NIGERIAN JOURNAL OF ACCOUNTING RESEARCH

A Publication of The Department of Accounting, Ahmadu Bello University, Zaria-Nigeria

Vol. 12, Number 2, December, 2016

https://njar.org.ng/

BOARD CHARACTERISTICS, OWNERSHIP STRUCTURE AND FIRM VALUE OF LISTED PETROLEUM COMPANIES IN NIGERIA

Samaila Thompson
Department of Accounting, Ahmadu Bello University Zaria, Nigeria

Ahmad Bello Dogarawa
Department of Accounting, Ahmadu Bello University Zaria, Nigeria

Ahmed Bello
College of Accountancy, Universiti Utara, Malaysia

Musa Inuwa Fodio
Department of Accounting, Nasarawa State University, Keffi

Abstract

Corporate governance is increasingly becoming a topical issue in Nigeria especially given the number of events that led to reforms meant to strengthen sound firm practices in the country. The events which include growth and decline in the equity market, expansion in the number of shareholders and a variety of corporate scandals have continued to raise the concern of policy makers, investors, analysts and academics on corporate governance practices of corporations and how these practices affect firm value. This paper examined the effect of board characteristics and ownership structure on firm value of listed petroleum companies in Nigeria. The study used six (6) listed petroleum firms that had consistently published their annual audited financial reports from 2008 to 2015, and analyzed the data based on robust pooled-OLS multiple regression result due to absence of panel effect in the dataset as confirmed by the result of Breusch Pagan Lagrangian Multiplier test. The results revealed that board size, board independence as well as managerial shareholding had significant negative effect on firm value. In the case of board gender diversity, it was discovered that the inclusion of females on the board of petroleum firms in Nigeria had a

significant positive effect on firm value. The study concluded that overall, board characteristics and ownership structure components of board size, board independence, board gender diversity, ownership concentration and managerial shareholding affect the value of listed petroleum firms in Nigeria, though the direction and extent of the association vary from one component to the other. In view of the findings, the study recommended an optimal board size of between five (5) and sixteen (16) directors, beyond which an additional board member will create added costs greater than the benefit derivable from the added board member. Also, females should be elected to boards based on their skills, education, expertise and experience. In addition, concentrated shareholding should be encouraged at lower levels, while a large managerial ownership structure should be moderated to create a strong incentive to reduce the abuse of shareholders resources.

Keywords: *Board characteristics, firm value, Nigeria, ownership structure, petroleum firms*

1. Introduction

The predominant role of corporate governance of firms as encapsulated in the accounting and finance literature is reflected in the agency view of conflict of interest between owner and manager. The view asserts that while shareholders are concerned about maximizing returns at reasonable risk, managers may prefer growth to profits, may be lazy or fraudulent, and may maintain costly labor or product standards above the necessary competitive minimum. Given the potential conflict of interest as a result of separation of ownership and control (Berle & Means, 1932), various corporate governance components are needed to align the interests of principals and agents (Jensen & Meckling, 1976; Fama, 1980; Fama & Jensen, 1983). The alignment of the interests is meant to improve the performance of firms, enhance investor trust, attract outside investments, and demonstrate a commitment to observe international standards.

Theoretically, Black (2001), Gompers, Ishii and Metrick (2003), Gillan (2006) and Bauer, Frijns, Otten and Tourani-Rad (2008) have argued that the quality of governance components in the form of an efficient board of directors and appropriate ownership structure in a firm can positively affect the firm value. In view of this, Black (2001) concluded that quality corporate governance components should have significant effect on the value of firms especially in countries with weak laws and weak governance behaviour. Empirically, Gompers, Ishii and Metrick (2003) showed that there is a positive relationship between governance index and corporate performance in the long-term while Gillan (2006)

found that a firm's rating has positive effect on firm value and returns to shareholders.

Berghe and Ridder (1999) stated that poor governance culture leads to poor firm performance. This statement suggests that the effectiveness of the implementation of firm governance should be desirable to management and other stakeholders of a firm because the implementation of good corporate governance may fail if firms in the same environment differ in the implementation quality of its governance components (Silveira, Leal, Silva & Barros, 2007). Accordingly, Heinrich (2002) and Ahunwan (2003) clearly identified economic, market behavior, regulatory framework and social differences, in addition to the nature, direction, processes and magnitude of activities that affect the operations of firms. Studies on corporate governance have used some of the above parameters and indexes including Black (2001) for Russia; Gompers, Ishii and Metrick (2003) for the US; Drobetz, Schillhofer and Zimmermann (2004) for Germany; Klapper and Love (2004) for emerging markets; Grzybkowski and Wojcik (2006) for OECD, Black, Jang and Kim (2006) for Korea, and Bauer, Frijns, Otten and Tourani-Rad (2008) for Japan.

Several empirical literature studying the link between corporate governance components and firm value have concentrated on particular aspects of governance, such as board composition, executive compensation, investor protection, shareholder activism and antitakeover provision. For example, Millstein and MacAvoy (1998) and Bhagat and Black (1999) investigated the relationship between board characteristics and firm performance. Karpoff, Marr and Danielson (2000) and Chua, Eun and Lai (2007) linked firm performance with shareholder activism. Bhagat, Carey and Elson (1999) looked at the relationship between outside director pay and firm performance. Gompers, Ishii and Metrick (2003) linked firm performance to a corporate governance index based largely on takeover defenses. Some other studies such as Klapper and Love (2002), Black, Jang and Kim (2006), Chong and Lopez-de-Silanes (2006), Black and Khanna (2007) and Black, Gledson-de-Carvalho and Gorga (2012) examined monitoring mechanisms and transparency standards across firms. It is observed that in addition to being foreign-based, the studies did not capture the interwoven connection between the various components of corporate governance.

In Nigeria, corporate governance has become an important policy concern especially given a number of events that have raised the profile of corporate governance reforms. These events include the growth and decline in the Nigerian equity market, and the expansion in the number of shareholders, together with a variety of corporate scandals (ROSC, 2008). In a survey of disclosure practices

commissioned by the World Bank (WB) and the International Finance Centre (IFC), the survey suggested a relatively high compliance with several governance principles, but in practice certain problems remained. Among these are a number of governance practices that affect board performance, problems with the execution of certain shareholders rights, the disclosure of ownership of listed firms on the NSE, problematic implementation of firm audit committee, together with a relatively weak enforcement of some aspects of the corporate governance framework (ROSC, 2008).

In view of the nexus that has been theoretically established between good corporate governance and firm performance, it is argued that a sound corporate governance practice is particularly desirable for the Nigerian petroleum industry. The argument is predicated upon the fact that the Securities and Exchange Commission (SEC) Code of Corporate Governance 2003 reviewed in 2008 for firms listed on the Nigerian Stock Exchange (NSE) has identified weak corporate governance as a constraint to good corporate governance practices. Considering that the operations are volatile and riskier than many other types of firms, and the characteristics of its assets and liabilities are more opaque, leading to an asymmetry of information, less transparency and a greater ability to obscure existing and developing problems, good corporate governance practice is important to the country's petroleum industry.

The sensitivity of Nigeria's petroleum resources is clearly reflected in its importance to the Nigerian economy because it is the major foreign exchange earner, contributing over 80% of government revenues and providing for the development of Nigeria's infrastructures and other industries (Anya, 2002; Chukwu, 2002; Mathiason, 2006). According to the British Petroleum (BP) Statistical Energy Survey, Nigeria as a leading oil and gas producer in Africa currently ranks as the tenth largest oil producer in the world with proved oil reserves of about 37.2 billion barrels and estimates in excess of 187.5 trillion standard cubic feet of natural gas at the end of 2011 (Mbendi, 2014). The foregoing underscores the vast investments potentials of the Nigerian petroleum industry, hence, investment decisions in the industry is likely to be influenced by firm value, which is the firms' economic performance, and financial accounting information reported in annual financial statements which contains various variables and measures that indicates performance. These variables and measures serve as yardsticks for the assessment of firms in the Nigerian petroleum industry by various stakeholders (Lehmann & Weigand, 2000). The indicators as observed by Brennan and Schwartz (1985), Breuer (1999) and Xie, Davidson and DaDalt (2003) relative to some pre-established benchmarks, rules, and mechanisms influence the integrity of the financial statements as the primary source of

information that captures firm value and ensures protection for shareholders, investors and suppliers.

Studies in Nigeria on corporate governance seemed to have taken the pattern of component-specifics. For instance, Sanda, Garba and Mikailu (2008) focused on only board independence, Adams (2010) studied board of directors, Babatunde and Olaniran (2009) covered audit committee and audit size, Tsegba and Ezi-Herbert (2011) used ownership structure, and Garba and Abubakar (2014) concentrated on board diversity. Since the various components of corporate governance serve different purposes the combined effect of which guarantee protection of the interests of stakeholders, a study that ignore other governance components not on ground of industry peculiarity will undoubtedly suffer scope limitation. Though Idornigie (2010) and Ajala, Amuda and Arulogun (2012) covered some aspects of both board characteristics and ownership structure, their studies focused on the over flogged banking industry at the expense of more strategic sectors such as the petroleum industry.

It has been observed that the activities of petroleum industry in Nigeria is associated with a lot of volatilities that include crude oil theft, oil bunkering, pipe-line vandalism and a high rate of kidnapping of oil-workers. These volatilities, which are sometimes fueled by poor corporate governance practice greatly affect the operations of the industry's players in a number of ways and in turn affect their firm value. Given that poor governance culture will lead to poor firm value, the need to understand corporate governance practices is even more desirous for the petroleum industry. The dearth of corporate governance studies on petroleum sector using Nigerian data underscores the need for an effort to conduct a study that will fill the gap identified in the literature using appropriately selected governance components. This study therefore investigates the effect of board characteristics and ownership structure on firm value of listed petroleum companies in Nigeria. Specifically and based on the peculiarity of the sector, the study examines the effect of board size, board independence, board gender diversity, ownership concentration and managerial shareholding on firm value of listed petroleum companies in Nigeria. It tests the hypotheses that board size, board independence, board gender diversity, ownership concentration and managerial shareholding have no significant effect on firm value of listed petroleum companies in Nigeria.

The study covers the period from 2008 to 2015. The choice of this period is considered appropriate because the SEC code of corporate governance was reviewed in 2008. The period therefore offered a sound basis for investigation of the effect of the selected variables on the value of the firms as per the reviewed

code of corporate governance. In addition, the period witnessed the fall-out of the global financial crisis that led to the collapse of some major corporations of which governance malpractice was identified as one of the major causes of the collapse. The paper makes an original contribution to the literature in view of the fact that it represents the first investigation into the effect of appropriate and carefully selected corporate governance components on firm value of listed firms in the Nigerian petroleum industry, especially after the 2008 review of the code of corporate governance of 2003.

The paper consists of six sections. Section 2 conceptualises the main issues covered by the paper and discusses the theoretical link between them. Section 3 reviews relevant empirical studies on the relationship between the explanatory and outcome variables. Section 4 discusses the design and methodology of the paper. Section 5 analyses and interprets regression results and discusses findings in light of previous studies. Section 6 concludes the paper and offers recommendations.

2. Theoretical Considerations

The term value refers to the utility or the benefit that can be derived from a good or an object (Wild, 1992). In finance, it refers to the price for which a good or object can be exchanged. Firm value is derived from the market's expectations of firm performance, and accounting measures provide the necessary information for the market to form these expectations. Thus, the book value of equity represents past performance and current earnings are indicative of future performance. Therefore, these measures are commonly used as the basis for firm valuation (Penman, 1980; Easton & Harris, 1991; Wild, 1992; Ohlson, 1995).

Though there are different concepts for the value of a firm such as intrinsic value, social value and hedonic value, the common factor in all value relevance studies is that an accounting number is deemed value relevant if it has a significant association with equity market value (Barth, Beaver & Landsman, 2001). Value relevance literature suggests that shareholders use accounting earnings to estimate future returns (Lev, 1988; Barth, Beaver & Landsman, 1996; Choi, Collins & Johnson, 1997; Kallunki & Martikainen, 1997; Beaver, 1998). However, value relevance studies use equity market value as the valuation benchmark to assess how well particular accounting measures reflect information used by investors (Barth, Beaver & Landsman, 2001).

Bishop, Faff, Oliver and Twite (2004) and Bose (2004) have suggested Tobin's Q amongst a variety of methods widely used for firm valuation. Tobin's Q as defined by Bhagat and Jefferis (2002), Gompers, Ishii and Metric (2003) and

Beiner and Schmid (2005) is the ratio of market value of assets (equity and debt) to the replacement value of assets. According to Sarkar and Sarkar (2000), debt as an important component in the Tobin's Q can be accurately valued. As such, Tobin's Q is widely used in studies on corporate governance and firm value relationship (Agrawal & Knoeber, 1996; Loderer & Peyer, 2002; Beiner & Schmid, 2005). A value of Tobin's Q greater than one shows that a firm had created value for its shareholders; on the contrary, a value of the variable lower than one shows that the firm had not performed creditably.

