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Market Reaction to Socially Responsible Businesses in Nigeria: Evidence from Listed Manufacturing Firms

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Abstract

Over the decades, the concept of corporate social responsibility (CSR) has continued to grow in Importance and significance. The idea is to make business enterprises have some responsibilities to society beyond that of making profits for the shareholders. it connotes conducting businesses on a reliable, sustainable, and desirable basis that respect ethical values, people, communities, and the environment. Although, corporate social responsibility practices apply to all firms, the social and environmental challenges however are to a large extent associated with manufacturing firms because of the significant impact of their activities on the environment. This paper examined how markets respond to the corporate social responsibility activities of listed manufacturing firms in Nigeria. It employed correlation research design using panel data from a sample of 19 firms for a period of 6 years (2008-2013). Ordinary Least Squares (OLS) regression technique was employed in the data analysis. The study found that corporate social responsibility of manufacturing firms in Nigeria is relevant and informative to investors. Especially, the study found that corporate social responsibility on society; environmental sustainability and owners' wealth maximization have significantly impacted on the market values of listed manufacturing firms at 99% confidence level during the period covered by the study. The study however did not find evidence that corporate social responsibility on employees and regulatory compliances have any significant relationship with market values during the period under review. The paper recommends that manufacturing companies in Nigeria should double their efforts towards corporate social responsibility aimed at addressing the peculiarity of the social economic development challenges of the country (poverty alleviation, health care provision, infrastructural development, structure and education). This could send positive message to the market and enhance their value in return; it will also help create conducive atmosphere for conducting businesses.

Keywords: CSR, Capital Market, Investors, Stakeholder Theory, Market Prices

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1.0 Introduction

Over the last three decades, there has been a significant growth in the investment in Corporate Social Responsibility (CSR) both at national and international levels. This is because of the negative effect of corporate operations on the health, culture, economic and social life of the communities within which they operate. As a result, there have been a serious public responses, particularly from the human rights agencies, social investors and customers demanding organizations especially multinational companies (MNCs) to control and prevent the negative effects of their activities on the environment (Banerjee, 2008). Most recently, the concern of the United Nation (UN) through the appointment in 2005 of a United Nation's Special Representative for business and Human Rights, have outstripped the willingness of some national government to confront and more clearly articulate their own understanding of what CSR entails (Nolan, 2007).

CSR is a concept with similar processes with corporate responsibility, Corporate Sustainable Development, Corporate Citizenship, and Corporate Sustainability. Anderson (1989) sees CSR as operating a business on reliable, sustainable, and desirable basis that respect ethical values, people, communities, and the environment. While Jones and George (2003) see the term as a manager's duty or obligation to make decisions that nurture, protect, enhance, and promote the welfare and well-being of stakeholders and society as a whole. In the words of European Union (EU, 2001), CSR is where a corporation integrates social and environmental concerns in their business operations and in their interaction with their stakeholders on voluntary basis, as they are aware that, responsible behavior leads to sustainable business success. In summary, CSR entails some level of responsibility that is not liability for social and environmental issues. McWilliams and Siegel (2001) add that, CSR is more than just following the law.

While business organizations around the world are increasingly integrating CSR into all aspect of their business, critics questioned the legitimacy and value of CSR (Tsoutsoura, 2004). Some of them argue that corporations are inefficient and inappropriate agents of social change and therefore, firms have the sole social responsibility of maximizing the value of shareholders (Friedman, 1970; and Gelb and Stawser, 2001). In another view, CSR covers many issues that are traditionally addressed by government, thus, firm's resources are poorly suited for addressing social and environmental problems (Tsoutsoura, 2004).

However, in response to these, Freeman (1984) argues that, corporate entities have responsibilities to constituent groups that affect and are affected by the activities of the corporations. In addition, Preston, (1978); Waddock and Graves (1997); and McWilliams and Siegel (2001) established a significant positive relationship between CSR and financial performance. That is, firms that are involved in CSR preformed as well as or better than their counterparts that do not engage in CSR (Pava and Krausz, 1996). Similarly, the proponents of CSR assert with respect to the view that social and environmental issues are the responsibility of government; that, in view of shifting economic power, corporations should have an increasing role and responsibility for addressing social and environmental problems (Tsoutsoura, 2004). In essence, the benefits of engaging in CSR by companies includes reputation enhancement, recruiting and retaining high quality workers, charging a premium price and competitive advantage (Baron, 2001; Bagnoli and Watts, 2003).

However, one of the leading arguments for CSR recently is the internationalization of business operations, that is, the increasing dominance of Multinational Corporations (MNCs) in the developing countries. A pioneer in promoting CSR in a development context was United Kingdom's Department for International Development (DFID) by the establishment of socially responsible business unit in 1997 (Jenkins, 2005). Other efforts in support of CSR in this respect includes: the establishment of codes of conduct for transnational companies by UN, the changing view of the development agencies on the objective of development, the creation of United Nation Development Programme (UNDP); and, the decline in confidence in the role of the government as an agent for development. These together resulted in the creation of UN Millennium Development Goals (MDGs) with the goals of eradicating poverty and hunger, achieving universal primary education, reducing mortality and improving health and environmental sustainability (Jenkins, 2005). Therefore, in view of these and the increasing flows of capital to developing countries by MNCs, the development agencies see CSR as a tool for achieving the developmental goals. Parahalad cited in Jenkins (2005) states that MNCs could radically improve the lives of people and bring a more stable and sustainable world.

Although, CSR practice comprises of all firms, social and environmental challenges are to a large extent associated with manufacturing firms because of the significant impact of their activities on the modern globalized economic environment.

However, in the wake of growing CSR concerns by corporate entities both national and multinationals, Nigeria and its environs is experiencing increasing social, economic, and environmental difficulties. This is despite of the several manufacturing companies in almost all parts of the country, claiming investment in CSR. Nigeria according to UN has an estimated population of 155 million as at 2009, with average annual population growth rate of 2.1%, and surface area of 923768 square kilometers (data.un.org). This population density and the abundance of natural resources make Nigeria to be an attractive market for many businesses as well as their sources of raw material.

Ajadi (2006) identified specific drivers of CSR in Nigeria which include the failure of the government to develop the country, and the history of conflict and waste in the extractive industry in the Niger-Delta region. He therefore, suggests that CSR activities in Nigeria should be aimed at addressing the peculiarity of the social economic development challenges of the country (poverty alleviation, health care provision, infrastructural development, structure and education).

