Intellectual capital disclosure and corporate market value: does board diversity matter?

Mutalib Anifowose, Hafiz Majdi Abdul Rashid and Hairul Azlan Annuar
Department of Accounting, International Islamic University Malaysia, Kuala Lumpur, Malaysia

Abstract

Purpose – The purpose of this paper is to examine the relationship between IC disclosure and the corporate market value (CMV) of listed firms on the main board of Nigeria Stock Exchange and to test the moderating effect of religious and ethnic composition of board members on the relationship.

Design/methodology/approach – This study applies the signaling and upper echelons theories in formulating four hypotheses that guide the results analysis. By employing a two-step dynamic system generalized method of moments and controlling for the possible endogeneity effect on the parameters estimated for a sample of 91 listed firms on main board of Nigeria Stock Exchange, this study investigates the association of IC disclosure with CMV, namely, cost of capital and market capitalization, and the moderating role of religious and ethnic composition on such association using data over the 2010 to 2014 financial years.

Findings – The results show a significant positive relationship between overall IC disclosure and market capitalization and a negative impact on cost of capital, which are in line with the hypothesized propositions. The moderating effect of board diversity is also confirmed. This study contributes to recent evidence concerning the value relevance of IC information to investors and other interested stakeholders and the established moderating role of board diversity in IC disclosure-related studies.

Practical implications – The regulators may consider development of standards on board composition about religious and ethnic composition in order to curb the domination from same group in the board room. Those charged with governance should be concerned with the disclosure of IC information in the financial statements as it has value relevance to the investors, in line with signaling theory.

Social implications – The ethnic and religious composition of board members is a significant factor within the board room and needs to be given adequate consideration.

Originality/value – This study is the first to consider IC disclosure across whole sectors in the Nigerian economy and looks upon ethnicity and religious affiliation of boards as moderating variables. The study controls for heteroscedasticity and endogeneity issues by adopting two-step dynamic system generalized method of moments.

Keywords Nigeria, Cost of capital, Market capitalization, Ethnic diversity, IC disclosure, Religious diversity

Paper type Research paper

Introduction

Business executives, shareholders, financial markets, regulatory bodies and other stakeholders rely on the provision of reliable, quality, "value-relevant" information for effective and efficient decision making about resources allocation, risk diversification and policy formulation and implementation (Zhou *et al.*, 2015). The level of information provided by corporate entities benefits not only the organization itself but also the investors, creditors and other known and unknown stakeholders. Thus, the basic aim of corporate annual accounts and reports is to satisfy the information requirements of various stakeholders in a way that enhances decision making and ensures adequate stewardship (e.g. Black and Maggina, 2016; Eccles *et al.*, 2002; Firer and Williams, 2003; Guthrie and Petty, 2000; Watson *et al.*, 2002).

The traditional financial reporting framework has been considered insufficient in addressing the information needs of stakeholders as its value, examined by the relationship between financial data and corporate value, has plummeted in past decades (e.g. Bozzolan *et al.*, 2003; Francis and Schipper, 1999; Lev and Zarowin, 1999). This has

Journal of Accounting in Emerging Economies
Vol. 7 No. 3, 2017
pp. 369-398

2042-1168
DOI 10.1108/JAEE-06-2015-0048

created a significant gap between the corporate book and market values in terms of the random walk theory, in which the two values should be approximately equal (Van Horne and Parker, 1967).

Prior studies have attributed this difference to corporate resources capital that fails to meet the recognition benchmarks of financial reporting framework and are therefore hidden in traditional financial statements (Bontis, 2001; Brennan and Connell, 2000; Carroll and Tansey, 2000; Lev, 2000; Luthy, 1998; Stewart and Ruckdeschel, 1998; Sullivan, 2000). This hidden value has generally been referred to as "intellectual capital" (Bontis, 1996; Edvinsson, 1997; Hudson, 1993; Roos and Roos, 1997; Roos, 1998). The intellectual capital concept is drawn from several fields of study, but from a financial accounting and reporting perspective it has been defined as "non-monetary assets or resources without physical substance, such as innovation, knowledge, research and development, employee training or customer satisfaction, underlying a firm's value creation process" (Lev and Zambon, 2003; Marr and Schiuma, 2001; Meritum, 2002).

Corporate value is the concern of various stakeholders as it impacts not only present decision making but also future estimations in financing and investing decisions (Keeney and Keeney, 2009). Corporate market value (CMV) is considered as stock market value of a corporate entity (Ittner and Larcker, 1998) and this could be improved by disclosure of intellectual capital as this will ensure capital market efficiency and improve information symmetry between managers and investors (Abeysekera, 2008; Abhayawansa and Abeysekera, 2008) by signaling the future direction of firms to the users as stated by signaling theory (Anam *et al.*, 2011; Morris, 1987).