Different researchers in literature calculate the proxy for Tobin's Q in different ways. Capulongrd, Edwards, Webb and Zhuang (2000) used the ratio between market value of equity and debt to the replacement cost of assets as the proxy for Tobin's Q. On the contrary, Klapper and Love (2004) calculated Tobin's Q by taking the ratio of market value of equity and total assets of a firm. Similarly, Gompers, Ishii and Metric (2003) used the proxy for Tobin's Q as a ratio between market value of assets to the book value of assets-the market value of assets was thus calculated by adding the market value of equity and book value of debt.

The literature has documented a number of corporate governance components that affect the value of firms. The components, which are broadly classified into board characteristics and ownership structure consist of board attributes such as size, independence, composition, committees and diversity on one hand, and on other hand different types of ownership interest in a firm that include foreign, institutional, block, managerial and concentrated. Boards are by definition the internal governing mechanism that shapes firm governance given their direct access to the two other axes in the corporate governance triangle which are managers and shareholders. Ownership structure refers to the different types and classes of ownership interest that holders of stocks have in a firm. The theoretical link between the components of board characteristics and ownership on one hand and on other hand firm value are is briefly discussed hereunder.

2.1 Board Size and Firm Value

Board size refers to the total number of directors on the board. As a widely used variable in the literature of firm governance, its value is found by counting the number of directors on the board of a firm, inclusive of the CEO and Chairman, outside directors, executive directors and non-executive directors for each accounting year (Pfeffer, 1972; Chaganti, Mahajan & Sharma, 1985). Board size plays an important role in corporate monitoring, as such Jensen (1976), Yermack (1996), Eisenberg, Sundgren and Wells (1998) and Mallin (2002) argued that as board size increases it becomes less efficient due to slower decision making. Other studies such as Spong and Sullivan (2007) and Coles, Daniel and Naveen

(2008) contended that size is not related to firm value by arguing that size is dependent on each individual firm's need of advising or monitoring, size, and age. However, Jensen (1993) argued that the preference for smaller board size stems from technological and organizational change which ultimately leads to cost cutting and downsizing. Hermalin and Weisbach (2003) argued the possibility that larger boards can be less effective than small boards. When boards consist of too many members' agency problems may increase, as some directors may tag along. Lipton and Lorch (1992) therefore recommended limiting the number of directors on a board to seven or eight, as numbers beyond that they argued would be difficult for the CEO to control. A large board could also result in less meaningful discussion, since expressing opinions within a large group is generally time consuming and difficult and frequently results in a lack of cohesiveness on the board (Lipton & Lorch, 1992). In addition, the problem of coordination outweighs the advantages of having more directors (Jensen, 1993) and when a board becomes too big, it often moves into a more symbolic role, rather than fulfilling its intended function as part of the management (Hermalin & Weisback, 2003). On other hand, very small boards lack the advantage of having the spread of expert advice and opinion that is found in larger boards.

Furthermore, larger boards are more likely to be associated with an increase in board diversity in terms of experience, skills, gender and nationality (Dalton & Dalton, 2005). Expropriation of wealth by the CEO or inside directors is relatively easier with smaller boards since small boards are also associated with a smaller number of outside directors. The few directors in a small board are preoccupied with the decision making process, leaving less time for monitoring activities. Fama and Jensen (1983) believed that as board size increases, decision-making becomes slower and with free-riding problems it becomes less efficient leading to lower firm value. In support of this argument, Yermack (1998), Eisenberg, Sundgren and Wells (1998) and Mallin (2002) provided evidence that smaller boards are related to higher firm value. On the other hand Coles, Daniel and Naveen (2008) provided evidence that both very large and very small board sizes affect firm value. They believed that this happens due to business complexities. In support of Coles, Daniel and Naveen (2008), Raheja (2005) earlier suggested that there is no optimal board size, since board size tends to depend on either advising or monitoring needs and this changes from firm to firm.

2.2 Board Independence and Firm Value

Several studies on the role and effectiveness of boards of directors have emphasized the potential importance of board independence (Raheja, 2005; Adams & Ferreira, 2007; Boone, Field, Karpoff & Raheja, 2007; Coles, Daniel & Naveen, 2008). One stream of research had focused on independent director

representation on the board and concluded that the nature of a firm's investment opportunities affects its demand for outside directors with particular attributes to enhance a board's advisory and monitoring roles. Another stream of research emphasizes private benefits of control and CEO influence over board nominations to explain the degree of board independence.

Existing evidence finds a nontrivial impact of distance in a variety of situations where monitoring has substantial value. Manas and Saravanan (2006) argued that proximity affects its willingness to invest in a firm or join a firm's board since it is generally less costly to oversee local firms than more distant ones. Peasnell, Pope and Young (2006) found that foreign independent directors, who are far removed from a firm, are less likely to attend board meetings and boards that include them are more likely to offer excessive CEO compensation and restate earnings as a result of financial misreporting and exhibit significantly poorer firm performance. Outside directors with executive experience are crucial to shareholder wealth creation (Fich & Lawrence, 2005) and executives of other local firms comprise a significant proportion of independent directors and of the local pool of prospective directors. Corporate boards require more than general managerial experience from their independent directors; they also require individuals with specialized knowledge and skills to advise the board and CEO (Linck, Netter & Yang, 2008).

A number of prior studies showed that greater representation of outside directors on boards lead to gains in shareholder wealth (Brickley, Coles & Terry, 1994; Beasley, 1996; Yermack, 1996; Rosenstein & Wyatt, 1997; Dedman, 2000; Gompers, Ishii & Metrick, 2003; Gul & Leung, 2004; Gupta, Otley & Young, 2008). However, many researchers have raised concerns about endogeneity of board composition and the challenges in attributing causation to the observed board independence-firm performance relation (Bhagat & Black, 2002; Boone, Field, Karpoff & Raheja, 2007; Coles, Daniel & Naveen, 2008). There are strong perceptions therefore that the existence of independent directors lead to increased good governance (Fernandez-Rodriguez, Gomez-Anson & Cuervo-Garcia, 2004). The high expectations of the role of the non-executive board members are interesting since the existing empirical studies have shown mixed results regarding the relationship between firm value and board independence (Dalton, Daily, Ellstrand & Johnson, 1998; Weisbach & Hermalin, 2003; Dulewicz & Herbert, 2004; Peng, 2004). Furthermore, some scholars had argued that a supermajority of independent directors will lead to worse performance (Bhagat & Black, 1999). Similarly, Hillman, Cannella and Paetzold (2000) discussed how in governance research there is a need to look at skills distinct from monitoring.

Studies on the monitoring function of boards have generally shown a preference for boards dominated by independent, outside directors (Baysinger & Butler, 1985; Weisbach, 1988; Daily, 1995; Barnhart, Marr & Rosenstein, 2006). They had argued that boards consisting primarily of insiders who could include current or former managers and employees of the firm or those outsiders who are not independent of current management or the firm because of business dealings, family or social relationships have less incentive to monitor management, owing to their dependence on the firm. Boards dominated by outside, nonaffiliated directors, however are thought to be better monitors because they lack this disincentive to monitor. Despite numerous empirical tests, however, this hypothesis has yet to be unequivocally supported.

2.3 Board Diversity and Firm Value

Diversity on the board is clearly well encouraged in corporate governance literature. Such diversity as is often advocated includes; combination of executives, independent and non-executive directors, diversity of experience, expertise and skill (Rhodes & Peckel, 2010). Other areas of diversity often ignored include; social diversity, racial diversity and gender diversity. Board gender diversity is becoming a strategic issue as some institutional investors are beginning to see gender diversity as a crucial criterion of the investment policy (Carter, Simikins & Simpson, 2003). Some research studies have shown that board gender diversity falls within the scope of the business case of diversity which was introduced by Cos and Blake (1991) and Dang, Nguyen and Vo (2012).

It is believed that good corporate governance is positively associated with board diversity (Carter, Simkins & Simpson, 2003). With well-managed diversity on board of directors, it enhances the firm performance in terms of decision-making process and corporate image with equality (Rhode & Packel, 2010). Milliken and Martins (1996) summarized the types of diversity into observable and non-observable attributes. Observable attributes, which are readily detectable, refer to gender, age, race and ethnic background while non-observable attributes, which are less visible, are defined as personal value, personality characteristic and education. It is argued that board gender diversity will benefit the firm in financial terms which should be regarded in the context of shareholder value (Dang, Nguyen & Vo, 2012). Women normally are more careful and this may be brought to bear on risk taking and this is likely to lead to better protection of the firm's investments and assets. They are also sometimes more painstaking and this may lead to better investment decisions. As noted by Robinson and Dechant (1997), at the bottom of the argument is the belief that increased demographic diversity among corporate boards will help to improve decision making and hence

positively affect firm performance. Apart from the increased number of women who are getting educated and the social awareness being created about gender equality, the increase in the number of women on the board is explained by the robustness of the evidence of performance effect of board gender diversity (Smith, Smith & Verner, 2006; Campbell & Minguez-Vera, 2008; Yi & Bob, 2009; David, Carter, Frank, Betty & Simpson, 2010; Post & Byron, 2015).

2.4 Ownership Concentration and Firm Value

The link between firm value and ownership structure is often viewed as going through the interaction and power distribution between the owners and managers of firms. In this context, the issue that has received major attention without resulting in a consensus, is whether concentrated or dispersed ownership is more conducive to good governance. Ownership concentration refers to the proportion of a firm's shares owned by a given number of the largest shareholders. Majority ownership provides the owner the rights to staff management and alter supervisory boards, or transfer firms' assets and adopt strategic decisions at general shareholders' meeting. Through management and supervisory boards, majority ownership also allows more direct executive control over the firm.

Blocking minority ownership gives the right to block a number of decisions, such as those related to increasing or reducing assets and implementing major changes in business activities which the majority shareholder may strive to implement at the general shareholders' meeting. Similarly, legal minority ownership is potentially important since the law entitles the holder of such a stake; at the general shareholders' meeting where such holder can obstruct its decisions at the general shareholders meeting by delaying implementation through lengthy court proceedings. Thus, effective legal minority shareholders may use their ownership position to delay or completely block the implementation of decisions by the majority shareholder(s). Similarly, dispersed firm ownership results in greater liquidity of firm's stock. This is viewed by some researchers as improving the information value of the stock market and therefore firm value (Holmstrom & Tirole, 1983). Ownership dispersion may be optimal provided it can give rise to controlling stakes when managerial decisions need to be blocked, or restructuring needs to be carried out (Bolton and Von Thadden, 1998).

In their study which focused on the agency problem arising from the separation of ownership and control, Shleifer and Vishny (1997) argued for the desirability of concentrated ownership because it results in better monitoring of managers, maximization of shareholder value while providing external finance for firms. Models that stress the importance of managerial initiative and incentives to acquire information in situations of high uncertainty concluded that concentrated

ownership may affect firm value (Aghion & Tirole, 1997). A high concentration of shares tends to create more pressure on managers to behave in ways that are value-maximizing. In support of this argument, Morck, Shleifer and Vishny (1988), and Shleifer and Vishny (1997) suggested that at low levels of ownership concentration is associated with an increase in firm value, but that beyond a certain level of concentration the relationship might be negative. Other studies such as Eisenberg, Sundgren and Wells (1998) and Hermalin (2006) reported results not totally in agreement with the hypothesis of a positive relationship. Using a set of variables suggested by Yermack (1996), the authors reported no evidence to support the hypothesis of a positive relationship between firm value and ownership concentration similar to studies by Holderness and Shechan (1988) and Mínguez-Vera and Martín-Ugedo (2007).

2.5 Managerial Shareholding and Firm Size

The theoretical evidence about how managerial behavior influences financing behaviors directly and indirectly emerged in the middle of 1990s such that Zwieble (1996) developed a model in which managers choose debt by their own interest. Novaes and Zingales (1995) also developed a set of a managerial model to explore how self-interested managers expropriate firm value by the tool of leverage. Wang (2006) similarly developed a contingent claims model to explain the role that shareholder-manager conflicts play in risk choice and financing decisions. Friend and Lang (1988) in support of entrenchment arising from managerial ownership examined whether managerial entrenchment induced by insiders' equity holding at least in part motivates capital structure decisions on a basis.