Prior studies on CSR in Nigeria focused on the multinational oil and gas companies and other multinationals. This is due to the major impact of oil and gas operations on the environment and the companies are making huge profits from their operations in Nigeria. In the same Nigerian economy, business organizations are facing infrastructural challenges which include incessant power outage, bad roads, and insecurity of investment and property (Osemene, 2012), which make business activities unstable. In his analysis, he argues that manufacturing sector is not sound due to inadequate infrastructure among other factors. Moreover, sequel to the social and economic difficulties in Nigeria, and in light of the benefits that manufacturing companies are driving from the country, society's expectations and ethical values are highly expected from the Nigerian Manufacturing sector.

With the re-emergence of CSR in the present globalized business environment, particularly in the context of tans-nationalization of business operations and the support of UN as well as other Social and Human Rights activists to improve the quality of lives of local communities, through the mechanisms of CSR, manufacturing firms in Nigeria are claiming CSR in their policies and reporting investments in CSR activities across different areas in the country. However, firms' activities particularly those with financial implications have market consequences.

Hence, the need for understanding how the market response to CSR of manufacturing companies in Nigeria.

1.1 Aim and Objectives of the Study

The main aim of this research is to assess the impact of corporate social responsibility on the market values of listed manufacturing firms in Nigeria. While the specific objectives of the research are:

i. To examine the impact of Corporate Social Responsibility in Society on the market values of listed manufacturing firms in Nigeria.
ii. To investigate the effect of environmental sustainability activities on the market values of listed manufacturing firms in Nigeria.
iii. To assess the impact of CSR with regard employees on the market values of listed manufacturing firms in Nigeria.
iv. To examine the effect of CSR value maximization on the market values of listed manufacturing firms in Nigeria.
v. To assess the impact of regulatory compliance on the market values of listed manufacturing firms in Nigeria.

1.2 Research Hypotheses

In line with the research objectives, the following hypotheses are formulated in null form;

H_{01}: Corporate Social Responsibility on Society has no significant impact on the market values of listed manufacturing firms in Nigeria.
H_{02}: Corporate Social Responsibility on environmental sustainability has no significant impact on the market values of listed manufacturing firms in Nigeria.
H_{03}: Corporate Social Responsibility on employees has no significant impact on the market values of listed manufacturing firms in Nigeria.
H_{04}: Corporate Social Responsibility on value maximization has no significant impact on the market values of listed manufacturing firms in Nigeria.
H_{05}: Compliance with regulatory requirements has no significant impact on the market values of listed manufacturing firms in Nigeria.

1.3 Scope and Significance of the Research

The increasing concerns about ethical business issues and the demand for socially responsible businesses and how their operations maximizes value in Nigeria make this study a necessity. The study is expected to benefit policy makers (Government), Human Rights Agencies, the general public, managers, shareholders and researchers. However, the study is restricted to listed manufacturing companies that are involved in the production of chemicals and similar products. The study covers the period of six years (2008-2013).

2.0 Literature Review

2.1 Conceptual Analysis

Although CSR defies definition, scholars defined the concept in relation to their understanding and the nature of the social and environmental issues involved. Jones (1980) defined CSR as the notion that corporations have an obligation to constituent groups in society other than stockholders and beyond the law or union contract, indicating that a stake may go beyond ownership. According to Frederick, Post and Davis (1992) CSR is a principle stating that corporations should be accountable for the effect of any of their actions on their community and environment. In view of Reder (1994), CSR is an all encompassing notion, and refers to both the way a company conducts its internal operations, including the way it treats its workforce, and its impact on the world around it. While Hopkins (1998) see the concept as concerned with treating the stakeholders of the firm ethically or in a socially responsible manner. He further explains that stakeholders exist both within a firm and outside and thus socially responsible behaviour will increase the human development of stakeholders within and outside the firm. In all of these definitions, CSR reflects stakeholders', social and environmental dimensions.

Woodward-Clyde (1999) defined CSR as a contract between society and business wherein a community grants a company a license to operate and in return the matter meets certain obligations and behaves in an acceptable manner. In the same perspective Kilcullen and Kooistra (1999) defined the concept as the degree of moral obligations that may be ascribed to corporations beyond simple obedience to the laws of the state.

In a broader perspective, the World Business Council for Sustainable Development (1999) defined CSR as the commitment of business to contribute to sustainable economic development, working with employees, their families, and the local communities and society at large to improve their quality of life. While in the words of Business for Social Responsibility (2000) CSR means operating a business in a manner that meets or exceeds the ethical, legal, commercial and public expectations that society has of business. It further states that, social responsibility is a guiding principle for every decision made and in every area of business. And, therefore, CSR is achieving commercial success in ways that honour ethical value and respect people, communities and the natural environment.

CSR according to UK Government (2001) refers to the private sector's wider commercial interests and the requirement to manage its impact on society and the environment in the widest sense. While CSR to the European Commission (2001), is whereby firms integrate social and environmental concerns in their business operations, and in their interaction with their stakeholders on a voluntary basis. From the same perspective, McWilliams and Siegel (2001) defined CSR as actions that appear to further some social good, beyond the interests of the firm and that which is required by law. These definitions reflects stakeholders' dimension and see CSR as voluntary activities. On the contrary, Marsden (2001) argues that CSR is about the core behaviour of firms and the responsibility for their total impact on the societies in which they operate. He further emphasized that CSR is not an optional add-on nor is it an act of philanthropy. And that a socially responsible business is one that runs a profitable business that takes account of the positive and negative environmental, social and economic effects it has on society.

Lea (2002) sees the concept as voluntary act whereby firms go beyond the legal obligations to manage the impact they have on the environment and society. According to him, the concept covers firm's employees, suppliers, customers and the community, and the extent to which firm protect the environment. However, the Global Corporate Social Responsibility Policy Project (2003) sees the concept as global corporate social responsibility and defined it as business practices based on ethical values and respect for workers, communities and the environment. Van Marrewijk (2003) refers corporate sustainability and CSR to company activities that include social and environmental concerns in business operations and interactions with stakeholders on voluntary basis.

In all these definitions of CSR, there are five definitions that are identified which include; environmental dimension, social dimension, economic dimension, stakeholders dimension and voluntariness dimension.

