the company's strategy along with objectives and resources to achieve a environmental performance beyond the requirements of legal compliance.

González-Benito (2009) refers to environmental proactivity as going beyond actions to improve the efficient use of natural resources. The approach needs to reflect a mature environmental management system. González-Benito and González-Benito (2006) define environmental proactivity as a set of practices, which companies put in practice voluntarily to improve their environmental performance, manifested through business strategies, divided in three categories of planning, operation and communication practices.



Organizational and planning practices reflect the extent to which an environmental management system has been implemented. It involves the definition of environmental policy, objectives, targets and responsibilities and selection of employees dedicated to environmental management. It also comprises environmental training and awareness programs for managers and operators, and the definition of indicators that are capable of measuring and assessing environmental performance. The environmental management system does not only mitigate environmental damage, but also establishes mechanisms that allow a company to advance in a coordinated and systematic manner.

Operational practices imply changes in the operation and production systems. These practices can be related to the product or the process. In the first case, they involve the project of “green” products and services. For example, procedures are defined focusing on the reduction of pollutants or toxic products; on the reduction of water or energy consumption; on the expansion of product recycling or remanufacturing capacity. The second group is focused on the development of more “environmentally conscious” operational processes and methods. Some of these practices affect internal processes and incorporate remedial and control practices (e.g. installation of filters or effluent treatment plant) and also pollution prevention practices. Other practices affect the external processes (e.g. definition of criteria to select suppliers or the use of recyclable materials in packing) and influence the supply and distribution chains.

Finally, communication practices involve not only reports on the companies’ financial performance, but also on its social and environmental impacts. These practices are intended to communicate the actions taking by the company in favor of the natural environment. Although they are important from a commercial or marketing point of view, they do not significantly contribute to improve the environmental performance. On the other hand, stakeholders appreciate

these practices and it is important to define the company's image related to environmental performance.

González-Benito and González-Benito (2010) once again address the theme and propose environmental proactivity as an “essential variable in a modern competitive scenario”. They consolidate the motivation factor as a distinction between “minimal compulsory changes though compliance with legal rules” (environmental reactivity or zero environmental proactivity) and “voluntary measures taken to reduce the company's environmental impact”. Thus, environmental regulations and compliance cannot be taken as a decisive factor in business decision process. González-Benito and González-Benito (2006) pointed out that organizations take a stand towards environmental issues through a reactivity-proactivity continuum.

Criticism against the environmental proactivity concept involves organizations' behavior beyond legal compliance. Environmental proactivity needs to be considered as a regular or emerging corporate strategy that participates in corporate planning, and not simply associated with it as voluntary action.

Environmental proactivity is aligned with different theoretical approaches, including the “New Approach” (Donaire, 1994; Porter; Linde, 1995), strategic environmentalism (Hoffman, 1999), the category of activist companies (Brockhoff; Chakrabarti, 1999), the need for repositioning and use of innovation (Porter; Linde, 1995), the creation of sustainable value (Hart; Milstein, 2003) and the strategic policy profile (Berry; Rondinelli, 1998).

In this study, environmental proactivity is defended as a modern stage of environmental management organizations through which organizations adapt to the contemporary demands of the triple bottom line. Advances in market competitiveness increase a company performance. On the other hand, environmental reactivity is the corporate behavior model in which the

environmental issue in companies is considered as a liability and an obligation to fulfill the legislation.

The theoretical framework supports the hypothesis that environmental proactivity is motivated by environmental pressure. Stakeholders exert pressure on the organization to control the environmental impact and act according to the sustainability paradigm. The organization reacts to this pressure as a strategy to defend its image, seek market opportunities position and solve the demands it is confronted with.

### **3 METHODOLOGY**

In this exploratory research, a quantitative strategy is applied by means of a survey. According to Martins and Teóphilo (2007), surveys are appropriate for those cases in which the researcher wants to answer questions about the distribution of a variable. Econometric analysis based on simple and multiple regressions was chosen, supported by exploratory factorial analysis. The regression models tested the effect of stakeholders' pressure (independent variables) on environmental proactivity (dependent variable) following the approach proposed by González-Benito and González-Benito (2006, 2010).

A questionnaire developed for this research was divided into two parts. In the first part, companies were asked to rank 19 possible stakeholders in terms of their company environmental proactivity. Five-point Likert questions were defined to measure the intensity of the pressure exerted by individual stakeholders. Interviewees answered on a scale from 1 "very weak pressure" to 5 "very strong pressure".

The second part of the questionnaire examined company environmental proactivity based on questions developed from the model of González-Benito and González-Benito (2006).

Questions concerned the environmental planning, operations and communication practices of the company. The “planning practices” questions examined organizational structure necessary to establish a proactive environmental management system. When “operational practices” have been systematically implemented, the company can inform the stakeholders about its advances and efforts to improve its environmental performance through “communication practices”. In the study, a Likert scale was used, ranging between 1 “practice not implemented” and 5 “fully implemented practice”.

The study population consisted of companies having operations in Brazil. A pilot study was undertaken, in which ten companies were interviewed. Then, the questionnaire was refined to focus more directly on the research objective. Data were collected using to the website of the Institute for Manufacturing (IfM) of the University of Cambridge. Company managers were requested by telephone to participate in the research and then the link was sent to them by e-mail. Questionnaires were collected on the IfM website between January and October 2009.