The literature has indicated that managerial ownership also affect the activities of firms because equity holding by management could motivate managers to make financial decisions for their own benefit or shareholders' interest thereby leading to increase or decrease in firm value (Morck, Shleifer & Vishny, 1988; McConnell & Servaes, 1990; Short & Keasey, 1999; Miguel, Pindido & Torre, 2004). Thus, the effectiveness of incentives is potentially a function of the level of managerial ownership in the firm (Davies, Hillier & McColgan, 2005). Some studies such as Boone, Field, Karpoff and Raheja (2007) and Aggarwal, Erel, Stulz and Williamson (2009) had provided evidence that supported the nonlinear relationship hypothesis between managerial ownership and firm value. While some other studies which include James (1984), Crespi, Garcia and Salas (2004) and Adams and Ferreira (2007) had shown that the relationship between managers and shareholders has the potential to influence financial decision-making which in turn impacts upon firm value.

3. Review of Empirical Studies

Yermarck (1996) analyzed a sample of 452 large U.S industrial corporations between 1984 and 1991 and consistently found an inverse relationship between board size and firm value even when regressions were carried out using numerous models such as fixed effects, random effects and OLS estimates. Even when firm value represented by Tobin's Q was substituted with other proxies such as return on assets (ROA), return on sales (ROS) and sales/assets, the negative relation persisted. Following Yermarck's analysis of large firms, Eisenberg, Sundgren and Wells (1998) tested the relationship between board size and profitability on small and midsize Finnish firms. They presented evidence of a negative association between board size and profitability, thus supporting the theory put forward by Lipton and Lorch (1992) and Jensen (1993). Similarly, Barnhart and Rosenstein (1998) found that firms with smaller board size perform better than firms with large board size, and Vafeas (1999) reported that firms with the smallest boards with a minimum of five board members are better informed about the earnings of the firm and thus can be regarded as having better monitoring abilities.

Echoing the above findings, Mak and Yuanto (2003) reported that listed firm valuations of Singaporean and Malaysian firms are highest when the board consists of five members. Bennedsen, Kongsted and Nielsen (2006), in their analysis of small and medium-sized closely held Danish corporations reported that board size had no effect on performance for a board size of below six members but found a significant negative relation between the two when the board size increased to seven members or more. In investigating the changes in board size over time, Wectman (2003) discovered that on average, board sizes of corporations (Forbes 500) decreased over the 1991-95 periods, as such Wectman (2003) argued that the cause of the decrease could partly be due to pressure from large active investors, which implies that the market generally is more confident if monitoring is carried out by smaller boards. Bhagat and Black (2002) found no evidence on the relationship between board size and firm value, although there were hints of an inverse correlation between the two. Thus, their results do not fully support Yermark (1996) findings, however, they explained that board size is often taken to be endogenously related to other control variables that may correlate with firm value. Though, Yermark (1996) included other control variables in his analysis, the approach taken may have caused the difference in results.

In an attempt to compare the effect of board structure on firm value between Japanese and Australian firms, Bonn, Yokishawa and Phan (2004) found that board size and performance which was measured as market-to-book ratio and return on assets was negatively correlated for Japanese firms, but found no

relationship between the two variables for its Australian counterpart. However, contrary to the Japanese firms, the ratios of outside directors and female directors to total board numbers had a positive impact in the Australian sample (Bonn, 2004). However, a positive impact on performance was recorded between larger board size and firm value by Mak and Li (2001), Adams and Mehran (2002) and Boone, Field, Karpoff and Raheja (2007), and by examining 147 Singaporean firms from 1995 data, Mak and Li (2001) supported the argument that board structure is endogenously determined, as the results of their ordinary least square (OLS) regression indicated that board size, leadership structure and firm size had an positive impact on firm value; but their 2SLS regressions did not support this result. On the other hand, Adam and Mehran (2002) found a positive relationship between board size and firm value as measured by Tobin's Q in the U.S banking industry, which is contrary to the findings of Yermack (1996) and Eisenberg, Sundgren and Wells (1998) in US non-financial firms. Adam and Mehran's results suggests that such performance relationship may be industry specific, indicating that larger boards works well for certain type of firms depending on their organizational structures.

Other researchers such as Lehn, Patro and Zhao (2009) in their study of 88 U.S. firms between 1935 and 2000 found no significant relationship between size and firm value, though Ajala, Amuda and Arulogun (2012) in evaluating the effects of corporate governance on the performance of Nigerian banks using Pearson correlation and regression analysis, found negative but significant relationship between board size and financial performance. Hence, some researchers have studied this problem with findings showing no relationship between board size and firm value, as Bonn (2004), and Brown and Gorgens (2009) found no relationship between board size and value for Australian and Italian firms. However, in studies that explored the relationships between board size and opportunistic accounting in the developed economies, Jensen (1993), Xie, Davidson and DaDalt (2003), Zhou and Chen (2004) and Wang, Chuang and Lee (2010) revealed inconsistent results. This is because of the consistent conflicting arguments supported by equally inconclusive empirical results that characterize the discussions regarding an effective board size. Therefore relationship between board size and firm value varies from positive to negative (Yermack, 1996; Eisenberg, Sundgren & Wells, 1998; Loderer & Peyer, 2002; Kyereboah-Coleman & Biekpe, 2005).

Many of the empirical studies that examined the impact of the insider-outsider ratio on boards have found no consistent evidence to suggest that increasing the percentage of outsiders on the board will enhance firm value. If anything, the studies have suggested that pushing too far to remove inside and affiliated

directors may harm firm performance by depriving boards of the valuable firm and industry-specific knowledge they provide (Fama & Jensen, 1983; Baysinger & Hoskisson, 1990). A few studies however had identified a positive relationship between the percentage of outside directors and firm performance (Schellenger, Wood & Tashakori, 1989; Pearce & Zahra, 1992; Daily & Dalton, 1993), while other studies found no significant relationship between board composition and firm value (Hermalin & Weisbach, 1991; Mallette & Fowler, 1992; Daily & Johnson, 1997; Klein, 1998; Bhagat & Black, 1999; Dulewicz & Herbert, 2004). Dalton, Daily, Ellstrand and Johnson (1998) and Wagner, Stimpert and Fubara (1998) in trying to explain these conflicting findings conducted a meta-analyses of the research on board composition and performance.

In Daily and Johnson (1997) and Klein (1998) analysis of 54 studies, they found no evidence of a link between insider-outsider ratio and company financial performance which showed that neither the size of the firm nor the measures used for director type or firm performance, affected the findings. Wagner, Stimpert and Fubara (1998) on the other hand analyzed 29 studies and found similar results, with their meta-analysis indicating that increasing the number of insiders or outsiders had a positive effect on performance, suggesting that board size may be more important than composition. They also found some evidence of a U-shaped relationship between the insider-outsider ratio and performance, as boards with a very high or low percentage of insiders performed better than those with a more even mix of insiders and outsiders. In contrast, Barnhart and Rosenstein (1998) and Barnhart, Marr and Rosentein (2006) found evidence of a reverse, curvilinear relationship between the percentage of independent directors, as classified by Institutional Shareholder Services (ISS), and some performance measures. They reported that firms where boards have a clear majority of independent directors or very few independent directors had lower stock market performance. Peng (2004) also analyzed a sample of China's largest public companies and found that increasing the percentage of independent directors had no impact on either return on equity (ROE) or sales growth, but that adding more affiliated, outside directors, was linked to higher subsequent sales growth but not ROE. He attributes this result to the role these directors play in securing resources for the firm as part of Chinese business networks.

An increasing number of empirical studies which investigated the link between board diversity and firm financial performance across different countries such as the United States (Erhardt, Werbel & Shrader, 2003), Indonesia (Darmadi, 2011) and Denmark, Norway and Sweden (Randoy, Thomsen & Oxelheim, 2006) strongly support more women on the board of directors. Oba (2013) found that female directors' presence had a positive statistical significance on financial

performance using return on capital employed (ROCE) as a proxy for financial performance. Similarly in Nigeria, a study by Garba and Abubakar (2014) using ROA, ROE and Tobin's Q as measures of performance and applying the Feasible Generalized Least Square (FGLS) and random effects estimators found that gender diversity had a positive statistical significance on the performance of insurance firms in Nigeria. This was supported by the results of the findings by Man and Kong (2011) and Burke (2000) who suggested that the presence of women directors and firms' performance are correlated positively.

Also, Dang, Ngurjen and Vo (2012) found that firms with at least three (3) women on corporate boards have a better performance, as measured by Tobin's Q and returns on assets (ROA), and they are significantly large in terms of sales. Several empirical studies showed a positive association between the proportion of female directors in the boardroom and firm financial performance in the United States (Carter, Simkins & Simpson, 2003; Erhardt, Werbel &, Shrader, 2003; Hussein & Kiwia, 2009; Carter, D'Souza, Simkins & Simpson, 2010), Denmark (Smith & Verneret, 2006) and Spain (Campbell & Minguez-Vera, 2008). Carter, Simkins and Simpson (2003) reported a significant positive relation of board representation by minorities and females and the organizational value which is measured by the approximation of Tobin's Q on Fortune 1000 companies. Their findings also established the negative relation of the board diversity and the number of insiders. Shukeril, Shinl and Shaaril (2012) however, found no relation between board gender diversity and firm performance. This means that increasing or decreasing females on the board would not give significant effect to firm performance. Again, the participation of females on boards varies from country to country. For instance, almost all major companies' boards are dominated by males in Australia, France, Europe, Sweden, and Norway with women directors constituting only 8.3%, 7.6%, 9.7%, 26.9% and 44.2% respectively. On the contrary, 49% of the ASX200 companies are found to include females on boards.

Similar studies of FTSE200 companies in the United Kingdom, FP500 companies in Canada and S&P500 companies in the United States of America show 77%, 52.8% and 91% of them with a female director respectively. In the United States (Zahra & Stanton, 1988; Shrader, Blackburn & Iles, 1997; Farrell & Hersch, 2005; Hussein & Kiwia, 2009; Carter, D'Souza, Simkins & Simpson, 2010) and Denmark (Smith, Smith & Verner, 2006) gender diversity was not found to be a significant determinant of firm financial performance. Using the data of all listed Danish companies from 1998 to 2001, Smith, Smith and Verner (2006) tested whether there is a link between fraction of woman board members and the financial performance with an indicator of Tobin's Q and no significant relation is addressed. Though no link was shown, the findings revealed the circumstance that

women are under-represented in boardrooms in accordance with the Danish evidence.

Again, Shrader, Blackburn and lles (1997) employed the data of 200 companies with the highest market value in the United States and found that there is no significant influence of the percentage of women representation on board in relation to financial performance which is measured by the profitability ratio. Farrell and Hersch (2005) indicated that there is no persuasive evidence proving the likelihood of improving firm performance after adding a women director in the boardroom. Zahra and Stanton (1988) concluded with similar result to that of Carter, D'Souza, Simkins and Simpson (2010) who documented a neither positive nor negative relationship between gender diversity and Tobin's Q as a proxy for firm value on firms in S&P 500 index from 1998 to 2002. In contrast, Adams and Ferreir (2009) and Darmadi (2011) came out with a different result as compared with other studies. Adams and Ferreir (2009) analyzed the correlation between gender diversity and firm performance with Tobin's Q as an indicator. The study suggested that imposing gender quota on board is not conducive to good corporate governance. For a sample of companies listed on the Indonesia Stock Exchange for the financial year of 2007, Darmadi (2011) documented the negative effect of the level of female board representation on financial performance.

A high concentration of shares tends to create more pressure on managers to behave in ways that are value-maximizing, and in support of this argument, Morck, Shleifer and Vishny (1988), and Shleifer and Vishny (1997) suggested that at low levels of ownership concentration is associated with an increase in firm value, but that beyond a certain level of concentration the relationship might be negative. Other studies such as Eisenberg, Sundgren and Wells (1998) and Hermalin (2006) reported results not totally in agreement with the hypothesis of a positive relationship. Using a set of variables suggested by Yermack (1996), the authors reported no evidence to support the hypothesis of a positive relationship between firm value and ownership concentration similar to studies by Holderness and Shechan (1988) and Mínguez-Vera and Martín-Ugedo (2007).

Similarly, there has been much studies which indicated that managerial ownership also affects firm value, because equity holding by management could motivate managers to make financial decisions for their own benefit or shareholders' interest thereby leading to increase or decrease in firm value (Morck, Shleifer & Vishny, 1988; McConnell & Servaes, 1990; Short & Keasey, 1999; Miguel, Pindido & Torre, 2004). Thus, the effectiveness of incentives is potentially a function of the level of managerial ownership in the firm (Davies, Hillier & McColgan, 2005). Some studies as Boone, Field, Karpoff and Raheja (2007)

and Aggarwal, Erel, Stulz and Williamson (2009) had provided evidence that supported the nonlinear relationship hypothesis between managerial ownership and firm value. While some other studies which includes James (1984), Crespi, Garcia and Salas (2004) and Adams and Ferreira (2007) had shown that the relationship between managers and shareholders has the potential to influence financial decision-making which in turn impacts upon firm value.