However, looking at the political agenda and the initiative of different international organizations, like UN Global compact and European Commission, CSR assumed a new dimension. The new dimension is based on the challenge brought about by globalization and internationalization of business operations (Aaronson and Reeves, 2002b). A review of literature by Laura et al (2008) shows that CSR public policies and some social and environmental challenges are borne by the transnationalization of business operations in a global economy. Based on this, a new concept of CSR emerged, that is, CSR is the outcome of global business operations, from which corporations will have to take responsibility of their operations on society (Zadek et al., 2001). In this regard, CSR covers all social and environmental challenges of the transnationalization of business operations, which include welfare state transformation and social governance (Laura et al., 2008). In sum, CSR in all dimensions entails some levels of responsibilities by corporate organizations that improve social, economic and environmental conditions of the communities within which corporation operate. CSR according to Reputex (2003) cited in Finch (2005) has four major components that together make organization to be socially responsible and also sustainable in the long-run; these are: Environmental impact, Social impact, Workplace practice, and corporate governance.

However, Zerk (2006) and Triple Bottom Line quoted in Norman and MacDonald (2003) argue in favour of this and summarized the components of CSR with respect to communities as follows: Economic, Social, and Environmental. Therefore, for the purpose of this research, the main focus area should be corporate CSR activities in the communities in the context of economic, social and environmental contributions.

Prior researchers have argued and documented a substantial literature on the benefits of CSR engagement, which together contribute to better financial performance and the long-term survival of a firm (deMacarthy, 2009). According to Orlitzky, Schimdt and Rynes (2003) CSR is an organizational resources from which both internal and external benefits can be derived.

The internal benefits of CSR to corporate organization are that, investments in CSR assist in developing new competences, resources, and capabilities that would be reflected in organization's culture, technology, structure, and human resources (Russo & Fouts, 1997). In addition, CSR assists organization to develop managerial competencies even if the environment is dynamic or complex, because defensive activities necessitate significant employee involvement, firm-wide coordination, and a forward-thinking managerial style (Shrivastava, 1995). However, CSR in this regard assists management in developing proper process, skills, and information system capable of strengthen the firm readiness to address external changes and crises (Russo & Fouts, 1997). Similarly, under internal benefits perspective of CSR, internal competences generated through CSR process should lead to efficient utilization of organizational resources (Majumdar & Marcus, 2001). These internal benefits of CSR according to Orlitzky *et al.* (2003) develop internal capabilities and organizational efficiency irrespective of whether CSR activities and practices are disclosed to outside stakeholders.

On the other hand, a major benefit of CSR from external perspective is good organizational reputation. Under this view, communication of CSR performance levels by firms to external constituents assist in building a positive image with customers, investors, bankers and suppliers (Fombrun & Shanley, 1990). They further state that, disclosure of high levels of CSR involvement by organization is an informational signal from which stakeholders assess organization's reputation. Organization may also use their CSR reputation to enhance their relationships with bankers and investors; therefore, CSR facilitates access to capital (Greening & Turban, 2000). Moreover, firm's CSR reputation is a mechanism for improving employees' goodwill, which will lead to an increase financial performance (Orlitzky *et al.,* 2003).

CSR is also considered beneficial according to Heal (2004) in terms of conflicts resolution between corporation and society; since most of the conflict between firms and society arise from either discrepancy between private and social costs and benefits, or different perception of what is fair. It is from this perspective that Heal (2004) asserts that CSR is mechanism through which conflicts between business organization and society can be resolved.

By extension, CSR is also beneficial in resolving environmental conflicts, that is, through careful response to environmental issues such as greenhouse emission and other environmental pollution (Heal, 2004). Capital market performance is another benefit of CSR involvement, the recent growth of socially responsible investing which is directed to socially responsible firms affect the market position of those firms positively (Heal, 2004).

Sprinkle and Maines (2010) see the benefits of CSR performance in terms of increased cash inflows to firms or reduced cash outflows. They further lament that, organizations that involved in CSR benefits from tax deductions garnered by cash and product donations, similarly, tax credits are provided to socially responsible firms by local, state and federal agencies. These tax credit incentives according to them come in terms of sale-tax exemptions and property-tax abatements.

Another critical benefit that firms drive from CSR engagement is free advertising as a result of CSR, that is, organizations that do involve in CSR performance receive coverage on local, national and international radio and television, and be the subject of articles in newspapers, trade journals, and magazines (Sprinkle & Maines, 2010). This should save firms from investing a huge amount of money on advertising and promotional activities.

2.2 Review of CSR Theories

Agency view of business entity and its responsibility to society was founded by the 1976 Nobel Memorial Prize recipient for economic science 'Friedman'. Under this perspective, managers after meeting the financial needs of the firm, they then need to be socially responsible (Finch, 2005). According to him, this can be realized through firm's governance, workplace practices and environmental and social impact and conforming to society's expectations and ethical values. This idea of using shareholders' fund to engage in CSR was criticized (Gelb and Stawser, 2001). Friedman (1970), states that the business entity is responsible only to its shareholders (owners), and its social responsibility is to maximize the value of the owners. He further stressed that engaging in CSR is a sign of an agency problem or a conflict of interest between the agents (managers) and the principal (shareholders). Based on this, he concludes that managers use CSR as a means of promoting their own social, political or career agenda at the expense of shareholders (McWilliams and Siegel, 2001).

However, the emergence of Corporate Social Performance (CSP) view in the early 1980s accounted for the shift from the agency view framework. Corporate social performance view came to light from the researches by Preston (1978) and Carroll (1979) whose study documented a CSP framework. Using the CSP framework Waddock and Graves (1997) tested the CSP model and found a positive association between financial performance and CSP. This has addressed the silent issue in agency view, where the contention remains that firm's resources are utilized in CSR without any benefit from such action. In another empirical work of Pava and Krausz (1996) which disproved the notion in agency view that, CSR would lead to reduced levels of financial performance, they found opposite and conclude that, socially responsible firms performed as well or better than their counterparts that do not engaged in CSR. One of the strength of CSP view is the philosophy of social responsiveness, social issues and economic responsibilities (Finch, 2005).

On the other hand, resource-based view is on similar framework with CSP view with the addition that, CSP not only increases financial performance but it also adds a competitive advantage to the organizations (Finch, 2005). That is, committing resources to CSR could improve financial position and the competitive advantage of firm.

Supply and demand view is credited to McWilliams and Siegel (2001). The proposed a supply and demand framework which entails that, there is a level of CSR investment that maximizes profit, while satisfying stakeholder demand is seen as important to maximize profits. This supply and demand theory of CSR places the emphasis on the stakeholders as the primary focus of all CSR activities (Finch, 2005).