The survey resulted in 112 fully answered forms out of 2,189 downloads. Excluded cases included multiple response of individual companies where either environment, health and safety department or the highest ranking responded was included. According to Hair et al. (2009), this sample size (112 cases) permits both factorial analysis and econometric modeling.

The data were examined for missing values and outliers but no case were found. The Kolmogorov-Smirnov test was applied to identify data normality. All the results showed normal distribution justifying the fact that data followed the five point Likert scale.

Bartlett’s sphericity test was employed to check the hypothesis that the data constitute an identity matrix and the KMO – Kaiser-Meyer-Olkin test was used to test partial correlations between the variables. According to Hair *et. al.* (2009), a statistically significant Bartlett

sphericity test ( $p\text{-value} < 0.05$ ) indicates that the variables are sufficiently correlated to proceed with the analysis.

In addition, exploratory factorial analysis was undertaken to explore the hypothesis that the latent dimensions explain a complex phenomenon. This multivariate analysis technique identifies latent factors that are not directly observable, based on a set of observable variables (Hair *et. al.*, 2009; Gosling; Gonçalves, 2003). The hypotheses underlying the factorial analysis are more conceptual than statistical (Hair *et. al.*, 2009).

There are two ways of choosing the number of factors to be considered in a factorial analysis. The first is to use statistical criteria, produced in the analysis, to make the decision. The most common criteria are an eigenvalue higher than one or a percentage of explained total variance higher than 40%.

The second way is to specify the number of factors that need to be generated. This method is used when researchers have a theoretical model related to the issue or preliminary evidence that they want to validate (Hair *et. al.*, 2009). In this study, this second criteria was adopted, by selecting only those variables with a factor loading higher than 0.4. Hair *et al.* (2009) report that, although factor loadings between 0.3 and 0.4 are minimally acceptable, values superior to 0.5 are generally considered necessary for the sake of the practical significance of the indicators for each factor generated.

The factorial analysis was used to select the two independent variables groups: Market Stakeholder ( $Stk_{mkt}$ ) and Non-market Stakeholder ( $Stk_{Nmkt}$ ) pressures and the dependent variables: environmental proactivity ( $EMS$ ), and proactivity disaggregated into planning ( $EMS_{planning}$ ), operation ( $EMS_{operation}$ ) and communication ( $EMS_{communication}$ ) practices. These variables were calculated for each company using simple arithmetic means of the likert scale results.

A simple regression model (model 1S) was applied to measure the influence of the market stakeholders on environmental proactivity. Next, the non-market stakeholder variable was added, resulting in a multiple regression model (1M model). This procedure was repeated for models 2, 3 and 4, which measures the (market and non-market) stakeholders' influence on the planning, operation and communication practices, respectively. Thus, the theoretical and methodological approach serves to test the proposed models based on the following hypotheses:

**Model 1** – Effect of stakeholders influence on environmental proactivity as a whole

$$(S) > EMS_i = \beta_0 + \beta_1 Stk_{mkti} + \mu_i$$

$$(M) > EMS_i = \beta_0 + \beta_1 Stk_{mkti} + \beta_2 Stk_{Nmkti} + \mu_i$$

*H<sub>1</sub>: Does stakeholders' pressure exert positive influence on environmental proactivity of companies in Brazil?*

**Model 2** – Effect of stakeholders on the adoption of environmental planning practices

$$(S) > EMS_{planningi} = \beta_0 + \beta_1 Stk_{mkti} + \mu_i,$$

$$(M) > EMS_{planningi} = \beta_0 + \beta_1 Stk_{mkti} + \beta_2 Stk_{Nmkti} + \mu_i,$$

*H<sub>2</sub>: Does stakeholders' pressure exert positive influence on the adoption of environmental practices of companies in Brazil?*

**Model 3** – Effect of stakeholders on the adoption of operational practices

$$(S) > EMS_{operationi} = \beta_0 + \beta_1 Stk_{mkti} + \mu_i,$$

$$(M) > EMS_{operationi} = \beta_0 + \beta_1 Stk_{mkti} + \beta_2 Stk_{Nmkti} + \mu_i,$$

*H<sub>3</sub>: Does stakeholders' pressure exert positive influence on the adoption of operational practices of companies in Brazil?*

**Model 4** – Effect of stakeholders on the adoption of communication practices

$$(S) > EMS_{communicationi} = \beta_0 + \beta_1 Stk_{mkti} + \mu_i,$$

$$(M) > EMS_{communicationi} = \beta_0 + \beta_1 Stk_{mkti} + \beta_2 Stk_{Nmkti} + \mu_i,$$

*H<sub>4</sub>: Does stakeholders' pressure exert positive influence on the adoption of communication practices of companies in Brazil?*

The presentation of the results starts with a general view of the companies that participated in the research, followed by the results of the econometric models.

## 4 RESULTS

Table 1 displays the profile of the companies that participated in the survey. A limited participation of small companies is observed (19.6%), while that of medium and large companies is very similar, with 42% of the companies classified as medium and 13.4% with more than 500 employees. It is also interesting to note that 25% of the companies have 1,000 or more employees, indicating the participation of international and/or multinational companies.