The issue about how managerial ownership affects firm value is also important, because Brailsford, Oliver and Pua, (2002) argued that firm managers and external block owners are two key groups of shareholders who have powerful influence on the decisions in a firm's resource allocation. In the pioneering work about the relationship between managerial ownership and firm value by Morck, Shleifer and Vishny (1988), using piecewise linear regressions to estimate the relationship between Tobin's Q and the shareholdings of the board of directors for 371 Fortune 500 firms in 1980 found a positive relation between ownership and Tobin's Q in the 0% to 5% board ownership range which was dominated by the convergence of interest effect of management; while there was a negative and less pronounced relation in the 5% to 25% range in which the entrenchment effect overpasses the convergence of interest effect. We agree with Jensen and Meckling (1976) and Demsetz and Lehn (1985) who argued that managerial equity ownership will provide managers incentives to maximize firm value. Using U.S. data, Morck, Shleifer, and Vishny (1988) empirically showed a non-linear relation between firm value and managerial ownership where firm value increases up to a certain level of managerial ownership of about 5% and then decreases as management holdings further rise. Similar results were also found in McConnell and Servaes (1990) and Hermalin and Weisbach (1991), but no evidence was found of a non-linear relation between firm value and managerial ownership from their study of Japan. However they found that firm value was positively related to managerial ownership in Japan which is consistent with the prediction by Jensen and Mecking (1976).

Short and Keasey (1999) and Miguel, Pindido and Torre (2004) in studying the association of management ownership and firm value using United Kingdom (UK) and Spanish data found similar conclusion respectively. Davies, Hillier and McColgan (2005) echoed the above conclusions but extended the specification of management holdings from cubic to quintic and found similar nonlinear relationship between managerial ownership and firm value. Ruan, Tian and Ma (2009) employing a data set that comprised of firms identified as S&P 500 observed that capital structure can also act as an intermediate variable, which is affected by managerial ownership but eventually influences firm value. Berger, Ofek and Yermack (1997) used cross-sectional analysis to find evidence that firm

leverage is affected by the degree of managerial entrenchment, and that entrenched managers seek to avoid debt. While Brailsford, Oliver and Pua (2002) used evidence from Australia to get a nonlinear relation between the level of equity stake owned by insiders and capital structure measured by debt-equity ratio, and supported the effects of convergence-of-interests and management entrenchment. Leech and Leahy (1991) and Kim, Krinsky and Lee (1997) based on the convergence of interests hypothesis, proposed that managerial shareholding is positively correlated with firm value. Similarly, Thomsen and Pedersen (2000) mentioned that managerial shareholding and firm value are simultaneously determined, such that firm value has positive effects on the managerial shareholding, and managerial shareholding has positive effects on firm value. On the contrary, the entrenchment hypothesis states that a higher managerial shareholding gives the management greater control of the firm and reduces the effects of external controls on the management. Several studies have found a correlation between managerial shareholding and firm value and indicated that the relationship is possibly nonlinear (Morck, Shleifer, and Vishny, 1988; McConnell and Servaes, 1990).

4. Materials and Methods

The paper adopts correlational research design in order to establish the link between corporate governance components and firm value. Being a positivist approach, the design is associated with scientific, experimental, quantitative and deductive frameworks where researchers seek specific quantifiable observations, by the use of statistics and experiments to test the hypotheses (Habbash, 2010). The population of the study consists of all incorporated petroleum firms listed on the Nigerian Stock Exchange (NSE) that carried on with operations in Nigeria during the study period of 1st January, 2008 to 31st December, 2015. To be part of the population, a firm must have published its full annual reports throughout the period. A total of six (6) petroleum firms were found to have satisfied this criterion and were therefore used as the population of the study. The paper adopts census approach by studying all the six firms.

The study extracts balanced longitudinal panel data from the financial statements of the firms for the period 2008-2015. The Ordinary Least Square (OLS) multiple regression was used as to reveal the relationship between corporate governance components and firm value. To establish the linear relationship between the dependent and independent variables, and in line with Bohren and Odegaard (2001), Bhagat and Jefferis (2002) and Boone, Field, Karpoff and Raheja (2007), the study states the general multi-factor valuation model as:

$$V = f(BCOS, \varepsilon) \qquad (1)$$

Where:

FV = Firm value
BCOS = Board characteristics and ownership structure variables
ε = Error term.

The model shows that the dependent variable, firm value (regressand) can be affected by the set of independent variables (regressors) that are carefully selected from the elements of board characteristics and ownership structure. Firm value is represented by Tobin's Q while BCOS (board characteristics and ownership structure) stands for board size, board independence, gender diversity, ownership concentration and managerial shareholding.

It is noteworthy that the literature has thus identified concentration, managerial, institutional, foreign, and block shareholding as the main components of ownership structure in a firm. In the petroleum sub-sector, there is little or no variation among petroleum firms in Nigeria with regard to foreign and institutional shareholding in view of the fact that most of the firms are foreign-and-institutional-owned. For instance, though institutional shareholders possess professional knowledge and supervising abilities so that they are more capable of monitoring the operations of the firm thereby contributing to firm value (Fama & Jensen, 1983; Chaganti, Mahajan & Sharma 1985; McConnell & Servaes, 1990), its metric in research is usually represented by a dummy variable to indicate presence or absence of institutional shareholders in a firm (Gompers, Ishii & Metric, 2003; Klapper & Love, 2004; Black & Khanna, 2007; Black, Gledson-de-Carvalho & Gorga, 2010; Black, Gledson-de-Carvalho, Khanna, Kim & Yurtoglu, 2013). Given that all listed petroleum firms in Nigeria have institutional shareholders as easily discerned from their financial statement in addition to their foreign-based, including these components in a study would result in variable redundancy.

The modified functional relationship between the variables is given in the following regression equation as:

$$Y_{it} = a + \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \beta_4 X_{it} + \beta_5 X_{it} + \varepsilon_{it} \quad (2)$$

By incorporating the dependent and independent variables into the equation, the model of the study is as follows:

$$Tobin's\ Q_{it} = \alpha + \beta_1 BOSZ_{it} + \beta_2 BIND_{it} + \beta_3 BOGD_{it} + \beta_4 OWNC_{it} + \beta_5 MSHD_{it} + \varepsilon_{it} \quad (3)$$

Where:

Tobin's Q	Value of firm *i* at time *t*
BOSZ	Board size of firm *i* at time *t*
BIND	Board independence of firm *i* at time *t*
BOGD	Board gender diversity of firm *i* at time *t*
OWNC	Ownership concentration of firm *i* at time *t*
MSHD	Managerial shareholding of firm *i* at time *t*
α, β	Parameters to be estimated
ε	Error term

It was expected that the sign of β_1 would be negative as literature suggests a negative relationship between firm value and a bigger board. β_2 being the coefficient of board independence was expected to have a positive relationship with firm value. The sign β_3 would be negative as literature suggests a negative relationship for females on the board and firm value for the firms. β_4, and β_5, would be positive as ownership concentration and managerial shareholding do not harm firm value. The outcome of the multiple regression analysis based on the modified model would reveal the relationship of firm value on board characteristics and ownership structure of listed petroleum firms in Nigeria.

The dependent and independent variables of the study are measured as follows:

Table 1: Variables Measurement

Variable	Type	Measurement
Firm Value (Tobin's Q)	Dependent	Tobin's Q measured as modified by Chung and Pruitt (1994) and adopted by Angulo and Rialp (2007) among others. Hence, MVE (annual close stock price x annual outstanding ordinary shares) + LPS (liquidating value of firm preferred stock) + DEBT (short-term assets - short-term liabilities + long-term debt) / BTA (book value of total assets)
Board Size (BOSZ)	Independent	Number of directors on the board (Pfeffer, 1972; Chaganti,

		Mahajan & Sharma, 1985).
Board Independence (BIND)	Independent	The percentage of non-executive directors to total board size (Linck, Netter & Yang, 2008).
Board Gender Diversity (BOGD)	Independent	Number of females on the board (Daily, and Dalton, 1997; Hillman, Cannella & Paetzold, 2000).
Ownership Concentration (OWNC)	Independent	The proportion of shares owned by the largest shareholders to total number of shares issued expressed as a percentage (Shleifer & Vishny, 1997).
Managerial Shareholding (MSHD)	Independent	Total number of shares owned by management staff to total number of shares issued expressed as a percentage (Ali-shah, Ali-butt & Hasan, 2009).

Source: Authors' compilation from various sources

5. Presentation and Analysis of Results

The summary of the descriptive statistics generated in respect of both the dependent and independent variables is presented in table 2

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max	S. Wilk
Tobin's Q	2.807083	2.386506	0.28	10.01	0.00001
BOSZ	9	3.457954	5	16	0.02694
BIND	0.53125	0.2008982	0.25	0.9	0.01404
BOGD	0.8125	0.6069193	0	2	0.48444
OWNC	55.29792	18.52407	18.58	74.4	0.00007
MSHD	0.3708333	0.274411	0.1	0.9	0.00039
No. of Cross Sections	6				
Observations	48				

Source: STATA Output

Table 2 shows that the mean value of Tobin's Q is 2.81 with a standard deviation of 2.39. This implies that there is no much variation in firm value across the firms. This is further attested to the minimum of 0.28 and maximum of 10.01. Regarding the independent variables, board independence (BIND) has a mean value of 0.53

with standard deviation of 0.20. This implies that BIND deviates significantly across the firms. The minimum values of 0.25 and maximum of 0.9 shows an insignificant variability in the data. The average mean is greater than the standard deviation and indicates no great difference in the data. Board size (BOSZ) has an average mean value of 9 and standard deviation of 3.46. Board gender (BOGD) reveals an average of 0.81 and a standard deviation of 0.61 with a range of values from 0 to 2. Ownership concentration (OWNC) and Managerial shareholding (MSHD) exhibit averages of 55.30 and 0.37 respectively, while their respective standard deviations are 18.52 and 0.27 indicating that there is some disparity regarding the behavior of the variables across the firms under study. The observations of OWNC range from 18.58 to 74.40, while that of MSHD range from 0.1 to 0.9. Overall, the standard deviations of all the variables vary slightly from the respective means of the data. This indicates only slight variations regarding the firm's behavior to these phenomena. In addition, the Shapiro-Wilk test for normality of data indicates that only BOSZ is normally distributed. Generally, non-normality of data does not affect the validity of estimations with regression.

To examine the association between and among the variables, the Pearson Correlation Coefficient was employed. Though correlation analysis does not lend itself to statistical inference, it is relevant in deducing the direction and extent of association between dependent and independent variables and among independent variables themselves. The summary is presented in table 3.

Table 3: Correlation Matrix

Variable	Tobin's Q	BIND	BOSZ	BOGD	OWNC	MSHD
Tobin's Q	1.0000					
BIND	-0.2956	1.0000				
BOSZ	-0.3016	-0.4661	1.0000			
BOGD	0.1894	-0.5791	0.7097	1.0000		
OWNC	0.3200	0.2953	-0.5972	-0.4567	1.0000	
MSHD	-0.3153	0.4121	-0.3924	-0.5062	-0.1455	1.0000

Source: STATA Output

Table 3 shows the correlation between the dependent variable, Tobin's Q and the independent variables, BIND, BOSZ, BOGD, OWNC and MSHD on one hand and among the independent variable themselves on the other. Generally, high correlation is expected between dependent and independent variables while low correlation is expected among independent variables. According to Gujarati (2004), a correlation coefficient between two independent variables above 0.80 is

considered excessive and thus certain measures are required to correct that anomaly in the data. From the table, it can be seen that all the correlation coefficients among the independent variables are below 0.80. This points to the absence of possible multicollinearity though the value inflation factor (VIF) and tolerance value (TV) test is required to confirm the assumption. It also suggests that the variables are well selected and can fit in the same regression model.

The table reveals an inverse correlation between the dependent variable Tobin's Q and the three explanatory variables of BIND, BOSZ and MSHD with coefficients of -0.29, -0.30 and -0.32 respectively. This implies that the three explanatory variables move in opposite direction with Tobin's Q, which suggests that the lower their values the higher the value of the firms and when these explanatory variables increase its individual levels, Tobin's Q declines. The table also reveals that BOGD and OWNC exhibit positive correlations with Tobin's Q, with coefficients of 0.19 and 0.32 respectively. This means that the two explanatory variables and the outcome variable move in the same direction, which implies that as both variables increase, Tobin's Q also increases. In addition, the table reveals that all the five explanatory variables have significant level of relationship with the dependent variable.