Stakeholder according to Freeman (1984:46) is, "…any group or individual who can affect or is affected by the achievements of organization objectives". Stakeholder theory is built on the notion that firm is not only responsible to shareholders, but other constituents including the society who affect or are affected by the operations of the firm (Post and Preston, 2002). Freeman (1984) further laments that adequate attention to stakeholders interest is critical to firm success, and therefore, management must pursue actions that are optimal for a general class of stakeholders, rather than serving to maximize Shareholders interest alone (Gelb and StawseR, 2001).

Therefore, recently corporations have changed their attitudes significantly by rejecting agency view and adoptingstakeholders view by integrating CSR concept in their corporate strategies (Mc Williams and Siegel, 2001). In this direction, the proponents of stakeholder view assert that CSR will lead to the improved financial performance, competative advantage, as well as long-term success (Pava and Krausz, 1996; Russio and Fouts, 1997).

Stakeholders in the context of CSR are classified into two; that is, primary and secondary stakeholders (Clackson, 1995). Wood and Jones (1995) see primary stakeholders as those groups that the corporation depends on for its survival. Primary stakeholders therefore include the stakeholders, investors, employees, customers, government and the local communities. Secondary stakeholders on the other hand, are those constituents that do not engage in any form of transactions with the firm but influence or affect the firm's operations. This form of stakeholder refers to the natural environment and could be extended to future generation (Jensen, 2002, and Capron, 2003). Considering the stakeholders as an integral part of a business is on the premise of three major roles they play within the business environment (Wood & Jones, 1995a). Stakeholders are the basis of measuring what comprise desirable and undesirable firm's performance. Secondly, they define corporate norms and social behaviour and lastly they evaluate the outcomes of firm's behaviour in respect of meeting their expectations. Therefore, Agrawal and Maneet (2011) opine that corporations must seek to meet the demands of the stakeholder's particularly social and environmental issues. It is on this ground that Frynas (2005) and Ellerman (2001) state that stakeholders should be allowed to have an active role in the firms and communities relationships in projects implementation. For instance, in Nigeria there is stakeholders consultation in most of the community development project carried out by multinational oil companies (Rowlands, 2003), however, other sectors of the economy are not seem to be taking CSR so important to this extent. In this research, stakeholder's theory is preferred.

While stakeholder's theory remains the logical framework for CSR, recently globalization of business operations led to the addition of global economy view to the stakeholders CSR framework. The view is on the notion that CSR is the consequences of transnationalization of business activities in the Globalized economic sense. As a result of this, Zadek et al., (2001) opine that CSR can best be understaood as a consequence of global business operations, due to which firms will have to take greater account of their impacts on society.

This is influence by some factors such as the changing role of government. Crane and Matten (2004) state that, in the traditional context, government was the dominant and the regulators while the companies are dependent.

However, globalization has changed this due to the shift in economic power, that is, the government now has a dependent role while the companies have the dominant role (Crane and Matten, 2004). The view is supported by the fact that globalization brought about a new economic relationship which span beyond national boundaries. As such, CSR is seen as an important tool for creating and integrating global challenges into corporate strategies and governance (Zadek, 2001 and Midttun, 2004). Following global economy view, this research subscribe to global economy view beside stakeholders view.

3.0 Research Methodology

There are two major ways of assessing market reaction to business activities, these are; individual investor's reaction and aggregate stock market reaction. This study employs the aggregate stock market reaction. This method relates share prices to specific aspect of a firm to draw conclusion about the phenomenon of interest. However, correlation research design is adopted to assess the impact of CSR activities on the market values of the listed manufacturing firms in Nigeria. The study used secondary data from the financial statements of the sampled firms for the period of six years (2008-2013).

The population of this study comprises of all the 48 firms that are into manufacturing of chemicals and other related items listed on the floor of the Nigerian Stock Exchange (NSE) Market as at 31st December, 2013. However, 19 firms succeeded as the sample size of the study based on two criteria; all the firms that were not in the NSE listing for all the period (2008 through 2013) covered by the study were filtered out; and those with difficulties in accessing their data are also dropped.

3.1 Technique of Data Analysis and Models Specification

The study employed Ordinary Least Squares (OLS) multiple regression technique of data analysis, after testing the effect of the problems of heteroskedasticity.

This is because the traditional OLS in the presence of heteroskedasticity provide spurious regression problem that can lead to statistical bias. Thus, OLS technique is considered in this paper because it is very powerful in statistical estimation, and examining the impact of one variable on another. The analysis is conducted using Statistics/Data Analysis Software (STATA 11.0).

Variables Measurement and Model Specification

Corporate social responsibility is divided into its five main areas (society activities, environmental sustainability activities, employees' relations, owners' value maximization and regulatory compliances); while on the other hand, market reaction is proxy by the market values of ordinary shares. The measurements of the variables used in this study are presented in Table 1 below;

Table 1: Variables Measurements

Variables	Measurements
Market Values	Measured by the share prices 90 days after the end of accounting period
Society CSR	Measured by total expenditures on the society in the areas of health, education and other things at the end of accounting period, as reported in the financial statements.
Environmental Sustainability	Measured by total expenditures on the environment in the areas of pollution (air, water and land) and similar environmental problems at the end of accounting period, as reported in the financial statements.
Employee CSR	Measured by total expenditures on the work force at the end of accounting period, as reported in the financial statements.
Owners' Wealth Maximization	Measured by returns on equity, net income divided by the total equity.
Regulatory Compliance	Measured by dichotomous variable, 0 if a firm was reported violating rules and regulations during an accounting period, and 1 for otherwise.
Industry Variable	Measured by dichotomous variable, 1 if a firm is among the long reputable firms in the Nigerian capital market, and 0 for otherwise.

The model of the study is mathematically expressed as follows;

$$\mathbf{MKTVAL_{it}} = \gamma_0 + \beta_1\mathbf{SOCTY_{it}} + \beta_2\mathbf{ENVRON_{it}} + \beta_3\mathbf{EMPLOY_{it}} + \beta_4\mathbf{OWNERS_{it}} + \beta_5\mathbf{RCOMPL_{it}} + \beta_6\mathbf{INDTRY_{it}} + \mu_{it} \quad \text{.....i}$$

Where

$MKTVAL_{it}$	=	market values per share of firm i in year t
$SOCTY_{it}$	=	expenditures on society activities of firm i in year t
$ENVRON_{it}$	=	expenditures on environmental sustainability of firm i in year t
$EMPLOY_{it}$	=	expenditures on employees of firm i in year t
$OWNERS_{it}$	=	owners' value maximization of firm i in year t
$RCOMPL_{it}$	=	regulatory compliances of firm i in year t
$INDTRY_{it}$	=	industry type of firm i in year t, as control variable
Intercept	=	γ_0
Estimators	=	$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ & β_6
Residual	=	μ_{it}

All the variables (society, environment and employees) are scaled by assets net book value to address the problem of size differences.