TABLE 1 – ABOUT HERE

The company's industrial activity and size are indicators of the organization's economic impact. Industrial sectors included chemical manufacturing (27.7%), metallurgy companies (8%) textile companies (6.3%) and several others sectors representing all industrial activities. The main market is domestic, absorbing between 76% and 100% of the production in more than half of the companies investigated (54.5%). The large number of chemical companies is a result of numerous multinationals serving the domestic market. According to Abiquim (2010), in 2008, such chemical companies exported only 9.84% of their total production. However, with the exception of chemical companies, most respondents sell a part of the production in international markets.

The exploratory factorial analysis divided the stakeholders in two groups, as shown in Table 2. Market stakeholders exert more direct influence on companies due to their close association with company operations. This category includes domestic and international suppliers, customers, competitors, employees, subcontractors and unions. Non-market stakeholders, in turn, exert indirectly influence on companies. This category comprises investors,

shareholders, environmental agencies, international entities, NGOs, industrial associations, media, local community, indigenous communities and relatives/friends.

#### TABLE 2 – ABOUT HERE

The factorial analysis results are generally in accordance with the literature. Unions, however, fell into the market stakeholders group in this study whereas they are frequently found to be more associated with non market stakeholders. Unions are often more influential in non market issues such as labor conditions, salary, health and safety. In addition, the inclusion of the shareholders in the non-market stakeholders group was surprising. Normally, they are considered to be market stakeholders, given their power to influence the directions of the organization and their contribution of financial resources to the company. One possible explanation is that most respondents are large and publicly traded and predominantly international investors. Therefore, they are not directly linked to the company's operational activities.

The factorial analysis of environmental proactivity practices is displayed in Table 3. It is in accordance with the model established by González-Benito e González-Benito (2006). Environmental proactivity is grouped into three components: planning, operations and communication practices.

#### TABLE 3 – ABOUT HERE

Planning practices refer to the environmental strategies that the company intends to follow. The practices include the establishment of the environmental policy and the definition of environmental objectives and programs. Operational practices included investments in



environmental technologies and recycling, natural resource optimizations programs, as well as improvement of operational efficiency. Finally, the elements related to the publication of sustainability reports and the use of propaganda based on environmental performance was joined in the communication dimension of environmental proactivity.

The simple arithmetic means of each respondent's scores (identified in Table 3) were used to produce the dependent and independent variables. The hierarchical model was chosen to control collinearity effects between the independent variables. The simple regression model (1S) assesses the influence of the market stakeholders on environmental proactivity as these stakeholders are expected to exert greater influence on the organization. Next, the non-market stakeholders variable is added and a multiple econometric model is tested (1M), as shown in Table 4.

#### TABLE 4 – ABOUT HERE

The 1S model is statistically significant. In the 1M model, only non-market stakeholders exert a significant and positive influence on environmental proactivity. The level of collinearity between the variables needs to be considered though. Based on results in table 5 environmental proactivity can be forecasted relatively well based on the environmental pressure. The collinearity between the independent variables corresponds to 0.521. This fact is understandable when considering that the two variables are different dimensions of a same attribute.

#### TABLE 5 – ABOUT HERE

The explanatory power of the test ( $R^2$ ) resulted in 27.2%. This result indicates that the stakeholders' environmental pressure partially explains the organizations' environmental

proactivity. For the generalization (Adj.  $R^2$ ), the value 25.8% is also representative. The ANOVA test, which indicates the statistical significance of the regression model, showed significance at less than 1%. In addition, the test that certifies the normality of the sampling errors (Durbin-Watson) confirms a necessary condition for the certainty of the test.

Next, disaggregated models were analyzed. The independent variables were tested to check the relationship between pressure from stakeholders and specific environmental proactivity components (planning, operational and communications). Table 6 confirms the hypothesis that the environmental pressure positively influences planning activities for the market stakeholders (model 2S). In model 2M, the non-market stakeholders show significant influence while the market stakeholders became not significant.

TABLE 6 – ABOUT HERE

The model 2M also reveals collinearity between the independent variables, with a prediction level of 24.7%. The prediction power corresponds to 26% and the generalization power to 24.7%, as observed in Table 7.

TABLE 7 – ABOUT HERE

The variable operational practices were tested against stakeholder influences, as shown in Table 8. Results confirm the hypothesis that environmental pressure exerts positive influence on operational control activities (model 3S) and, in model 3Mt the non-market stakeholders exert significant influence and market stakeholders became non-significant, as in the previous model.

TABLE 8 – ABOUT HERE

Table 9 displays interesting results. While the collinearity between the independent variables corresponds to 41.6%, the prediction power for this scenario drops to 17.3% and the generalization power to 15.8%.

#### TABLE 9 – ABOUT HERE

Finally, the variable communication practices were tested against stakeholder influences, as shown in Table 9. Practices included periodical publication of sustainability reports and clear information to the public about potential environmental risks. Results confirm the hypothesis that stakeholders exert positive influences on environmental management in communication practices (Table 10). The regression behavior found in all previous models is repeated in the simple regression model (4S). The market stakeholders exert significant influence on communication practices and when included in the multiple regression model (4M) the non-market stakeholder variable is significant while market stakeholders became non-significant.

The results of all models studied show that the variables “market stakeholders” and “non-market stakeholders” are positively correlated. This correlation can be attributed to the high endogenous level between the two variables. Similarly, Al-Tuwaijri et al. (2004) found a high endogenous level among the variables economic performance, environmental performance and environmental disclosure. The authors detected that the proxy used to measure environmental performance could be endogenous. Correlations among the variables can indicate possible multicollinearity problems. As the above results show the variance inflation factor (VIF) was calculated and reveal values below the cut-off point of 10, which eliminates the multicollinearity problem in this research (Gujarati, 2006).