With respect to the association among the independent variables themselves, BIND is found to be inversely correlated with BOSZ and BOGD based on the values of -0.47 and -0.58 respectively, while it moves in the same direction with OWNC and MSHD as per the values of 0.30 and 0.41 respectively. BOSZ positively correlates with BOGD with a value of 0.71 and is negatively associated with OWNC and MSHD with values of -0.60 and -0.39. More so, BOGD has a negative association with OWNC and MSHD with values of -0.46 and -0.51. Lastly, the association between OWNC and MSHD is negative with a value of -0.15. It is noteworthy that the highest absolute correlation coefficient among the explanatory variables is between BOSZ and BOGD which is approximately 0.71, while the lowest degree of association is between OWNC and MSHD at -0.15. This means that the level of correlation between and among all the independent variables is of harmless effect.

The dataset was then subjected to a Pooled-OLS regression and thereafter, tests for multicollinearity and heteroskedasticity were carried out in order to improve the robustness of the results. The tests were considered important for the regression estimation to satisfy the assumptions of the ordinary least square (OLS) test of homoscedasticity and of the absence of high correlations among the independent variables. Table 4 shows the results of the value inflation factor

(VIF) and tolerance value (TV), which represent the commonly used measures of multicollinearity between explanatory variables.

Table 4: Test for Multicollinearity

Variable	**VIF**	**TV (1/VIF)**
BOSZ	1.58	0.354914
BIND	2,82	0.631683
BOGD	2.76	0.362838
OWNC	2.35	0.424888
MSHD	2.09	0.478040
Mean VIF	**2.32**	

Source: STATA Output

From table 4, the VIF and TV are found to be consistently smaller than 10 and above 0.10 respectively indicating the absence of multicollinearity as suggested by Neter, Kutner, Nachtsheirn and Wasserman (1996), Tobachnick and Fidell (1996) and Cassey and Anderson (1999). The low mean VIF of 2.32 is also a pointer to the mild correlation among the regressors. This shows the appropriateness and fitness of the explanatory variables as used in the model. In addition, the Breusch-Pagan/Cook-Weisberg test was used to test for the existence of heteroskedasticity. The null hypothesis in this test assumes that the variance of the residuals is constant. If the p-value is significant at 5%, then there is substantial evidence to reject the null hypothesis indicating the presence of heteroskedasticity. The result reveals that the chi^2 value is 12.04 and the p-value is 0.0005 which is statistically significant at 5% level of significance. This indicates presence of heteroskedasticity.

Since the data is in panel form, fixed and random effect models were run and Hausman Specification test was used to decide between the results of the two models. The result of the Hausman test reveals a chi^2 value of 2.43 and p-value of 0.79. The implication of the insignificant p-value is that the random effect model is preferred to the fixed effect model. The full results of the fixed and random effect models are attached as appendix.

In order to test for heterogeneity of the data to ascertain the presence or absence of panel effect in the dataset due to size variation among the firms used in the study, the result of the random effect was subjected to Breusch and Pagan Lagrangian multiplier test. The rule for the test is that a p-value of greater than 0.05 level of significance implies absence of panel effect in a dataset. Absence of panel effect in a data set means that the Pooled-OLS regression model will suffice

(Park, 2011). The result reveals a chi^2 of 0.00 and p-value of 1.00 suggesting that the panel data used for the study is free from cross-sectional effect and heterogeneity. It is noteworthy that unlike pooled OLS regression, GLS random effect has the ability to automatically correct for heteroskedasticity in case of its presence in a dataset, and where pooled-OLS regression is opted for due to the absence of cross-sectional effect, heteroskedasticity has to be checked and if present it has to be corrected through robust pooled-OLS option. Having established the absence of panel effect in the data, a robust pooled-OLS result was obtained and used for analysis and testing of hypotheses.

Table 5 contains the summary of the robust pooled-OLS regression output. The information was analysed and discussed in light of previous studies. The information was also used for testing the hypotheses of the study.

Table 5: Summary of Robust Pooled-OLS Regression Result

	Expected relationship	Tobin's Q
C		8.170848
		(3.20)
		[0.003]**
BOSZ	-	-0.593136
		(-4.66)
		[0.000]***
BIND	+	-3.773971
		(-2.76)
		[0.009]**
BOGD	-	2.208206
		(3.48)
		[0.001]**
OWNC	+	0.016128
		(0.83)
		[0.409]
MSHD	+	-1.905470
		(-0.79)
		[0.080]*
R-Squared		0.57
Adj-R-Squared		0.52
F-Statistic		10.95
		[0.0000]***
Number of		48

Observations

Source: STATA Output
Note: (1) Parentheses ( ) are t-values while Brackets [ ] are p-values.
(2) *** 1%, ** 5%, * 10% level of significance.

Table 5 indicates that the aggregate influence of the explanatory variables included in the model are able to explain the dependent variable up to 52% as indicated by the adjusted R^2, while the remaining 48% are controlled by other factors that are not included in the model. The F-statistical value of 10.95 which is significant at 1% shows that the model is fit and therefore provides substantial evidence that board characteristics and ownership structure have significant impact on firm value of listed petroleum firms in Nigeria. Substituting the coefficients of the variables in the regression equation gives the following:

Tobin's Q = 8.17 - 3.77BIND – 0.59BOSZ + 2.21BOGD + 0.02OWNC – 1.91MSHD

The table shows that board size (BOSZ) has a t-value of -4.66 and a coefficient of -0.59 with a p-value of 0.00 which is significant at 1% level of significance. This means that BOSZ has a negative but significant impact on firm value of listed petroleum firms in Nigeria. It also shows that when there is an increase of an additional director, the size of the board of directors is negatively affected. This finding supports the findings of Coles, Daniel and Naveen (2008) and Dewi (2012) whose studies indicated that size is not related to firm value. They argued that size is dependent on each individual firm's need of advising, monitoring and age. On the contrary, the finding of this study contrasts with the argument of the existence of strong relationship between board size and firm value. It however, negates the presumption of absolute positive relationship based on the premise that the larger the board size the better the chances that more quality ideas and better decisions would be made for the benefit of the shareholders. It is argued from the finding of this study that large boards are not significantly useful for better firm value. In view of the high costs associated with a large number of board members, the benefit would only manifest where there is a corresponding increase in the quality of ideas and better decisions in the board. The finding provides sufficient evidence to reject the first hypothesis ($H0_1$) that BOSZ has no significant impact on firm value of listed petroleum firms in Nigeria.

The table also shows that board independence (BIND) has an inverse relationship with firm value. This is based on coefficient value of -3.77 and t-value of -2.76. The p-value of 0.009 shows that the relationship is significant. This implies that a 1% increase in BIND will lead to a decline in firm value of listed petroleum firms

in Nigeria by 3.77% and vice versa. This supports the findings of Weisbach (1988), Daily and Dalton (1992), Daily and Ellstrand (1996), Klein (1998), Weir, Laing and McKnight (2001), Bhagat and Bolton (2005) and Pathan and Faff (2013) who concluded in their studies that there exit no positive significant relationship in terms of accounting profits between board independence and firm value. The finding contradicts the studies of Pfeffer and Salancik (1978), Byrd and Hickman (1992), Rosenstein and Wyatt (1997), Vafeas (1999), Gupta, Otley and Young (2008) and Arosa, Iturralde and Maseda (2010) which showed that firms with high proportion of independent directors will perform better.

The explanation for the finding of this study could be that because directors' compensation of petroleum firms operating in Nigeria is high, therefore an increase in the number of independent directors would translate to an increase in firm value only if such independent directors have the required expertise and they always participate in qualitative decisions with little or no influence from other board members. Based on this finding, the study could not reject the second hypothesis ($H0_2$) that BIND has no significant impact on firm value of listed petroleum firms in Nigeria.

The table further reveals that board gender diversity (BOGD) has a positive coefficient of 2.21 and t-value of 3.48 that is significant at 1% level of significance. This means that BOGD has significant positive impact on firm value of listed petroleum firms in Nigeria. It similarly suggest that an increase of one female member on the board will lead to a 2.21% increase in firm value. This implies that the inclusion of women on the board of listed petroleum firms in Nigeria has a positive and significant impact on improving firm value for shareholders. This finding agrees with the work of Burke (2000), Man and Kong (2011), Nuryaman (2012) and Catalyst (2014) who suggested that the presence of women directors and firm value are positively and significantly related. However, the finding does not support the study of Shukeril, Shinl and Shararil (2012) who documented significant negative relationship between the number of females on the board and firm value. The possible explanation for this is that the presence of females on the board does not guarantee a higher firm value without reference to skills, education, and experience as contribution to the board. The above finding provides sufficient evidence to reject the third hypothesis ($H0_3$) that BOGD has no significant impact on firm value of listed petroleum firms in Nigeria.

The table further shows that ownership concentration (OWNC) has a positive association with Tobin's Q of listed petroleum firms in Nigeria. The coefficient and t-value of OWNC are 0.02 and 0.83 respectively with a p-value of 0.41. This suggests that a 1% increase in ownership concentration will lead to an increase in

firm value by only 0.02%. It also means that based on the finding of this study, when there is an increase in the level of ownership concentration the firm value of listed petroleum firms will increase, though not significantly. This indicates that block investors do not necessarily consider concentrated ownership as a determinant of investment decision. The finding contradicts the findings of Shleifer and Vishny (1997) and Alimehmeti and Paletta (2012) which focused on the agency problem arising from the separation of ownership and control, who argued for the desirability of concentrated ownership because according to them it results in better monitoring of managers, maximization of shareholders value as well as providing external finance for firms. This implies that a concentration of shareholding tends to create more pressure on managers to behave in ways that are not likely to satisfy the interest of the shareholders. Morck, Shleifer and Vishny (1988), Shleifer and Vishny (1997), Gorton and Schmid (2000) and Adjaoud and Ben-Amar (2010) argued that concentrated ownership are value-maximizing provided it did not exceed a certain level. These authors concluded that at low levels, ownership concentration is associated with an increase in firm value, but beyond a certain level of concentration the relationship might be negative. Based on this finding, the study fails to reject the fourth hypothesis ($H0_4$) that OWNC has no significant impact on firm value of listed petroleum firms in Nigeria.

In addition, managerial shareholding (MSHD) reports a t-value of -1.79 and a beta coefficient of -1.91 with a p-value of 0.08 that is significant at 10% level of significance. This means that MSHD has an inverse but significant impact on firm value of listed petroleum firms in Nigeria. It also connotes that when there is an increase in the level of MSHD by 1%, the firm values of listed petroleum firms in Nigeria is likely to be negatively affected by 1.91%. This negates the study of Morck, Shleifer and Vishny (1988) who found a significant positive relation between managerial ownership and firm value.

The justification for our finding is based on the argument that managerial shareholding has a non-linear relationship with firm value in emerging markets like Nigeria. Hence, the finding of this study can be related to the findings of Wei, Xie and Zhang (2005), Lee, Ku, Chen and Chen (2012). Their studies found a nonlinear relationship between managerial ownership and firm value in a large number of firms in emerging markets, thereby revealing that management and insiders have the ability to engage in expropriation of shareholders' benefits. The finding of this study with respect to managerial shareholding provided sufficient evidence for the rejection of the fifth hypothesis ($H0_5$) that MSHD has no significant impact on firm value of listed petroleum firms in Nigeria.

Overall, the table reveals that the combined outcome of all the explanatory variables used in this study has significant impact on the firm value of listed petroleum firms in Nigeria as evident from the model's F-statistics which is significant at 1% level of significance. At the individual level, the results indicates that BOSZ, BIND, BOGD and MSHD have significant impact on firm value, while OWNC has no significant impact on firm value of listed petroleum firms operating in Nigeria.

The summary of the results based on the four models is presented in table 6 to enable comparison between the results obtained for the three models.

Table 6: Summary of Results obtained from the Models

Variable	Pooled-OLS	Fixed Effect	Random Effect	Robust Pooled-OLS
BOSZ	-0.59313604***	-0.32991222	-0.59313604***	-0.59313604***
BIND	-3.7739705**	-3.2238801	-3.7739705**	-3.7739705**
BOGD	2.2082061**	1.806558**	2.2082061***	2.2082061**
OWNC	0.01612766	0.02014093	0.01612766	0.01612766
MSHD	-1.9054698	-0.37919355	-1.9054698	-1.9054698*
CONS	8.1708482**	5.0480174	8.1708482***	8.1708482**
Chi^2			55.363302	
N	48	48	48	48
R^2	0.56	0.53		0.57

Legend: * p<.1; ** p<.05; *** p<.001
Source: STATA Output

Table 6 showed the summary of the pooled-OLS, fixed effect, random effect and robust pooled-OLS results extracted from the regression output. From the summary, the robust pooled-OLS result turned out to be the best followed by the random effect.