Research in accounting and finance has mostly considered CMV using different surrogates such as Tobin's *Q* (e.g. Bharadwaj *et al.*, 1999; Megna and Klock, 1993), market capitalization (e.g. Abdolmohammadi, 2005), share price (e.g. Gamerschlag, 2013; Sang and Taylor, 2014) and cost of capital (Botosan and Plumlee, 2002; Kristandl and Bontis, 2007).

Considering the nature of the present study, Tobin's *Q* is an inadequate measure of CMV since it requires a replacement cost of assets as one of the fundamental components (e.g. Bharadwaj *et al.*, 1999; Lewellen and Badrinath, 1997), which might not be visible in a study involving as abstract a concept as intellectual capital. Absolute share prices are also a component of market capitalization. Accordingly, the study estimates CMV through market capitalization and cost of capital. While market capitalization reflects the objective value of companies without management manipulation, the cost of financing has recently become a major concern among listed firms in the country.

Similarly, earlier studies have classified IC into three components: human capital, structural capital and relational capital (e.g. Anam *et al.*, 2012; Bontis, 1996; Bounfour, 2003; Brooking, 1996; Edvinsson and Malone, 1997; Marr and Chatzkel, 2004). Human capital includes the competence, skill, experience and intellectual abilities of individual employees (Bounfour, 2002; Edvinsson and Malone, 1997; Roos *et al.*, 1997; Stewart, 1997). Customer (relational) capital, which is a transitional type of IC, is made up of knowledge in groups and networks of knowledge resources embedded within and derived from a link of relationship between organizations and customers (Edvinsson and Malone, 1997; Roos *et al.*, 1997; Stewart, 1997). Structural capital simply consists of processes, methods, brands, intellectual property structure and other intangibles owned by the entity but hidden in the statement of financial position (Bounfour, 2002; Brooking, 1996; Edvinsson and Malone, 1997; Stewart, 1997).

While these elements of human and relational capital are easily comprehensible, there is ambiguity in what constitutes structural capital. Thus, after a critical examination of existing literature and the economic environment of Nigeria, the present study further evaluates structural capital and proposes its categorization into three elements: innovation capital (e.g. Bontis *et al.*, 1999; Edvinsson and Malone, 1997; Joia, 2000), protected capital, otherwise known as intellectual property (e.g. Brooking, 1996; Edvinsson and Malone, 1997; Lynn, 1998)

and process capital (e.g. Hsu and Fang, 2009; Stewart, 1997). This approach might help in developing a scientific framework, which is still a major concern in IC accounting research.

Innovation capital is considered a direct consequence of a firm's culture and its capacity for creating new knowledge from existing knowledge (Chang, 2007; Joia, 2000). According to Brooking (1996), intellectual property is the legal means of safeguarding enterprise infrastructure assets; intellectual assets that are covered by legal protection are called "protected capital". Process capital is defined as workflow, operation processes, specific methods, business development plans, information technology systems, cooperative culture, etc. within business organizations (Hsu and Fang, 2009).

Despite the significance of the outcomes and empirical findings of previous investigations of the value relevance of IC, there are certain limitations to the value of such findings as the majority of empirical studies examining the value relevance of IC have relied on data obtained from first-world markets such as the USA, the UK, Australia and Germany (see e.g. Gamerschlag, 2013; Sang and Taylor, 2014; Vafaei *et al.*, 2011). Therefore, it is questionable whether these results can be extended and applied to other regions of the world, particularly to emerging markets such as Nigeria, where capital flow is limited, markets are less sophisticated, production is more labor intensive, and educational and professional resources are limited (e.g. Luo *et al.*, 2010; Douma *et al.*, 2006; Van Staden, 1998). As issues related to IC are crucially important and not exclusive to the developed environment, it is timely to examine IC issues in emerging economies such as Nigeria. For example, the importance of the various components of IC in different countries might be different. This leads to the need to run tests in various environments in order to provide an in-depth understanding of the importance of IC.

Moreover, the socio-cultural values of people influence a country's economic activities at both micro and macro levels and these differ between countries; those of developing countries such as Nigeria may differ from those of developed countries. As such, the findings from this study might add a different perspective to existing studies, which are mostly from the developed economies, and thus extend the frontier of knowledge in the IC research community.

Although, there are many studies on the concept of IC, the literature regarding Nigeria remains scant as there are few studies (e.g. Haji and Mubaraq, 2012; Ibikunle and Damagum, 2013; Mahamad and Salman, 2011; Okpala and Chidi, 2010; Salman *et al.*, 2012; Uadiale and Uwuigbe, 2011) that have researched IC. To demonstrate, Okpala and Chidi (2010) consider human capital accounting and conclude that human resource/capital accounting could be a significant factor for internal decisions by management and external decisions by investors in Nigeria. However, the study focused on only one component of IC without recognition of others such as relational and structural capital. Similarly, Mahamad and Salman (2011) and Haji and Mubaraq (2012) document a positive trend of IC disclosures in Nigeria. While the former considered all the listed firms, the latter limited their study to the banking industry. However, none of these studies considered the value relevance of the IC disclosure in the country, leaving a gap in literature regarding the Nigerian context. This gap gives rise to the first research question:

RQ1. To what extent does IC disclosure enhance the CMV of listed firms in Nigeria?