## TABLE 10 – ABOUT HERE

Table 11 shows a correlation index of 50.3% between the variables. The prediction power, in turn, corresponds to 25.3% and the generalization power to 23.9%. In the case under analysis, the values were also very satisfactory bordering on the levels found for the environmental proactivity variable.

## TABLE 11– ABOUT HERE

Models 1, 2, 3 and 4 confirm all hypotheses ( $H_1$ ,  $H_2$ ,  $H_3$  and  $H_4$ ) revealing the stakeholders' positive influence on the investigated companies' environmental proactivity. The hypotheses are valid for environmental proactivity as well as for the three planning, operations and communication practices components. Similarly, the “market stakeholder” and “non-market stakeholders” variables showed similar behavior in all models tested.

## **5 DISCUSSION**

The research identified a complex picture of interdependent relationships between environmental proactivity and stakeholders including market stakeholders (international suppliers; domestic suppliers; employees; subcontractors; external competitors; internal competitors; external market clients; internal market clients and unions) and non-market stakeholders (investors; funding agents; environmental surveillance agency; international entities; NGOs; industrial associations; media; local community; indigenous communities; relatives and friends).

As the survey involving companies operating in Brazil of different sizes and from different industrial sectors it is possible to confirm the hypothesis that stakeholders exert pressure on companies and positively influences their environmental proactivity. Other empirical studies support the results found in this research in showing that stakeholder's involvement encourages the adoption of environmental proactivity.

For example, Henriques and Sadorsky (1999) support the idea that environmental proactivity increases with greater pressure from organizational stakeholders (clients, suppliers, employees, unions, shareholders and funding institutions) and from community stakeholders (communities and social groups, NGOs and competitors). Environmental reactivity, on the other hand, is associated with greater pressure from regulatory stakeholders (government and supervisors). Studies developed by Klassen and Whybark (1999) confirm that the external stakeholders influence proactivity in two ways: promoting interaction with the society in general and vigilance in relation to environmental regulations. Both of these show a positive impact on the implementation of pollution prevention and control practices.

In this sense, the research reveals that non-market stakeholders exert a significant and positive influence when compared to market stakeholders. Market stakeholders by themselves influence environmental proactivity but the presence of non-market stakeholders seems to reduce such pressure and create a stronger focus on the particular aspects of the supply chain.

Frooman (1999) uses the theory of resource dependence to propose two dimensions that classify stakeholders' influence in organizational strategies. On the one hand, the market stakeholders that provide the company with resources can threaten to remove these resources or impose conditions to continue supplying resources. On the other hand, non-market stakeholders can indirectly influence of resource flow and supply chain management by the firm.

Kassinis and Vafeas (2002) also assume that communities' environmental demands that can be a proxy for stakeholders' pressure related to environmental legislation and compliance, In the case of regulatory agency pressure, our results seem to be supported by Aguilera et al. (2006). The authors affirm that the relationship drawn between government and environmental proactivity is influenced by the context of the country and its governance structure.

Despite existing difficulties, the Brazilian government has shown greater efforts to reinforce environmental compliance. The government has encouraged the creation of municipal environmental agencies, so as to decentralize and better distribute responsibilities and improve its relationship with companies. This is mainly true in large companies with significant environmental impact, like the chemical companies that were predominant in this survey. The government is considered responsible for establishing a baseline standard of compliance based on social pressures.

Thus, legal compliance supports the requirements of financial institutions which are increasingly concerned about environmental issues but has different focus and intensity depending on the company. Investors expect more efficient results when incorporating sustainable development criteria as a strategic differential into their business. Financial institutions are creating important changes in environmental proactivity by companies. Bevins (2011) stated that banks encourage this through mobilization of economic, social and political agents, and through their influence on the supply chain requirements and funding of improved production technology.

NGOs as part of an organized civil society play a major role in the expression of the society's demands. Christmann and Taylor (2002) pointed out that the NGO's actions no longer focus solely on solving issues related to government political and legal structures, but are increasingly focus on socio and environmental behavior of companies. Media coverage of

sustainability themes has become increasingly specialized in developed countries. However, in the case of Brazil, Vivarta and Canela (2006) found that the coverage of CSR practices was still superficial, unilateral and lacking in criticism.

In general non-market stakeholder pressure companies to increasing their connection with the stakeholders and pay attention to what the stakeholder are asking in relation to integrative and innovative environmental solutions. This maybe gradually creates a change in company focus from a way selling products to building relationships and confidence (Rainey, 2006).

According to Husted and Allen (2011), risk perception of company managers dealing with non-market stakeholders is enhanced by the difficult work of aligning stakeholders' demands with company objectives. When this obstacle is overcome, however, the support received from non-market stakeholders can create a powerful sense of commitment and common purpose.

## **6 CONCLUSION**

This survey contributes to further evidence that stakeholders' activities are drivers of proactive environmental management. To construct this general panorama, this study of companies operating in Brazil assessed the influence of market and non-market stakeholders on the adoption of environmental proactivity and in particular on planning, operation and communication practices.

The survey verified the influence of stakeholders' positive action on environmental proactivity. It seems that, the more articulated stakeholders' actions become the more effective is the pressure they exert on companies. The research revealed that non-market stakeholders that do not participate directly in the companies' supply chain seem to demonstrate a more mature network relative to environment issues. The results allow inference that as stakeholders gain

familiarity with company environmental impacts they manage to achieve a level of awareness and effective action.