6. Conclusions and Recommendations

The analysis carried out in this paper clearly shows that overall, board characteristics and ownership structure variables have significant impact on firm value of listed petroleum firms in Nigeria. Specifically, of the five board characteristics and ownership structure variables used in the study, board independence, board size, board gender diversity and managerial shareholding have significant relationship with firm value, while ownership concentration has no significant relationship with firm value of listed petroleum firms in Nigeria. Based on the above, the study concludes that board characteristics and ownership structure have an impact on the firm value of listed petroleum firms in Nigeria

though the direction and extent of the association vary from one element of board characteristics and ownership structure to another.

In view of the foregoing, this study recommends that the negative but significant impact of board size on firm value clearly shows that when there is an increase in the number of directors the size of the board is affected and consequently firm value. In view of the high costs associated with a large board, there should be an optimal board size of between five (5) and sixteen (16) directors as could be inferred from the result of descriptive statistics. The study also recommends appointment of less non-executive directors who are independent of management and the activities of the firm and who at the same time will bring in experience and expertise that can impact positively on firm value. This recommendation is based on the significant inverse relationship that exists between independent directors and firm value. The relationship, which may be attributed to costs associated with an additional independent director because from the result, a 1% increase in board independence will lead to a decline in firm value by about 3.77%. In addition, the study recommends that more women should be appointed into Boards of listed petroleum firms in Nigeria based on their skills, education, expertise and experience and not as symbol of legitimacy. This is because the significant positive association that our result exhibits shows that an increase in number of females on the Board has the capacity to increase firm value by about 2.21%.

References

Adams, R. B. & Ferreir, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), 291-309.

Adams, R. B. & Ferreira, D. (2007). A theory of friendly boards. *Journal of Finance, (*62), 217-250.

Adams, R. B. & Mehran, H. (2002). *Board structure and banking firm performance.* Working Paper. Federal Reserve Bank of New York.

Adams, R. B. (2010). *What do boards do? Evidence from board committee and director compensation data.* EFA 2005 Moscow Meetings Paper, SSRN.

Adjaoud, F., & Ben-Amar, W. (2010). Corporate governance and dividend policy: Shareholders'

Aggarwal, R., Erel, I., Stulz, R. & Williamson, R. (2009). Differences in governance practices between U.S. and foreign firms: Measurement, causes, and consequences. *Review of Financial Studies, (*22), 3132-3169.

Aghion, P. & Tirole, J. (1997). Formal and real authority in organizations. *Journal of Political Economy*, (55), 1-27.

Agrawal, A. & Knoeber, C. (1996). Firm performance and mechanisms to control agency problems between managers and shareholders. *Journal of Financial and Quantitative Analysis,* 31(3), 377-397.

Ahunwan, B. (2003). *Globalization and corporate governance in developing countries.* Transnational Publishers, New York.

Ajala, O. A., Amuda, T. & Arulogun, L. (2012). Evaluating the effects of corporate governance on the performance of Nigerian banking sector. *Review of Contemporary Business Research*, 1(1), 32-42.

Alimehmeti, G. & Paletta, A. (2012). Ownership concentration and effects over firm performance: Evidence from Italy. *European Scientific Journal October edition vol. 8,* (22).

Ali-shah, S. Z., Ali-butt, S. & Hasan, A. (2009). Corporate governance and earnings management: An empirical evidence from Pakistan listed companies. *European Journal of Scientific Research,* 26(4), 624-638.

Angulo, L. F. & Rialp, J. (2007). *The interplay between cumulative customer satisfaction and brand value: Its effect on Cash-flow, ROI and Tobin's Q.* Department d'Economia de l'Empresa Fac. CC. Economiques i Empresarials – Edifici B Universitat Autonoma de Barcelona 08193 Bellaterra (Cerdanyola del Valles) Barcelona (Espanya).

Anya, A.O. (2002). Science, oil and the future of Nigeria economy. *The Guardian*, 16. March

Arosa, B., Iturralde, T. & Maseda, A. (2010). Outsiders on the board of directors and firm performance: Evidence from Spain. *Journal of Family Business Strategy*, 1, 236–245.

Babatunde, M. & Olaniran, O. (2009). The effect of internal and external mechanisms on corporate performance of corporate firms in Nigeria. *Corporate Ownership and Control*, 7(2), 330-343.

Barnhart, S. W. & Rosenstein, S. (1998). Board Composition, managerial ownership and firm performance: An empirical analysis. *Financial Review*, 33(4), 1-36.

Barnhart, S. W., Marr, M. W. and Rosenstein, S. (2006). Firm performance and board composition: Some new evidence of managerial ownership and firm performance: An empirical analysis. *Financial Review,* 33(4), 1.

Barth, M., Beaver, W. & Landsman, W. (2001). The relevance of the value relevance literature for financial accounting standard setting: Another view. *Journal of Accounting and Economics,* (31), 1-3.

Bauer, R. Frijns, B., Otten, R. & Tourani-Rad, A. (2008). The impact of corporate governance on corporate performance: evidence from Japan. *Pacific-Basin Finance Journal*, (16), 236-251.

Baysinger, B. & Butler, H. (1985). Corporate governance and the board of directors: Performance effects of changes in board composition. *Journal of Law, Economics and Organization,* 1, 101-134.

Baysinger, B. & Hoskisson, R. E. (1990). The composition of boards of directors and strategic control effects on corporate strategy. *Academy of Management Review*, 15 (1), 72-87.

Beasley, M. S. (1996). An empirical analysis of the relation between the board of directors' composition and financial statement fraud. *The Accounting Review,* 2 (October), 443 – 465.

Beaver, W. (1998). *Financial reporting: an accounting revolution.* (3rd Edition). Upper Saddle River, NJ: Prentice Hall.

Beiner, S. & Schmid, M. (2005). *Agency conflicts, corporate governance, and corporate diversification; evidence from Switzerland.* SSRN, Available at http://papers.ssrn.com/so13/papers.cfm? Abstract id=666264#papersdownload.

Bennedsen, M., Kongsted, H. C. & Nielsen, K. M. (2004). *Board size effects in closely held corporations.* CAM Institute of Economics. University of Copenhagen Working Papers, 25.

Berger, P. G., Ofek, E. & Yermack, D. L. (1997). Managerial entrenchment and capital structure decisions. *The Journal of Finance,* (52), 1411-1438.

Berghe, L.V. & Ridder, L.D. (1999). *International standardization of good corporate governance: best practices for the board of directors*. Boston: Kluwer Academic Publishers.

Berle, A. & Means, G. (1932). *The modern corporation and private property*. Macmillan. New York

Bhagat, S. & Black, B. (1999). The uncertain relationship between board composition and firm performance. *The Business Lawyer*, 54(3), 921-963.

Bhagat, S. & Black, B. (2002). The non-correlation between board independence and long term firm performance. *Journal of Corporation Law*, 27, 231 – 254.

Bhagat, S. & Bolton, B. (2005). *Corporate governance and firm performance.* Working Paper No. 17-2005. University of Colorado.

Bhagat, S. & Jefferis, R. (2002). *The econometrics of corporate governance studies.* MIT Press Cambridge.

Bhagat, S., Carey, D. & Elson, C. (1999). Director's ownership, corporate performance, and management turnover. *Business Law*, 885.

Bishop, S., Faff, R., Oliver, B. & Twite, G. (2004). *Corporate finance.* (5th Edition). Prentice Hall, Sydney.

Black, B. & Khanna, V. (2007). Can corporate governance reforms increase firms' market values? Event study evidence from India. *Journal of Empirical Legal Studies,* (4), 749-796.

Black, B. (2001). Does corporate governance matter? A crude test using Russian data. *University of Pennsylvania Law Review,* 149(2), 2131-2150.

Black, B., Gledson-de-Carvalho, A. & Gorga, E.C.R. (2010). Corporate governance in Brazil. *Emerging Markets Review*, (11), 21-38.

Black, B., Gledson-de-Carvalho, A. & Gorga, E.C.R. (2012).What matters and for which firms for corporate governance in emerging markets? Evidence from Brazil (and other BRIK countries). *Journal of Corporate Finance,* (18), 934-952.

Black, B., Gledson-De-Carvalho, A., Khanna, V., Kim, W. & Yurtoglu, B. (2013). *What aspects of corporate governance appear to create value in emerging markets?* Working Paper. Available at http://ssrn.com/abstract=2227718.

Black, B., Jang, H. & Kim, W. (2006). Does corporate governance affect firms' market values? Evidence from Korea. *Journal of Law, Economics and Organization, (*22), 366-413.

Bohren, O. & Odegaard, B. (2001). Corporate governance and economic performance: A closer look, *The Norwegian School of Management.* Working Paper.

Bolton, P. & Von-Thadden, E. L. (1998). Blocks, liquidity, and corporate control. *Journal of Finance*, 53(1), 1-25.

Bonn, I. (2004). Board structure and firm performance: Evidence from Australia. *Journal of the Australian and New Zealand Academy of Management,* 10(1), 14.

Bonn, I., Yoshikawa, T. & Phan, P. H. (2004). Effects of board structure on firm performance: A comparison between Japan and Australia. *Asian Business & Management*, 3, 105-125.

Boone, A., Field, L., Karpoff, J. & Raheja, C. (2007).The determinants of corporate board size and composition: an empirical analysis. *Journal of Financial Economics,* (85), 66-101.

Bose, S. (2004). *A valuation process for intellectual property in a technology park environment.* (Unpublished DBA, Thesis). Victoria University, Melbourne.

Brailsford, T. J., Oliver, B. R. & Pua, S. L. H. (2002). On the relation between ownership structure and capital structure. *Accounting & Finance*, (42), 1-26.

Brennan, M. J. & Schwartz, E. S. (1985). Evaluating natural resources investments. *Journal of Business,* 58(2), 135-137.

Breuer, R. (1999). Corporate governance in a global corporation. *Directorship,* (25), 1-3.

Brickley, J., Coles, J. & Terry, R., (1994). Outside directors and the adoption of poison pills. *Journal of Financial Economics,* (35), 371-390.

Brown, L. D. & Gorgens, T. (2009). Corporate governance and financial performance in an Australian context. *Treasury Working Paper 2009 – 02*. The Australian Treasury/Australian National University.

Burke, R. (2000). Company size, board size and the number of women corporate directors. Burke, R. & Mattis, M. (ed). *Women on corporate boards of directors*. Netherlands 157-167, Khiwer Academic Publishers.

Byrd, J. & Hickman, K. (1992). Do outside directors monitor managers? Evidence from tender offer bids. *Journal of Financial Economics,* 32(2), 195-221.

Campbell, K. & Minguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, 83, 435-451.

Capulong, V., Edwards, D., Webb, D. & Zhuang, J. (2000). *Corporate governance and finance in East Asia: A study of Indonesia, Republic of Korea, Malaysia, Philippines and Thailand.* Asian Development Bank, (1), Manila.

Carter, D. A., D'Souza, F., Simkins B. J. & Simpson, W. G. (2010). The Gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review, 18(5), 396-414.*

Carter, D. A., Simkins, B. J. & Simpson, W. G. (2003). Corporate governance, board diversity and firm value. *Financial Review,* 38(1), 33-53.

Cassey, K. M. & Anderson, D. C. (1999). Examining the impact of the tax reform act on corporate dividend policy: A new methodology. *Journal of Financial Review,* 34(3), 17-28.

Chaganti, R., Mahajan, V. & Sharma, S. (1985). Corporate board size, composition and corporate failures in retaining industry. *Journal of Management Studies*, (22), 400-416.

Choi, B., Collins, D. & Johnson, W. (1997).Valuation implications of reliability differences: The case of non-pension post-retirement obligations. *The Accounting Review,* (72), 351-383.

Chong, A. & Lopez-De-Silanes, F. (2006). *Corporate governance in Latin America.* Inter-American Development Bank Research Paper No.591, 1-81.

Chua, C., Eun, C. & Lai, S. (2007). Corporate valuation around the world: the effects of governance, growth, and openness. *Journal of Banking and Finance,* (31), 35-36.

Chukwu, I. (2002). Crude oil development. *The Post Expresses*, 24-25. October, 1

Chung, K. H. & Pruitt, S. W. (1994). A simple approximation of Tobin's Q. *Financial Management,* 23(3), 70-74.

Coles, J. L., Daniel, N. & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics,* (87), 329-356.

Daily, C. M. & Dalton, D. R. (1992). Bankruptcy and corporate governance: The impact of board composition and structure. *Academy of Management Journal*, 37(6), 1603-1617.

Daily, C. M. & Dalton, D. R. (1993). The relationship between governance structure and corporate performance in entrepreneurial firms'. *Journal of Business Venturing*, 7(5), 375-386.