4.0 Results and Discussions

This section covers the analysis and interpretation of the data collected for the study; the section begins with the descriptive statistics and then inferential statistics of the data.

4.1 Descriptive Statistics

This section presents the description of the data collected for the study; the summary of the descriptive statistics of the data collected is presented in Table 2 as follows;

Table 2: Descriptive Statistics

Variables	Mean	SD	Min	Max	N
MKTVAL	63.1259	202.4835	1.5600	1022.00	144
LNMKTVAL	2.1828	1.5746	0.4447	6.9295	144
SOCTY	0.0384	0.0713	0.0017	0.6181	144
ENVRON	0.0214	0.0747	0.0000	0.5576	144
EMPLOY	0.3722	0.1149	0.1042	0.6104	144
OWNERS	0.0113	0.0572	-0.1599	0.2215	144
RCOMPL	0.9737	0.1608	0.0000	1.0000	144
INDTRY	0.5439	0.5003	0.0000	1.0000	144

Source: STATA OUTPUT (Appendix 1)

Table 2 shows that our measure of capital market response to social responsibility activities, market values (MKTVAL) has an average value of N63.12 with standard deviation of N202.48, and minimum value of N1.56 and N1022.00 as the maximum value. The standard deviation of 202.48 suggested that the data deviate from the mean value from both sides by N202.48, implying that there is a wide dispersion of the data from the mean because the standard deviation is higher than the mean. Although the sample firms are from different sectors, this could leads to the problem of heterogeneity in the analysis. However, the data is transformed using natural logarithm, which brought the mean value to2.1828 with standard deviation of 1.5746, and the minimum and maximum values of 0.4447 and 6.9295 respectively.

The table also shows that the average value of society (SOCTY) expenditure is 0.0384 with standard deviation of 0.0713, and minimum and maximum values of 0.0017 and 0.6181 respectively. That is, on average the sample manufacturing firms spent 3.84% of their net asset on the society during the period, while the minimum and maximum values are 0.17% and 61.81% respectively. The standard deviation of 0.0713 suggested that the data deviate from both sides of the mean value by 0.0713, implying that there is a wide dispersion of the data from the mean because the standard deviation is higher than the mean. The table on the other hand shows that the average value of environmental (ENVRON) expenditure is 0.0214 with standard deviation of 0.0747, and minimum and maximum values of 0.0000 and 0.5576 respectively. That is, on average the sample manufacturing firms spent 2.14% of their net asset on the environmental sustainability during the period, while the minimum and maximum values are 0% and 55.76% respectively.

The standard deviation of 0.0747 suggested that the data deviate from both sides of the mean value by 0.0747, implying that there is a wide dispersion of the data from the mean because the standard deviation is higher than the mean value.

The descriptive statistics from table 2 indicates that the average value of employees (EMPLOY) expenditure is 0.3722 with standard deviation of 0.1149, and minimum and maximum values of 0.1042 and 0.6104 respectively. That is, on average the sample manufacturing firms spent 37.22% of their net asset on their employees during the period, while the minimum and maximum values are 10.42% and 61.04% respectively. The standard deviation of 0.1149 suggested that the data deviate from both sides of the mean value by 11.49%, implying that there is no wide dispersion of the data from the mean value. Similarly, the table shows that the average value to the shareholders (OWNERS) is 0.0113 with standard deviation of 0.0572, and minimum and maximum values of -0.1599 and 0.2215 respectively. That is, on average the sample manufacturing firms provide a return on equity of 1.13% during the period, while the minimum and maximum returns on equities are -15.99% and 22.15% respectively. The standard deviation of 0.0572 suggested that the data deviate from both sides of the mean value by 0.0572, implying that there is a wide dispersion of the data from the mean because the standard deviation is higher than the mean value.

Similarly, table 2 shows that on average 97.37% of the sample manufacturing firms during the period comply with relevant regulations (RCOMPL), from the mean value of 0.9737 with standard deviation of 0.1608, and minimum and maximum values of 0.0000 and 1.0000 respectively. The standard deviation of 0.1608 suggested that the data deviate from both sides of the mean value by 16.08%, implying that there is no wide dispersion of the data from the mean value. Moreover, the table shows that the industry variable (INDTRY) has an average value of 0.5439 with standard deviation of 0.5003, and minimum and maximum values of 0.0000 and 1.0000 respectively. That is, on average 54.39% of the sample manufacturing firms belong to the most active sectors of the economy. The standard deviation of 0.5003 suggested that the data deviate from both sides of the mean value by 50.003%, implying that there is a wide dispersion of the data from the mean value.

Therefore, the descriptive statistics of the data collected for the variables of the study shows the nature and the extent of the dispersion of the data, which to a large extent suggested that the data did not follow the normal curve.

Therefore, the test of data normality is conducted and the results indicate that only the data from the employees and industry variables follow the normal curve (see appendix 2). Because the P-values are not significant at all levels of significance, suggesting that the null hypothesis (that, the data is normally distributed) is not rejected.

However, a further data reliability test is applied to avoid those factors that could bias our results. Hadri Langrange Multiplier (LM) test for unit root is applied to ascertain whether the data of the variables is stationary or not, the results of the tests is presented in table 3

Table 3: Unit Root Test

Variables	No. of Panels	No. of Periods	Z-Statistic	P-Values
MKTVAL	19	6	0.2297	0.4092
SOCTY	19	6	1.7668	0.0386
ENVRON	19	6	0.1101	0.4562
EMPLOY	19	6	0.6115	0.2704
OWNERS	19	6	0.3029	0.3810
RCOMPL	19	6	-1.4457	0.9259
INDTRY	19	6	-1.1919	0.8834

Source: STATA OUTPUT (Appendix 3)

Hadri LM test for panel data employs the null hypothesis that all the panels are (trend) stationery. The results from table 3 show that only SOCTY variable has unit root (that is, non-stationery) from the p-value of 0.0386. Thus, the null hypothesis that the data is stationery is rejected. On the other hand table 3 indicates all the remaining variables are stationery because the p-values are not statistically significant at all levels of significance.

Having analyzed the descriptive statistics and normality of the data, the inferential statistics of the data collected from which the hypotheses of the study are tested are presented and interpreted in the following section.