Thus, it was identified that stakeholders and companies gradually advance towards the incorporation and integration of their environmental responsibility actions. In Brazil, the integration of these actions remains limited, which compromises their efficiency in simultaneously considering the social, economic and environmental dimensions.

Nevertheless, environmental management ideas and practices are increasingly present on the social actors' agendas. This transformation process is a start to the acknowledgement of their interconnections. Although, starting late in Brazil compared with developed countries, this transformation is showing rapid progress and simultaneously overcoming many obstacles along its trajectory. Proactive environmental management is a learning process but these practices are increasingly required for companies and stakeholders and reflect an institutional development process of the Brazilian society.

This study is not without limitations. Initially, the sample needs to be expanded to represent the Brazilian industry in general. The companies which answered the survey represent a group that is more favorable to environmental issues than industry in general. The research particularly tends to reflect the reality of the chemical industry. Nevertheless, the sample includes all types of industries and confirms that stakeholders exert significant and positive influence towards proactive environmental management. Another limitation involves the time (nine months) the research link was available on the IfM website. It is observed, however, that the changes need to implement an environmental management systems require several years. Therefore, we believe that the companies studied maintained the same environmental proactivity or reactivity profile over the survey period.



Despite these limitations, the research demonstrates that the environmental proactivity concept as “voluntary action” needs to be reconsidered. In other words, if the company receives pressure to do something and does it because of this pressure, how can one see this as voluntary action? It seems more plausible to call this response to environmental pressure “strategic positioning”. Environmental proactivity should be considered as a strategic element of survival and market balance, in accordance with the social context and laws. Therefore, this study indicates the existence of a complex network promoted by market and non-market stakeholder which influences company behavior in environmental proactivity.

## REFERENCES

- ABIQUIM. **Pacto Nacional da Indústria Química** publicado pela Associação Brasileira da Indústria Química – Abiquim. São Paulo, 2010.
- ABREU, M. C. S. How to Define an Environmental Policy to Improve Corporate Sustainability in Developing Countries. **Business Strategy and the Environment**, 18, 542–556, 2009.
- ABREU, M. C. S.; RADOS, G. J. V.; FIGUEIREDO JR, H. S. As pressões ambientais da estrutura da indústria. **RAE-eletrônica**, v. 3, n. 2, Art. 17, jul./dez. 2004.
- AGUILERA, R.V.; WILLIAMS, C.A.; CONLEY, J.M.; de RUPP, D.E. Corporate Governance and Social Responsibility: A comparative Analysis of the UK and the US. *Corporate Governance: An International Review*, 14, 147-158, 2006
- AL-TUWAJRI, S.A.; CHRISTENSEN, T. E.; HUGHES, II, K. E. The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach *Accounting, Organizations and Society*, v. 29, n. 5-6, p. 447-471; 2004
- ARORA, S.; CASON, T. Why Do firms volunteer to exceed environmental regulations? Understanding Participation in EPA's 33/50 Program. **Land Economics**. v. 72, p. 413-32, nov. 1996.
- ATKINSON, A. A.; WATERHOUSE, J. A *stakeholders* approach to strategic performance measurement. **Sloan Management Review**, 1997, Spring. 38(3), 25-36.
- BARBIERI, J.C.; CAJAZEIRA, J.E.R. **Responsabilidade social empresarial e empresa sustentável: da teoria à prática**. São Paulo: Saraiva, 2009.
- BEVINS, Vincent. Brazil's CSR Leaders: Banco do Brasil and Natura are among the corporate social responsibility leaders in Brazil, while foreign companies like Citi and Dow also push for CSR programs. **Latin Trade**. May-June, 2011
- BERGAMINI JUNIOR, S. Classificação de risco ambiental: o modelo construído no BNDES. **Revista do BNDES**. Rio de Janeiro, v. 10, n. 20, p. 197-228, dez. 2003

BERLE, A. A; MEANS, G. C. A.; **A moderna sociedade anônima e a propriedade privada**. São Paulo: Abril Cultural, 1984.

BERRY, M. A; RONDINELLI, D. A. Proactivity corporate environmental management: a new industrial revolution. **Academy of Management Executive**. v. 12. n. 2, p. 38-50, 1998.

BOURNE, L., WALKER, D. H. T. Visualizing and mapping stakeholder influence. **Management Decision**, v.43. n. 5, p. 649-660, 2005.

BROCKHOFF, K.; CHAKRABARTI, S. K. Corporate strategies in environmental management. **Research Technology Management**, Washington, Industrial Research Institute, *n.4*, v.42, p.26-30, jul./ago. 1999.

BUYSSE, K.; VERBEKE, A. Proactive environmental strategies: A stakeholder management perspective. **Strategic Management Journal**. 24, 453-570, 2003.

CASTRO NETO, F. C.O., CAVALCANTE, J. C. PITOMBEIRA, L. G., SILVA FILHO, J. C. L., ABREU, M. C. S. Fatores determinantes de proatividade ambiental em empresas cearenses: estudo de casos múltiplos. **Revista de Gestão Social e Ambiental**. , v.5, p.48 - 65, 2011.