Daily, C. M. & Ellstrand, A. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22(3), 409 – 418.

Daily, C. M. & Johnson, J. (1997). Sources of CEO power and firm financial performance: A longitudinal assessment. *Journal of Management*, 23(2), 97-117.

Daily, C. M., Dalton, D. R. & Canella, A. A. (2003). Corporate governance: Decades of dialogue and data. *Academy of Management Review*, 28(3), 371–382.

Dalton, C. M. & Dalton, D. R. (2005). Boards of directors: Utilizing empirical evidence in developing practical prescriptions. *British Journal of Management,* 16, 91-97.

Dalton, D. R., Daily, C. M., Ellstrand, A. & Johnson, J. (1998). Meta-analytic review of board composition, leadership structure and financial performance. *Strategic Management Journal*, 19, 269.290.

Dalton, D. R., Daily, C. M., Jonathan L. J. & Alan E. E. (1999). Number of directors and financial performance: A meta-analysis. *The Academy of Management Journal,* (42), 674-686.

Dang, R., Nguyen, D. K. & Vo, L. C. (2012). *Women on corporate boards and firm performance: A comparative study.* A Working Paper.

Darmadi, S. (2011). Board diversity and firm performance: The Indonesian evidence. *Corporate Ownership and Control Journal*, 8, Available at http://ssrn.com/abstract=1728572.

David, A. C., Frank, D., Betty J. S. & Simpson, W. G. (2010). The gender and ethnic diversity of us boards and board committees and firm financial performance. C*orporate Governance: An International Review*, 18(5), 396-414.

Davies, J. H., Hillier, D. & McColgan, P. (2005). Ownership structure, managerial behavior and corporate value. *Journal of Corporate Finance*, (11), 645-660.

Dedman, E. (2000). An investigation into the determinants of UK board structure before and after Cadbury. *Corporate Governance,* 8, 133 – 153.

Demsetz, H. & Lehn, K. (1985). The structure of corporate ownership: causes and consequences. *Journal of Political Economy*, 93(6), 1155-1177.

Dewi, N. H. U. (2012). Corporate governance in the effort of increasing the company's value. *Journal of Economics, Business and Accountancy Ventura*. 15(2). 331 – 342.

Drobetz, W., Schillhofer, A. & Zimmermann, H. (2004). Corporate governance and expected stock returns: Evidence from Germany. *European Financial Management*, (10), 267–293.

Dulewicz, V. & Herbert, P. (2004). Does the composition and practice of boards and directors bear any relationship to the performance of their companies? *An International Review*, 12(3), 263-280.

Easton, P. & Harris, T. (1991). Earnings as an explanatory variable in returns. *Journal of Accounting Research*, 19-36.

Eisenberg, T. Sundgren, S. & Wells, M. (1998). Large board size and decreasing firm value in small firms. *Journal of Financial Economics*, 48(1), 35-54.

Erhardt, N. L., Werbel, J. D. & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate Governance*: *An International Review*, 11(2), 102-111.

Fama, E. & Jensen, M. (1983). Separation of ownership and control. *Journal of Law and Economics,* 26(2), 301-325.

Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy,* 88, 288-307.

Farrell, K. A. & Hersch, P. L. (2005). Additions to corporate boards: the effect of gender. *Journal of Corporate Finance,* 11(1-2), 85-106.

Federal Republic of Nigeria (2003, 2008). *Code of Corporate Governance.* Security and Exchange Commission. (NSE).

Federal Republic of Nigeria (2008). *Report on the Observance of Standards and Code* (ROSC) *Benchmarks.* Nigerian Stock Exchange. (NSE).

Fernandez-Rodriguez, E. S., Gomez-Anson & Cuervo-Garcia, A. (2004). The stock market reaction to the introduction of best practices codes by Spanish firms' corporate governance: *An International Review*, 12(1), 29-45.

Friend, I. & Lang, L. H. P. (1988). An empirical test of the impact of managerial self-interest on corporate capital structure. *Journal of Finance*, (43), 271-281.

Garba, T. & Abubakar, B. A. (2014). Corporate board diversity and financial performance of insurance companies in Nigeria: An application of panel data approach. *Asian Economic and Financial Review*, 4(2), 257-277.

Gillan, S. L. (2006). Recent developments in corporate governance: An overview. *Journal of Corporate Finance*, 12. 381 – 402.

Gompers, P., Ishii, J. & Metrick, A. (2003). Corporate governance and equity prices. *Quarterly Journal of Economics,* (188), 107-155.

Grzybkowski, M. & Dariusz, W. (2006). *Internet and corporate governance.* Working Paper. University Of Oxford. Retrieved at http://ssrn.com

Gujarati, D. N. (2004). *Basic econometrics*. (4th Edition). McGraw-Hill, USA.

Gul, F. & Leung, S. (2004). Board leadership, outside directors' expertise and voluntary corporate disclosure. *Journal of Accounting and Public Policy*, 23(5), 351 – 379.

Gupta, A., Otley, D. & Young, S. (2008). Does superior firm performance lead to higher quality outside directorship? *The Accounting, Auditing and Accountability Journal,* 1(7), 907–932.

Habbash, M. (2010). *The effectiveness of corporate governance and external audit on constraining earnings management practice in the U.K.* (Doctoral Thesis). Durham University. Available at Durham E-Thesis online http://etheses.dur.ac.uk/448.

Heinrich, R. (2002). *Complementaries in corporate governance*. Springer, Berlin.

Hermalin, B. & Weisbach, B. (2003). *Boards of directors as an endogenously determined institution: a survey of the economic literature*. Federal Reserve Bank of New York Economic Policy Review.

Hermalin, B. & Weisbach, M. S. (1991). The effects of board composition and direct incentives on firm performance. *Financial Management,* 20(4), 101-112.

Hillman, A. J., Cannella, A. & Paetzold, R. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37, 235-256.

Holderness, C. G. & Shechan, D. (1988). The role of majority shareholders in publicly held corporations: an exploratory analysis. *Journal of Financial Economics*, (20), 317-346.

Holmström, B. & Tirole, J. (1983). Market liquidity and performance monitoring. *Journal of Political Economy*, (101), 678-709.

Hussein, K. & Kiwia, B. (2009). Examining the relationship between female board members and firm performance-A panel study of US firms. *African Journal of Finance and Management.*

James, C. M., (1984). An analysis of the effect of state acquisition laws on managerial efficiency: The case of banking. *Journal of Political Economy,* (95), 355-370.

Jensen, M. & Meckling, W. (1976). Theory of the firm: Management behavior, agency costs, and ownership structure. *Journal of Financial Economics*, (3), 305-360.

Jensen, M. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance,* 48(3), 831-880.
Journal of Banking & Finance, 37, 1573–1589.
Kallunki, J. & Martikainen, T. (1997). The lead-lag structure of stock returns and accounting earnings. *International Review of Financial Analysis*, 6(1), 37-48.
Karpoff, M., Marr, M. & Danielson, M. (2000). *Corporate governance and firm performance.* Blackwell Publishers, Massachusetts.
Kim, J., Krinsky, I. & Lee, J. (1997). Institutional holdings and trading volume reactions to quarterly earnings announcements. *Journal of Accounting, Auditing and Finance*, 1-14.
Klapper, L. & Love, I. (2004). Corporate governance, investor protection and performance in emerging markets. *Journal of Corporate Finance*, 10(5), 703-728.
Klein, A. (1998). Firm performance and board committee structure. *Journal of Law and Economics,* 41, 275-303.
Kyereboah-Coleman, A. & Biekpe, N. (2005). *The relationship between board compositions, CEO duality and firm performance: experience from Ghana.* Working Paper. University of Stellenbosch Business School, Cape Town.
Leech, D. & Leahy, J. (1991). Ownership structure, control type classification and the performance of large British companies. *The Economic Journal*, 101, 1418-1438.
Lehmann, E. & Weigand, J. (2000). Does the governed corporate perform better? Governance structures and corporate performance in Germany. *European Finance Review,* 4, 157-195.
Lehn, K., Patro, S. & Zhao, M. (2009). Determinants of the size and composition of United States of America corporate boards: 1935-2000. *Financial Management,* 38(4), 747.
Lev, B. (1988). Towards a theory of equitable and efficient accounting policy. *The Accounting Review*, 1-22.
Linck, J. S., Netter, J. M. & Yang, M. (2008). The determinants of board structure. *The Journal of Financial Economics,* 87(2), 308-328.
Lipton, M. & Lorsch, J. (1992). A modest proposal for improved corporate governance. *Business Lawyer,* 48(1), 59-77.
Loderer, C. & Peyer, U. (2002). Board overlap, seat accumulation and share prices? *European Financial Management,* 8(2), 165-192.
Mak, Y. T. & Li, Y. (2001). Determinates of corporate ownership and board structure: Evidence from Singapore. *Journal of Corporate Finance*, 7, 235 – 256.
Mak, Y. T. & Yuanto, K. (2003). Board size really matters: Further evidence on

the negative relationship between board size and firm value. *Journal of Corporate Finance*, 5, 145 – 166.

Mallette, P. & Fowler, K. (1992) Effects of board composition and stock ownership on the adoption of poison pills. *Academy of Management Journal*, 35, 1010-1035.

Mallin, C. (2002). The relationship between corporate governance, transparency and financial disclosures. *International Review Journal,* 10(4), 253 – 255.

Man, C. S. & Kong, T. T. (2011). *Gender diversity and firm financial performance: Evidence from Hong Kong*. University, Hong Kong.

Manas, M. & Saravanan, P. (2006). Does the board size really matter? An empirical investigation on the Indian banking sector. *Journal of Corporation Law*, 7(2), 231 – 243.

Mathiason, N. (2006, January 29). *Oil delta burns with hate.* (The Observer, UK). Available at http//observer. guardian.co.uk/business.

Mbendi, K. (2014). *Nigeria oil and gas reserves*. Retrieved from www.mbendi.com/oilg/af/ng/p0005.htm

McConnell, J. & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial of Economics*, 27, 595-613.

Miguel, A. D., Pindado, J. & Torre, C. D. l. (2004). Ownership structure and firm value: new evidence from Spain. *Strategic Management Journal,* 25, 1199-1207.

Milliken, F. J. & Martins, L. L. (1996). Searching for common threads: understanding the multiple effects of diversity in organizational groups. *The Academy of Management Review*, 21(2), 402-433.

Millstein, I. & MacAvoy, P. (1998). The active board of directors and performance of the large public traded corporations. *Columbia Law Review*, 98, 1283-1321.

Morck, R., Shlieifer, A. & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics,* 20, 347-376.

Neter, J., Kutner, M. H., Nachtsheim, C. J. & Wasserman, W. (1996). *Applied linear statistical models*. Irwin Company Inc. Chicago, U.S.A.

Novaes, W. & Zingales, L. (1995). Capital structure choice when managers are in control: entrenchment versus efficiency. *The Journal of Business*, 76, 49-81.

Nuryaman, N. (2012). The influence of corporate governance practices on the companies' financial performance (Studies on the companies survey by IICG and listed on the Indonesian Stock Exchange). *Journal of Global Business and Economics*, 5(1), 1 – 17.

Oba, V. C. (2013). Boards' gender mix as a predictor of financial performance in

Nigeria: An empirical study. *Journal of Economics and Finance*, 5(2), 170-178.

Ohlson, J. (1995). Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research,* 11, 661-687.

Park, H. M. (2011). Practical guides to panel data modeling: A step by step analysis using Stata. International University of Japan Public Management and Policy Analysis Program. Available at http://www.iuj.ac.jp/faculty/kucc625

Pathan, S. & Faff, R. (2013). Does board structure in banks really affect their performance?

Pearce, J. & Zahra, S. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29(4), 411-438.

Peng, M. W. (2004). Outside directors and firm performance during institutional transitions. *Strategic Management Journal*, 25(5), 435-471.

Penman, S. (1980). An empirical investigation of the voluntary disclosure of corporate earnings forecasts. *Journal of Accounting Research*, 132-160.

Pfeffer, J. & Salancik, G. R. (1978). *The external control of organization: A resource dependency perspective*, New York: Harper and Row.

Pfeffer, J. (1972). Size, compensation, and function of hospital boards of directors? *Administrative Science Quarterly,* 18, 349-364.

Post, C. & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*. Retrieved from doi:10.5465/amj.2013.0319

protection or expropriation? *Journal of Business Finance & Accounting, 35*(5), 648-667.

Raheja, C. G. (2005). Determinants of board size and composition: A theory of corporate boards. *The Journal of Financial and Quantitative Analysis,* 40, 283-306.

Randoy, T. & Jenssen, J. I. (2004). Board independence and product market competition in Swedish firms. *Corporate Governance: An International Review*, 12, 281-289.