4.2 Correlation Results

In this section, the summary of the Pearson correlation Coefficients of the variables of the study are presented in Table 4 as follows

Table 4: Correlation Matrix

Variables	MKTVAL	SOCTY	ENVRON	EMPLOY	OWNERS	RCOMPL	INDTRY
MKTVAL	1.0000						
SOCTY	0.5819	1.0000					
	(0.0000)						
ENVRON	0.9300	0.3841	1.0000				
	(0.0000)	(0.0000)					
EMPLOY	0.0181	-0.2029	0.0714	1.0000			
	(0.8486)	(0.0304)	(0.4502)				
OWNERS	0.7622	0.0068	0.8123	0.1999	1.0000		
	(0.0000)	(0.9427)	(0.0000)	(0.0330)			
RCOMPL	-0.1891	-0.2167	-0.1673	0.2336	-0.0820	1.0000	
	(0.0440)	(0.0206)	(0.0752)	(0.0124)	(0.3859)		
INDTRY	-0.0375	-0.2318	-0.0476	-0.1146	0.1262	0.0625	1.0000
	(0.6923)	(0.0131)	(0.6153)	(0.2271)	(0.1809)	(0.5089)	

P-Values in Parentheses

Source: STATA OUTPUT (Appendix 4)

The results from Table 4 indicate a significant positive association between market values (MKTVAL) and society responsibility (SOCTY) from the correlation coefficient of 0.5819 which is statistically significant at 1% level of significance (p-value of 0.0000). This result implies that market significantly responded to CSR activities of the sample manufacturing firms during the period of the study. That is, CSR in terms of society is relevant to the Nigerian capital market as indicated by the significant positive relationship in this study. Similarly, the results from the Table indicate a strong significant positive association between market values (MKTVAL) and environmental sustainability (ENVRON) from the correlation coefficient of 0.9300 which is statistically significant at 1% level of significance (p-value of 0.0000). This result also implies that market significantly responded to CSR activities of the sample manufacturing firms during the period of the study. That is, CSR in terms of environmental responsibility is relevant to the Nigerian capital market as indicated by the significant positive relationship in this study.

Table 4 indicates a positive association between market values (MKTVAL) and employees' expenditures (EMPLOY) from the correlation coefficient of 0.0181 which is not statistically significant at all levels of significance (p-value of 0.8486).

This result implies that market does not significantly respond to CSR activities of the sample manufacturing firms during the period of the study, in terms of employees' responsibility. That is, CSR in terms of employee is not relevant to the Nigerian capital market as indicated by the insignificant relationship in this study. However, the results from the Table indicate a strong significant positive association between market values (MKTVAL) and shareholders' value (OWNERS) from the correlation coefficient of 0.7622 which is statistically significant at 1% level of significance (p-value of 0.0000). This implies that market significantly responded to CSR activities of the sample manufacturing firms during the period of the study, in terms of owners' wealth maximization. That is, CSR in terms of generating value to owners of the business is relevant to the Nigerian capital market as indicated by the significant positive relationship in this study. On the contrary, the results from the Table indicate a significant negative association between market values (MKTVAL) and regulatory compliances (RCOMPL) from the correlation coefficient of -0.1891 which is statistically significant at 5% level of significance (p-value of 0.0440). This implies that investors restrained when there is high regulation and this could affect market values negatively. Lastly, the result shows a lack of significant association between market values (MKTVAL) and the type of industry (INDTRY) from the correlation coefficient of -0.0375 which is not statistically significant at all levels of significance (p-value of 0.6923). This implies that the market does not consider industry in the valuation of firms. Following the analysis of the relationships among the variables of the study, the regression results from which the hypotheses of the study are tested are presented and analyzed in the following section.

4.3 Regression Results of the Model

This section presents and analyzes the regression results of the model as presented in table 5 below;

Table 5: Summary of OLS Regression Results of the Model

Variables	Statistics	P-Values
R^2	0.9581	
Adjusted R^2	0.9558	
F-Statistic	408.06	0.0000
Hettest: Chi2	2.66	0.1027
Mean VIF	2.52	
Random Effect Test: Chibar2	0.62	0.2157

Source: STATA OUTPUT (Appendix 5, 6, 7, & 9)

This study adopts Panel data which does not usually meet all the classical assumptions of OLS, as such the study subjected the model to some robustness tests. The results in table 5 show an absence of Heteroskedasticity in the panel as indicated by the Breuch Pagan/Cook-Weisberg test for heteroskedasticity Chi2 of 2.66 with p-value of 0.1027. That is, the null hypothesis that the variance of the residuals is constant (homocedastic) is not rejected. Homocedasticity is an OLS assumption that usually leads to Best Linear Unbiased Estimators (BLUE). Moreover, the table indicates the absence of the perfect multicolinearity among the explanatory variables, as shown by the mean Variance Inflation Factor (VIF) of 2.52. The decision criterion for the VIF is that a value of 10 and above implies the presence of perfect collinearity. On the other hand, the table shows from the result of random effect test, Breusch and Pagan Lagrangian Multiplier Test for Random Effects, that there is no statistical significant variance among the units in the panel (Chibar2 of 0.62 with p-value of 0.2157), implying that OLS technique is the most appropriate for the study.

Table 5 indicate that the explanatory variables of the study explained 95.58% of the total variations in the dependent variable (market values) of the sample manufacturing firms during the period of the study, from the adjusted coefficient of determinations (adjusted R^2 of 0.9558). Similarly, the table shows that the model is fit from the F-Statistic of 408.06 which is significant at 1% level of significance (P-value of 0.0000). Following the fitness of the model, test of hypotheses formulated in this study is conducted in the following section.

4.4 Hypotheses Testing

The study tests the hypotheses formulated for the study, Table 4.7 presents the coefficients of the variables of the study from which the hypotheses are tested.