CLARKSON, M. B. E. A stakeholder framework for analyzing and evaluating corporate social performance. **The Academy of Management Review**, Vol. 20, Nº. 1, p. 92-117, Jan. 1995.

CHARRON, D. C. Shareholders and *stakeholders*: the battle for control of the corporation. **Cato Journal**. v. 27. n. 7. 2007.

CHRISTMANN P. e TAYLOR G. Globalization and the environment: strategies for international voluntary environmental initiatives. **Academy of Management Executive**, 16, 121-135, 2002

DELMAS, M.A. The Diffusion of Environmental Management Standards in Europe and in the United States: an Institutional Perspective. **Policy Science**, 35, 91-119, 2002

DONAIRE, D. Considerações sobre a influência da variável ambiental na empresa. **Revista de Administração de Empresas**. São Paulo, v. 34. n. 2. p. 68-77, mar./abr. 1994.

FERRAZ, C.; DA MOTTA, R. S. Regulação, mercado ou pressão social? Os determinantes do investimento ambiental na indústria. Texto para discussão 863. **Instituto de Pesquisa Econômica Aplicada**. Rio de Janeiro, 2002

FREEMAN, R. E. **Strategic Management: a Stakeholder Approach**. Boston: Pitman, 1984.

FREEMAN, R. E. The politics of stakeholder theory: some future directions. **Business Ethics Quarterly**. v. 4. 1994.

FRIEDMAN, M. **Capitalismo e liberdade**. São Paulo: Abril Cultural, 1982.

FONSECA, V. S. DA; MACHADO-DA-SILVA, C. L. Conversação entre abordagens da estratégia em organizações: escolha estratégica, cognição e instituição. **Organizações & Sociedade**, v. 9, n. 25, p. 93-110, 2002.

FROOMAN, J. Stakeholder influence strategies. **Academy of Management Review**, 24 (2): 191-205.

GONZÁLEZ-BENITO Javier, The effect of manufacturing pro-activity on environmental management: an exploratory analysis. **International Journal of Production Research**, v. 46, p. 7017-7038, 2008.

GONZÁLEZ-BENITO, J.; GONZÁLEZ-BENITO, O., Perfíles de proatividade medioambiental: evidencias en empresas industriales españolas. **Universia Business Review: actualidad económica**. p. 92-101. jan-mar 2005.

GONZÁLEZ-BENITO, J.; GONZÁLEZ-BENITO, O., A review of determinant factors of environment proactivity. **Business Strategy and the Environment**, , v. 15, p. 87-102. 2006.

GONZÁLEZ-BENITO, J.; GONZÁLEZ-BENITO, O., Determinantes de la proactividad medioambiental en la función logística: un análisis empírico. **Cuadernos de Estudios Empresariales**, v. 18, p. 51-71, 2008 .

GONZÁLEZ-BENITO, J.; GONZÁLEZ-BENITO, O., A study of determinant factors of stakeholder environmental pressure perceived by industrial companies. **Business Strategy Environment**, v. 19, p. 164-181, 2010.

GOSLING, M.; GONÇALVES, C.A. Modelagem por equações estruturais: conceitos e aplicações. **FACES R. Adm.** · Belo Horizonte · v. 2 · n. 2 · p. 83-95 · ago/des. 2003.

GUJARATI, D.N. 2006. **Econometria Básica**. Elsevier Publications.

HAIR, J. F. et al. **Análise Multivariada de Dados**. 6ed. Porto Alegre: Artmed, 2009.

HART. S. L; MILSTEIN, M. B. Creating sustainable value. **Academy of Management Executive**. v. 43, n. 2. Mai/2003.

HENRIQUES, I., SARDOSKY, P. The determinant of an environmental responsive firms: an empirical approach. **Journal of Environmental Economics and Management**, 30: 381-395. 1996.

HENRIQUES, I., SARDOSKY, P. The relationship between environmental commitment and managerial perceptions of stakeholder importance. **Academy of Management Journal**, 42(1): 87-99, 1999.

HOFFMAN, A. J.; Institutional evolution and change: environmentalism and the US chemical industry. **Academy of Management Journal**. v. 42, ago/1999.

HUSTED, B. W.; ALLEN, D. B. Toward a model of corporate social strategy formulation. Proceedings of the Social Issues in Management Division at **Academy of Management Conference**, Washington D.C., Washington, Estados Unidos, ago, 2001.

HUSTED, B. W.; ALLEN, D. B. **Corporate Social Strategy. Stakeholder Engagement and Competitive Advantage**. Cambridge; Cambridge University Press, 2011.

KASSINIS, G. ; VAFEAS, N. Corporate boards and outside *stakeholders* as determinants of environmental litigation. **Strategic Management Journal**, 23 (5): 399-415, 2002.

KLASSEN, R. D. ; WHYBARK. Environmental management in operations: the selection of environmental technologies. **Decision Sciences**, 30 (3), 601-631, 1999.

LYRA, M. G.; GOMES, R. C.; JACOVINE, L. A. G. O papel dos *stakeholders* na sustentabilidade da empresa: Contribuições para a construção de um modelo de análise. **Revista Administração Contemporânea – RAC**. V.13, art. 3, p.39-52. Curitiba, 2009

MARTINS, Gilberto de Andrade; THEÓPHILO, Carlos Renato. **Metodologia da investigação científica para ciências sociais aplicadas**. São Paulo: Atlas, 2007.