Randoy, T., Thomsen, S. & Oxelheim, L. (2006). A Nordic perspective on corporate board diversity. Working Paper. Available at http://www.nordicinnovation.net/_img/a_nordic_perspective_on_board_diversity_finalweb.pdf

Rhode, D. L. & Packel, A. K. (2010). Diversity on corporate boards: how much difference does difference make? Working Paper. Available at http://ssrn.com/abstract=1685615.

Robinson, G. & Dechant, K. (1997). Building a business case for diversity. *Academy of Management Executive*, 11, 21-31.

Rosenstein, S. & Wyatt, J. H. (1997). Outside directors, board effectiveness and

shareholders wealth. *Journal of Financial Economies*, 26(3), 165 – 180.

Ruan, W., Tian, G. & Ma, S. (2009). *Managerial ownership, capital structure and firm value.* Working paper.

Sanda, A., Mikailu, A. S. & Garba, T. (2008). Board independence and firm financial performance: Evidence from Nigeria. A Paper Presented at the Center for the Study of African Economics Conference, University of Oxford.

Sarkar, J. & Sarkar, S. (2000). *Indian development report.* Indira Gandhi Institute of Development Research, Oxford University Press, New Delhi.

Schellenger, M. H., Wood, D. D. & Tashakori, A. (1989). Board of director composition, shareholder wealth and dividend policy. *Journal of Management*, 15, 457-467.

Shleifer, A. & Vishny, R. W. (1997). A survey of corporate governance. *Journal of Finance*, 52(2), 737-783.

Short, H. & Keasey, K. (1999). Managerial ownership and the performance of firms: Evidence from the U.K. *Journal of Corporate Finance,* 5, 79-101.

Shrader, C. B., Blackburn, V. B. & Iles, P. (1997). Women in management and firm financial performance: An exploratory study. *Journal of Managerial Issues,* 9(3), 355-372.

Silveira, A. D., Leal, R. P. C., Silva, A. L. C. & Barros, C. L. A. B. (2007). Evolution and determinants of firm-level corporate governance quality in Brazil. *R.Adm. Sao Paolo,* 44(3), 173-189.

Smith, N., Smith, V. & Verner, M. (2006). Do women in top management affect firm performance? A panel study of 2,500 Danish firms. *International Journal of Productivity and Performance Management,* 55(7), 569-593.

Tobachnick, B. G. & Fidell, L. S. (1996). *Using multivariate statistics.* (3rd Edition), Harper Collins, New York, U.S.A.

Tsegba, I. & Ezi-Herbert, W. (2011). The relationship between ownership structure and firm performance: Evidence from Nigerian listed companies. *African Journal of Accounting, Economics, Finance and Banking Research*, 7(7).

Tsegba, I., Herbert, W. & Ene, E. (2014). Corporate ownership, corporate control and corporate performance in Sub-Saharan African: Evidence from Nigeria. . *International Business Research, 73.*

Vafeas, N. (1999). Board meeting frequency and firm performance. *Journal of Financial Economics,* 53, 113-42.

Wagner, J., Stimpert, J. & Fubara, E. (1998). Board composition and organizational performance: Two studies of insider/outsider effects. *Journal of Management Studies*, 35(5), 655-677.

Wang, D. (2006). Founding family ownership and earnings quality. *Journal of Accounting Research,* 44, 619-656.

Wang, Y., Chuang, C. & Lee, S. (2010). Impact of compositions and characteristics of board of directors and earnings management on fraud. *African Journal of Business Management,* 4, 496-511.

Wectman, P. (2003). *Financial Accounting*: An Introduction, (3rd Ed). Harlow, Pearson Education, London.

Wei, Z., Xie, F. & Zhang, S. (2005). Ownership structure and firm value in china's privatized firms: 1991-2001. *Journal of Financial and Quantitative Analysis,* 40, 87-108.

Weir, C., Laing, D. & McKnight, P. J. (2001). An empirical analysis of the impact of corporate governance mechanisms on the performance of UK firms. Working paper, Available at http://www.ssrn/awwfc.com.

Weisbach, M. & Hermalin, B. (2003). Boards of directors as an endogenously determined institution: A Survey of the Economic Evidence. *Economic Policy Review*, 9, 7-26.

Weisbach, M. (1988). Outside directors and CEO turnover. *Journal of Financial Economics,* 20, 431-460.

Wild, J. J. (1992). Stock price informativeness of accounting numbers: Evidence on earnings, book values and their components. *Journal of Accounting and Public Policy,* 11, 119-154.

Xie, B., Davidson, W. & DaDalt, P. (2003). Earnings management and corporate governance: the roles of the board and the audit committee. *Journal of Corporate Finance,* 9(3), 295-317.

Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics,* 40(2), 185-211.

Yi, W. & Bob, C. (2009). Is there a business case for board diversity? *Pacific Accounting Review,* 21(2), 88–103.

Zahra, S. A. & Pearce, J. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-244.

Zahra, S. A. & Stanton, W. W. (1988). The implications of board of directors' composition for corporate strategy and performance. *International Journal of Management*, 5, 229–236.

Zhou, J. & Chen, K. Y. (2004). *Audit committee, board characteristics and earnings management by commercial banks.* Online at http://www.papers.ssrn.com/so13/Delivery.cfm

```
. edit

. *(8 variables, 48 observations pasted into data editor)

. xtset id year, yearly
       panel variable:  id (strongly balanced)
        time variable:  year, 2008 to 2015
                delta:  1 year

.
. summarize tobin_q bind bosz bogd ownc mshd
```

Variable	Obs	Mean	Std. Dev.	Min	Max
tobin_q	48	2.807083	2.386506	.28	10.01
bind	48	.53125	.2008982	.25	.9
bosz	48	9	3.457954	5	16
bogd	48	.8125	.6069193	0	2
ownc	48	55.29792	18.52407	18.58	74.4
mshd	48	.3708333	.274411	.1	.9

```
. swilk  tobin_q bind bosz bogd ownc mshd
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
tobin_q	48	0.83342	7.587	4.311	0.00001
bind	48	0.93836	2.808	2.196	0.01404
bosz	48	0.94566	2.475	1.928	0.02694
bogd	48	0.97764	1.019	0.039	0.48444
ownc	48	0.86863	5.983	3.806	0.00007
mshd	48	0.89350	4.850	3.359	0.00039

```
. correlate  tobin_q bind bosz bogd ownc mshd
(obs=48)
```

	tobin_q	bind	bosz	bogd	ownc	mshd
tobin_q	1.0000					
bind	-0.2956	1.0000				
bosz	-0.3016	-0.4661	1.0000			
bogd	0.1894	-0.5791	0.7097	1.0000		
ownc	0.3200	0.2953	-0.5972	-0.4567	1.0000	
mshd	-0.3153	0.4121	-0.3924	-0.5062	-0.1455	1.0000

```
. regress  tobin_q bind bosz bogd ownc mshd
```

Source	SS	df	MS		
Model	152.212299	5	30.4424597	Number of obs =	48
Residual	115.472096	42	2.74933561	F(5, 42) =	11.07
				Prob > F =	0.0000
Total	267.684394	47	5.69541264	R-squared =	0.5686
				Adj R-squared =	0.5173
				Root MSE =	1.6581

tobin_q	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bind	-3.773971	1.514743	-2.49	0.017	-6.830846	-.7170947
bosz	-.593136	.1174043	-5.05	0.000	-.8300676	-.3562045
bogd	2.208206	.6615727	3.34	0.002	.8730984	3.543314
ownc	.0161277	.0200305	0.81	0.425	-.0242955	.0565508
mshd	-1.90547	1.274769	-1.49	0.142	-4.478058	.667118
_cons	8.170848	2.394164	3.41	0.001	3.33923	13.00247

```
. estimates store OLS



. estat hettest

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

         chi2(1)      =    12.04
         Prob > chi2  =   0.0005

. estat vif
```

Variable	VIF	1/VIF
bosz	2.82	0.354914
bogd	2.76	0.362838
ownc	2.35	0.424888
mshd	2.09	0.478040
bind	1.58	0.631683
Mean VIF	2.32	

```
. xtreg tobin_q bind bosz bogd ownc mshd, fe

Fixed-effects (within) regression               Number of obs      =        48
Group variable: id                              Number of groups   =         6

R-sq:  within  = 0.2032                         Obs per group: min =         8
       between = 0.9241                                        avg =       8.0
       overall = 0.5300                                        max =         8

                                                F(5,37)            =      1.89
corr(u_i, Xb)  = 0.6375                         Prob > F           =    0.1202

------------------------------------------------------------------------------
     tobin_q |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        bind |   -3.22388   3.130801    -1.03   0.310    -9.567486    3.119726
        bosz |  -.3299122   .3068137    -1.08   0.289    -.9515757    .2917513
        bogd |   1.806558   .7865936     2.30   0.027     .212768    3.400348
        ownc |   .0201409   .1098043     0.18   0.855    -.2023438    .2426256
        mshd |  -.3791936   2.062141    -0.18   0.855    -4.557488    3.799101
       _cons |   5.048017   7.540182     0.67   0.507    -10.22984    20.32588
-------------+----------------------------------------------------------------
     sigma_u |  .86297902
     sigma_e |  1.7094496
         rho |   .2030932   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(5, 37) =     0.50              Prob > F = 0.7720

. estimates store Fixed_effects
```

```
. xtreg tobin_q bind bosz bogd ownc mshd, re

Random-effects GLS regression                   Number of obs      =        48
Group variable: id                              Number of groups   =         6

R-sq:  within  = 0.1908                         Obs per group: min =         8
       between = 0.9916                                        avg =       8.0
       overall = 0.5686                                        max =         8

                                                Wald chi2(5)       =     55.36
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     tobin_q |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        bind |  -3.773971   1.514743    -2.49   0.013    -6.742813   -.8051281
        bosz |   -.593136   .1174043    -5.05   0.000    -.8232443   -.3630278
        bogd |   2.208206   .6615727     3.34   0.001     .9115475    3.504865
        ownc |   .0161277   .0200305     0.81   0.421    -.0231314    .0553867
        mshd |   -1.90547   1.274769    -1.49   0.135    -4.403971    .5930313
       _cons |   8.170848   2.394164     3.41   0.001     3.478373    12.86332
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  1.7094496
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. stimates store Random_effects
unrecognized command:  stimates
r(199);

. estimates store Random_effects
```

```
. hausman Fixed_effects Random_effects
```

	Coefficients (b) Fixed_effe~s	(B) Random_eff~s	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
bind	-3.22388	-3.773971	.5500905	2.739976
bosz	-.3299122	-.593136	.2632238	.2834622
bogd	1.806558	2.208206	-.401648	.425501
ownc	.0201409	.0161277	.0040133	.1079619
mshd	-.3791936	-1.90547	1.526276	1.620922

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 2.43
Prob>chi2 = 0.7867

Breusch and Pagan Lagrangian multiplier test for random effects

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

Estimated results:

	Var	sd = sqrt(Var)
tobin_q	5.695413	2.386506
e	2.922218	1.70945
u	0	0

Test: Var(u) = 0

chibar2(01) = 0.00
Prob > chibar2 = 1.0000

```
. regress tobin_q bind bosz bogd ownc mshd, vce(robust)

Linear regression                               Number of obs =      48
                                                F(  5,    42) =   10.95
                                                Prob > F      =  0.0000
                                                R-squared     =  0.5686
                                                Root MSE      =  1.6581
```

tobin_q	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
bind	-3.773971	1.367777	-2.76	0.009	-6.534256	-1.013685
bosz	-.593136	.1272852	-4.66	0.000	-.850008	-.3362641
bogd	2.208206	.6344593	3.48	0.001	.9278153	3.488597
ownc	.0161277	.0193226	0.83	0.409	-.0228669	.0551222
mshd	-1.90547	1.061764	-1.79	0.080	-4.048196	.2372567
_cons	8.170848	2.550464	3.20	0.003	3.023804	13.31789

```
. estimates store OLS_robust

. estimates table OLS Fixed_effects Random_effects OLS_robust, stats(chi2 df N) star(.10 .05 .001) style(oneline)
```

Variable	OLS	Fixed_effects	Random_effe~s	OLS_robust
bind	-3.7739705**	-3.2238801	-3.7739705**	-3.7739705**
bosz	-.59313604***	-.32991222	-.59313604***	-.59313604***
bogd	2.2082061**	1.806558**	2.2082061***	2.2082061**
ownc	.01612766	.02014093	.01612766	.01612766
mshd	-1.9054698	-.37919355	-1.9054698	-1.9054698*
_cons	8.1708482**	5.0480174	8.1708482***	8.1708482**
chi2			55.363302	
df				
N	48	48	48	48

legend: * p<.1; ** p<.05; *** p<.001