Table 6: OLS Estimators

Variables	Coefficients	t-values	P-Values
SOCTY	0.5879	15.24	0.000
ENVRON	0.6692	10.63	0.000
EMPLOY	-0.0057	-0.29	0.771
OWNERS	0.3964	8.63	0.000
RCOMPL	0.0044	0.39	0.695
INDTRY	0.0068	1.46	0.146
CONSTANT	0.0049	0.55	0.584

Source: STATA OUTPUT (Appendix 5)

The results from table 6 show that CSR on society (SOCTY) has a significant statistical positive impact on the market values of listed manufacturing firms in Nigeria, from the coefficient of 0.5879 with t-value of 15.24 which is statistically significant at 1% level (p-value of 0.000). This suggests that, a N1 increase in CSR on society, market value increases by 58.79k, this implies that CSR on society is valued by the market. Based on this, the study rejects the null hypothesis one (H_{01}) which states that Corporate Social Responsibility on Society has no significant impact on the market values of listed manufacturing firms in Nigeria. The study therefore infers that market response positively to the CSR on society in Nigeria. Table 6 also shows that CSR on environmental sustainability (ENVRON) has a significant statistical positive impact on the market values of listed manufacturing firms in Nigeria, from the coefficient of 0.6692 with t-value of 10.63 which is statistically significant at 1% level (p-value of 0.000). This suggests that, a N1 increase in CSR on environmental sustainability, market value increases by 66.92k, this implies that CSR on environmental sustainability is value relevant to the market. Based on this, the study rejects the null hypothesis two (H_{02}) which states that Corporate Social Responsibility on environmental sustainability has no significant impact on the market values of listed manufacturing firms in Nigeria. The study infers that market response positively to the CSR on environmental sustainability in Nigeria during the period covered by the study.

Moreover, table 6 indicates that CSR on employees (EMPLOY) has a negative impact on the market values of listed manufacturing firms in Nigeria, from the coefficient of -0.0057 with t-value of -0.29 which is not statistically significant at all levels of significance (p-value of 0.771). This suggests that, a N1 increase in CSR on employees, market value decreases by 00.57k, but is not statistically significant. Based on this, the study failed to reject the null hypothesis three (H_{03}) which states that Corporate Social Responsibility on employees has no significant impact on the market values of listed manufacturing firms in Nigeria. The study therefore infers that market did not significantly response to the CSR on the employees in Nigeria during the period under review. Similarly, the Table shows that CSR on value maximization (OWNERS) has a significant statistical positive impact on the market values of listed manufacturing firms in Nigeria, from the coefficient of 0.3964 with t-value of 8.63 which is statistically significant at 1% level (p-value of 0.000). This suggests that, a N1 increase in CSR on owners' value maximization, market value increases by 39.64k, this implies that CSR on owners' value maximization is value relevant to the market.

Based on this, the study rejects the null hypothesis four (H_{04}) which states that Corporate Social Responsibility on owners' value maximization has no significant impact on the market values of listed manufacturing firms in Nigeria. The study infers that market response positively to the CSR on owners' value maximization in Nigeria during the period covered by the study.

Table 6 also indicates that CSR in terms of regulatory compliances (RCOMPL) has a positive impact on the market values of listed manufacturing firms in Nigeria, from the coefficient of 0.0044 with t-value of 0.39 which is not statistically significant at all levels of significance (p-value of 0.695). This implies that market did not significantly response to regulatory compliances. Based on this, the study failed to reject the null hypothesis five (H_{05}) which states that compliance with regulations has no significant impact on the market values of listed manufacturing firms in Nigeria. The study therefore infers that market did not significantly response to the CSR in terms of regulatory compliances in Nigeria during the period under review. Similarly, the Table shows that industry has a positive impact on the market values of listed manufacturing firms in Nigeria, from the coefficient of 0.0068 with t-value of 1.46 which is not statistically significant at all levels of significance (p-value of 0.146).

These findings implied that there are social investors in the Nigerian capital market who value social responsibility activities. The implication here is that, if manufacturing companies would continue to invest in social responsibility especially in the areas of society and environmental sustainability and wealth maximization, their market values could improved significantly.

5.0 Conclusion and Recommendation

This paper examined the how market response to the corporate social responsibility activities of listed manufacturing firms in Nigeria. From the results, the study concludes that corporate social responsibility in Nigeria is relevant and informative to investors. Especially, the study concludes that corporate social responsibility on society; environmental sustainability and owners' wealth maximization have significantly impacted on the market values of listed manufacturing firms at 99% confidence level during the period covered by the study. The study however did not find evidence that corporate social responsibility on employees and regulatory compliances have any significant relationship with market values during the period under review.

The paper recommends that manufacturing companies in Nigeria should double their efforts towards corporate social responsibility in Nigeria. This could send a positive message to the market and enhance their value in return; it will also help create conducive atmosphere for conducting business.

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Appendices

```
. xtset id year, yearly
       panel variable:  id (strongly balanced)
        time variable:  year, 2008 to 2013
                delta:  1 year
```

1. Descriptive Statistics

```
. xtsum mktval lnmktval socty envron employ owners rcompl indtry
```

Variable		Mean	Std. Dev.	Min	Max	Observations
mktval	overall	63.12596	202.4835	1.56	1022	N = 114
	between		203.7857	2.153333	892.6667	n = 19
	within		36.17303	-262.5407	192.4593	T = 6
lnmktval	overall	2.182804	1.574583	.4446858	6.929517	N = 114
	between		1.580123	.7488088	6.775751	n = 19
	within		.3049632	1.305163	2.939125	T = 6
socty	overall	.0383526	.0713087	.0017	.6181	N = 114
	between		.0339152	.0114833	.1446	n = 19
	within		.0631315	-.0995474	.5118526	T = 6
envron	overall	.0214211	.0746538	0	.5576	N = 114
	between		.0310255	.0007333	.1061667	n = 19
	within		.0682144	-.0847456	.4728544	T = 6
employ	overall	.3722096	.114957	.1042	.6104	N = 114
	between		.0719339	.2676	.5188667	n = 19
	within		.0909373	.1271597	.5424096	T = 6
owners	overall	.011293	.0572126	-.1599	.2215	N = 114
	between		.0324749	-.0398833	.0626333	n = 19
	within		.0475954	-.1478737	.1893763	T = 6
rcompl	overall	.9736842	.1607794	0	1	N = 114
	between		.0624391	.8333333	1	n = 19
	within		.148741	.1403509	1.140351	T = 6
indtry	overall	.5438596	.5002716	0	1	N = 114
	between		.3678521	0	1	n = 19
	within		.34777	-.2894737	1.377193	T = 6

```
.
```

2. Normality Test

```
. swilk mktval socty envron employ owners rcompl indtry

                    Shapiro-Wilk W test for normal data

    Variable |     Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
      mktval |     114    0.37718     57.394     9.048    0.00000
       socty |     114    0.44073     51.537     8.808    0.00000
      envron |     114    0.29257     65.191     9.333    0.00000
      employ |     114    0.98628      1.264     0.524    0.30018
      owners |     114    0.54089     42.308     8.367    0.00000
      rcompl |     114    0.51841     44.379     8.474    0.00000
      indtry |     114    0.99296      0.649    -0.967    0.83335
```