MITCHELL, R. K.; AGLE B. R.; WOOD, D. J. Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts. **The Academy of Management Review**, Vol. 22, Nº. 4, p. 853-886, Oct. 1997.

PORTER, M. **Competição: estratégias competitivas essenciais**. Rio de Janeiro: Campus, 1999.

PORTER, M. LINDE, C. Green and competitive: ending the stalemate. **Harvard Business Review**, v.73, n.5, p. 121-134, 1995.

RAINEY, D.L. **Sustainable Business Development: Inventing the Future through Strategy, Innovation, and Leadership**. (Cambridge University Press, UK), pp 1- 683, 2006.

SANCHES, Carmen Silvia. Gestão Ambiental Proativa. RAE – Revista de Administração de Empresas. São Paulo. v. 40, n. 1, jan./mar. 2000.

SAVAGE, G. K.; NIX, T. W.; WHITEHEAD, K. J.; BLAIR, J. D. Strategies for assessing and managing organizational *stakeholders*. **Academy of Management Executive**. v. 5. n. 2, 1991.

SCOTT, W. R.; MEYER, J. W. The organization of societal sectors: propositions and early evidence. In: POWELL, W. W.; DIMAGGIO, P. J. (Eds). **The new institutionalism in organizational analysis**. Chicago: University of Chicago Press, 1991. p. 108-140.

SOUZA, R. S. Evolução e condicionantes da gestão ambiental nas empresas. **REAd** – Edição Especial 30 Vol. 8 No. 6, nov-dez 2002

SOUZA, A. F.; ALMEIDA, R. J. Planejamento e Controle financeiro na perspectiva da teoria dos *stakeholders*. **Revista Adm.** V.38, n.2, p 144-152. São Paulo, 2003.

VIVARTA, V.; CANELA, G. Corporate Social Responsibility in Brazil: the role of the press as watchdog. **The Journal of Corporate Citizenship.** v. 9. n. 3. p. 230-254. mar./ 2006.

## TABLES

Table 1: Number of employees in the companies

Number of employees	Qty.	%
Less than 100	22	19.6
Between 101 and 500	47	42.0
Between 501 and 1,000	15	13.4
Between 1,000 and 5,000	22	19.6
More than 5,000	6	5.4
Total	112	100.0

Source: Survey data

**Table 2:** Exploratory factorial analysis of stakeholders' influence on companies' environmental proactivity

Questions	Components	
	Market	Non-market
International Suppliers	.567	
Domestic Suppliers	.620	
Employees	.524	
Subcontractors	.539	
External Competitors	.475	
Internal Competitors	.696	
External Market Clients	.409	
Internal Market Clients	.740	
Unions	.468	
Shareholders		.556
Funding Agents		.488
Environmental Surveillance Agency		.558
International Entities		.729
NGO's		.757
Industrial Associations		.533
Media		.778
Local Community		.751
Indigenous Communities		.651
Relatives and Friends		.535

**Source:** Survey data run in SPSS for Windows – v. 17.0

**Table 3:** Exploratory factor analysis of environmental proactivity practices

Questions	Component		
	Planning	Operations	Communication
Environmental education program for employees	.613		
Assessment of environmental and health and safety risks	.733		
Senior manager for environmental issues	.047		
Employees working full-time on environmental management	.592		
Defined and published environmental policy	.750		
Clearly defined long-term environmental objectives and planning	.566		
Environmental and occupational health and safety criteria to select suppliers	.799		
Environmental and occupational health and safety criteria to assess suppliers	.771		
Periodical environmental and occupational health and safety audits	.778		
Emergency response program	.766		
Pollution treatment and control systems	.749		
Written operational procedures to control environmental and health and safety risks	.792		
Product project focused on cutting, reuse and recycling		.704	
Product lifecycle analysis		.554	
Project of productive processes focused on reduced energy and natural resource consumption		.625	
Replacement of hazardous or polluting materials in products		.553	
Investments in CO <sub>2</sub> emission reduction technologies		.638	
Energetic efficiency programs		.691	
Solid waste recycling and reduction programs		.606	
Water consumption recycling and reduction programs		.571	
Replacement of fossil fuels by renewable energies (photovoltaic, solar, wind)		.661	
Replacement of fossil fuels by alternative energy sources (natural gas, biomass, geothermal)		.572	
Use of ecological and social arguments in propaganda and communication with the public			.683
Clear information to the public about the environmental and safety and/or health risks of the product			.711
Seminars about sustainability for executives			.643
Periodical publication of sustainability reports			.738
Sponsoring of environmental events			.718
Insurance contract to cover potential environmental risks			.471
Remediation of environmental damage (liabilities)□			.646
Protection/preservation of species and habitats			.731

**Source:** Survey data run in SPSS for Windows – v. 17.0

**Table 4:** Multiple regression to assess the influence of market and non-market stakeholders on environmental proactivity

Model 1	Unstandardized Coefficients		Standardized Coefficient	T	Sig	Collinearity Statistics	
	B	Standard Error	B			Tol	VIF
<b>1S</b>							
(Constant)	1.192	0.433		2.755	0.007	1.000	1.000
<i>Market Stk</i>	0.545	0.123	0.388	4.417	0.000		
<b>1M</b>							
(Constant)	0.561	0.429		1.309	0.193		
<i>Market Stk</i>	0.225	0.137	0.160	1.636	0.105	0.699	1.430
<i>Non-market Stk</i>	0.544	0.128	0.416	4.259	0.000	0.699	1.430

Source: Research data run in SPSS for Windows – v. 17.0

**Table 5:** Test of stakeholders' influence on environmental proactivity

Model	R	R <sup>2</sup>	Adj. R <sup>2</sup>	Standard Error	Change R <sup>2</sup>	Change F	gl 1	gl 2	Durbin-Watson
<b>1S</b>	0.388 <sup>a</sup>	0.151	0.143	0.84207	0.151	19.511	1	110	1.926
<b>1M</b>	0.521 <sup>b</sup>	0.272	0.258	0.78326	0.121	18.136	1	109	

a. Estimators: (constant), Environmental Pressure of Market Stakeholders;

b. Estimators: (constant), Environmental Pressure of Market Stakeholders, Environmental Pressure of Non-Market Stakeholders

Source: Survey data run in SPSS for Windows – v. 17.0

**Table 6:** Multiple regression for test of stakeholders' influence on planning activities

Table 6. Multiple regression for test of stakeholders' influence on planning activities							
Models	Unstandardized Coefficients		Standardized Coefficient	T	Sig	Collinearity Statistics	
	B	Standard Error	B			Tol	VIF
<b>2S</b>							
(Constant)	13.866	5.656		2.452	0.016		
<i>Market Stk</i>	6.492	1.614	0.358	4.023	0.000	1.000	1.000
<b>2M</b>							
(Constant)	5.366	5.577		0.962	0.338		
<i>Market Stk</i>	2.172	1.786	0.120	1.216	0.227	0.699	1.430
<i>Non-Market Stk</i>	7.332	1.662	0.435	4.412	0.000	0.699	1.430

Source: Survey data run in SPSS for Windows – v. 17.0

**Table 7:** Test of stakeholders' influence of environmental planning activities

Model	R	R <sup>2</sup>	Adj. R <sup>2</sup>	Standard Error	Change R <sup>2</sup>	Change F	gl 1	gl 2	Durbin-Watson
<b>2S</b>	0.358 <sup>a</sup>	0.128	0.120	11.00527	0.128	16.181	1	110	1.775
<b>2M</b>	0.510 <sup>b</sup>	0.260	0.247	10.18351	0.132	19.469	1	109	

a. Estimators: (constant), Environmental Pressure of Market Stakeholders;

b. Estimators: (constant), Environmental Pressure of Market Stakeholders, Environmental Pressure of Non-Market Stakeholders

Source: Survey data run in SPSS for Windows – v. 17.0

**Table 8:** Multiple regression for test of stakeholders' influence on operational activities

Models	Unstandardized coefficients		Standardized Coefficient B	T	Sig	Collinearity Statistics	
	B	Standard Error				Tol	VIF
3S							
(Constant)	12.146	4.241		2.864	0.005		
Market Stk	4.433	1.210	0.330	3.662	0.000	1.000	1.000
3M							
(Constant)	7.736	4.372		1.769	0.080		
Market Stk	2.191	1.400	0.163	1.565	0.121	0.699	1.430
Non-market Stk	3.804	1.303	0.304	2.920	0.004	0.699	1.430

Source: Survey data processed in SPSS for Windows – v. 17.0

**Table 9:** Test of stakeholders' influence on operational control activities

Model	R	R <sup>2</sup>	Adj. R <sup>2</sup>	Standard Error	Change R <sup>2</sup>	Change F	gl 1	gl 2	Durbin-Watson
<b>3S</b>	0.330 <sup>a</sup>	0.109	0.101	8.25287	0.109	13.412	1	110	1.950
<b>3M</b>	0.416 <sup>b</sup>	0.173	0.158	7.984423	0.065	8.527	1	109	

a. Estimators: (constant), Environmental Pressure of Market Stakeholders;

b. Estimators: (constant), Environmental Pressure of Market Stakeholders, Environmental Pressure of Non-Market Stakeholders

Source: Survey data run in SPSS for Windows – v. 17.0

**Table 10:** Multiple regression for test of stakeholders' influence on communication activities

Models	Unstandardized Coefficients		Standardized Coefficient	T	Sig	Collinearity Statistics	
	B	Standard Error	B			Tol	VIF
4S							
(Constant)	6.122	0.433		1.723	0.088		
Market Stk	4.062	0.123	0.357	4.005	0.000	1.000	1.000
4M							
(Constant)	0.920	3.520		0.261	0.794		
Market Stk	1.417	1.127	0.124	1.257	0.211	0.699	1.430
Non-market Stk	4.487	1.049	0.424	4.278	0.000	0.699	1.430

Source: Survey data processed in SPSS for Windows – v. 17.0

**Table 11:** Test of stakeholders' influence on communication activities

Model	R	R <sup>2</sup>	Adj. R <sup>2</sup>	Standard Error	Change R <sup>2</sup>	Change F	gl 1	gl 2	Durbin-Watson
<b>4S</b>	0.357 <sup>a</sup>	0.127	0.119	6.91548	0.127	16.039	1	110	2.154
<b>4M</b>	0.503 <sup>b</sup>	0.253	0.239	6.42838	0.125	18.302	1	109	

a. Estimators: (constant), Environmental Pressure of Market Stakeholders;

b. Estimators: (constant), Environmental Pressure of Market Stakeholders, Environmental Pressure of Non-Market Stakeholders

Source: Survey data run in SPSS for Windows – v. 17.0