3. Unit Root Test

```
. xtunitroot hadri mktval

Hadri LM test for mktval
------------------------

Ho: All panels are stationary               Number of panels  =     19
Ha: Some panels contain unit roots          Number of periods =      6

Time trend:         Not included            Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust                                 sequentially
LR variance:        (not used)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     0.2297        0.4092
------------------------------------------------------------------------------

. xtunitroot hadri socty

Hadri LM test for socty
-----------------------

Ho: All panels are stationary               Number of panels  =     19
Ha: Some panels contain unit roots          Number of periods =      6

Time trend:         Not included            Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust                                 sequentially
LR variance:        (not used)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     1.7668        0.0386
------------------------------------------------------------------------------
```

```
. xtunitroot hadri envron

Hadri LM test for envron
------------------------------

Ho: All panels are stationary                Number of panels  =     19
Ha: Some panels contain unit roots           Number of periods =      6

Time trend:         Not included             Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust                                sequentially
LR variance:        (not used)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    0.1101        0.4562
------------------------------------------------------------------------------
. xtunitroot hadri employ

Hadri LM test for employ
------------------------------

Ho: All panels are stationary                Number of panels  =     19
Ha: Some panels contain unit roots           Number of periods =      6

Time trend:         Not included             Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust                                sequentially
LR variance:        (not used)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    0.6115        0.2704
------------------------------------------------------------------------------

. xtunitroot hadri owners

Hadri LM test for owners
------------------------------

Ho: All panels are stationary                Number of panels  =     19
Ha: Some panels contain unit roots           Number of periods =      6

Time trend:         Not included             Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust                                sequentially
LR variance:        (not used)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    0.3029        0.3810
------------------------------------------------------------------------------

. xtunitroot hadri rcompl

Hadri LM test for rcompl
------------------------------

Ho: All panels are stationary                Number of panels  =     19
Ha: Some panels contain unit roots           Number of periods =      6

Time trend:         Not included             Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust                                sequentially
LR variance:        (not used)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                   -1.4457        0.9259
------------------------------------------------------------------------------
```

```
. xtunitroot hadri indtry

Hadri LM test for indtry
------------------------------

Ho: All panels are stationary                Number of panels  =     19
Ha: Some panels contain unit roots           Number of periods =      6

Time trend:         Not included             Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust                                sequentially
LR variance:        (not used)
```

	Statistic	p-value
z	-1.1919	0.8834

4. Correlation Results

```
. pwcorr mktval socty envron employ owners rcompl indtry, star (0.05) sig
```

	mktval	socty	envron	employ	owners	rcompl	indtry
mktval	1.0000						
socty	0.5819* 0.0000	1.0000					
envron	0.9300* 0.0000	0.3841* 0.0000	1.0000				
employ	0.0181 0.8486	-0.2029* 0.0304	0.0714 0.4502	1.0000			
owners	0.7622* 0.0000	0.0068 0.9427	0.8123* 0.0000	0.1999* 0.0330	1.0000		
rcompl	-0.1891* 0.0440	-0.2167* 0.0206	-0.1673 0.0752	0.2336* 0.0124	-0.0820 0.3859	1.0000	
indtry	-0.0375 0.6923	-0.2318* 0.0131	-0.0476 0.6153	-0.1140 0.2271	0.1262 0.1809	0.0625 0.5089	1.0000

.

5. OLS Regression Results

```
. reg mktval socty envron employ owners rcompl indtry
```

Source	SS	df	MS
Model	1.17306062	6	.195510103
Residual	.051265609	107	.000479118
Total	1.22432623	113	.010834745

```
Number of obs =     114
F(  6,   107) =  408.06
Prob > F      =  0.0000
R-squared     =  0.9581
Adj R-squared =  0.9558
Root MSE      =  .02189
```

mktval	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
socty	.5879495	.0388223	15.14	0.000	.5109888	.6649103
envron	.6692368	.0629846	10.63	0.000	.5443771	.7940965
employ	-.0057346	.0196439	-0.29	0.771	-.0446763	.033207
owners	.3963743	.0459057	8.63	0.000	.3053715	.487377
rcompl	.0043523	.0110762	0.39	0.695	-.017605	.0263097
indtry	.0067517	.0046141	1.46	0.146	-.0023953	.0158986
_cons	.0048732	.0088805	0.55	0.584	-.0127314	.0224779

6. Heteroscedasticity Test

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of mktval

         chi2(1)      =     2.66
         Prob > chi2  =   0.1027
```

7. Colinearity Test

```
. vif
```

Variable	VIF	1/VIF
envron	5.21	0.191774
owners	4.63	0.215907
socty	1.81	0.553243
employ	1.20	0.831454
indtry	1.15	0.866724
rcompl	1.12	0.895125
Mean VIF	2.52	

8. Random Effect Regression

```
. xtreg mktval socty envron employ owners rcompl indtry, re

Random-effects GLS regression                   Number of obs      =       114
Group variable: id                              Number of groups   =        19

R-sq:  within  = 0.9604                         Obs per group: min =         6
       between = 0.9471                                        avg =       6.0
       overall = 0.9580                                        max =         6

                                                Wald chi2(6)       =   2488.90
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

mktval	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
socty	.5909377	.0394092	14.99	0.000	.5136971	.6681783
envron	.6729865	.0632906	10.63	0.000	.5489392	.7970339
employ	.0004005	.0204089	0.02	0.984	-.0396003	.0404012
owners	.3938812	.046111	8.54	0.000	.3035053	.4842572
rcompl	.005946	.0111269	0.53	0.593	-.0158623	.0277543
indtry	.0057575	.0047681	1.21	0.227	-.0035878	.0151027
_cons	.0029803	.0091341	0.33	0.744	-.0149222	.0208828
sigma_u	.00635296					
sigma_e	.02102415					
rho	.0836695	(fraction of variance due to u_i)				

```
. est store random
```

9. Random Effect Test

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        mktval[id,t] = Xb + u[id] + e[id,t]

        Estimated results:
                     |        Var     sd = sqrt(Var)
             ---------+-----------------------------
              mktval |    .0108347       .1040901
                   e |     .000442       .0210242
                   u |    .0000404        .006353

        Test:   Var(u) = 0
                             chibar2(01) =     0.62
                          Prob > chibar2 =   0.2157
```