Nigeria like any other nation has put in place codes of corporate governance. The first is the Securities and Exchanges Commission code issued in 2003 for all listed firms. Without reservation, the number of codes issued since 2003 (SEC 3003, 2011: CBN 2006, 2014, PENCOM 2008 and NAICOM 2009) has shown the commitment of the country in ensuring sound corporate governance among registered firms, especially listed ones. However, the volatility of issuance over a couple of years also calls for concern. According to Ofo (2010, 2011) and Adebola (2010), the main flaw of most codes issued in the country is lack of domestication

to Nigeria's economic reality as they are mostly modeled on western countries, especially the "Anglo-American model" in attempts to encourage foreign investors into the country. The authors argue for consideration of Nigerian economic culture and value in the development of further codes of corporate governance in the country.

Following the argument of Ofo (2010, 2011) and Adebola (2010) and looking at the economic and political environment of the country, there are fundamental factors that have affected both business and social interactions and interrelation in the country recently. These are religious affiliation and ethnic belonging. These two factors are conspicuously absent from all codes issued so far but affect the appointment of boards of directors in the country and might in turn influence board room activities. Hence, ethnic and religious affiliations of members of boards of directors of listed firms in Nigeria are considered as possible surrogates of board diversity in the current study.

The upper echelons theory states that board room members play a significant role in investment and utilization of corporate strategic resources as well as communicating information to the users of financial statements (Hambrick, 2007). The diversity of a board is therefore expected to strengthen the association between the IC disclosure and CMV (if the diversity would be considered to enhance the sound CG) for sound corporate governance. Hence, the current study incorporates board diversity as a moderating factor on the relationship between IC disclosure and CMV and advances the second research question:

RQ2. What is the moderating effect of board diversity on the association between IC disclosure and CMV of listed firms in Nigeria?

To the best of our knowledge, this will be the pioneer study in examining the role of these variables on the relationship between IC disclosure and CMV in general and more specifically in the emerging economy of Nigeria. The findings from the data analyses using two-step dynamic system generalized method of moments, while controlling for the possibility of heteroscedasticity and endogeneity issues in the variables, indicate the value relevance of IC disclosure and its significant positive impact on the CMV of listed firms in Nigeria. The ethnic and religious composition of boards also has a significant impact on the relationship between IC disclosure and CMV during the period of this study.

The remaining part of the study is structured as follows: the second section discusses the literature review, theoretical framework and hypotheses, the third section considers methodology, while fourth and five sections present the data analysis and conclusion of the study, respectively.

Knowledge-based economy in Nigeria

Nigeria covers 923,768 square kilometers. With a population growth rate of approximately 2.5 percent annually, the country is considered the continent's most populous nation, with a population of approximately 174 million. Recent data places the Nigerian economy 22nd in the world, overtaking South Africa as the continent's largest economy after it overhauled its gross domestic product data for the first time in more than two decades. Moreover, the country has embarked on various reforms in order to transform and bring the economy to the global stage through deregulation, privatization and the Public Private Participation Scheme, among other measures. As a result of the series of economic reforms being embarked upon, there is evidence of dynamism in the Nigerian economy through shifting from its traditional product-based economy to a knowledge-based orientation and diversification approach (Ibikunle and Damagum, 2013), which indicates the significance of intellectual capital in the country. For instance, the deregulation of petroleum industry, series of reforms in the financial sectors (banking, insurance and real estate) in the country could be considered as development toward knowledge-based economy.

As part of what can be seen as recognition of the knowledge-related economy in the country, there are a number of pieces of legislation that have been put in place in order to encourage research and development, otherwise known as innovation, and intellectual property, otherwise known as protected capital. Legislation designed to protect not only Nigerians but also foreigners as part of globalization and economic liberalization in the country include the Trademarks Act 1965, the Design and Patent Act 1970 and the Nigerian Copyright Act (Amended) 1999. These laws prevent individuals and groups from copying or taking unfair advantage of the work or reputation of another and provide remedies where this arises. Definitely, giving importance to these two components cannot be underestimated in the Nigerian content as the country is an emerging economy and would encourage the domestic development by supporting local research and development and initiatives. As a result, the two components are considered as separate IC components.

Accounting and financial reporting in Nigeria

In 2003, the Nigerian Accounting Standard Board (NASB) Act was enacted to issue the Statements of Accounting Standards hereafter known as Statement of Accounting Standard (SAS). Since then, 31 accounting standards have been issued by NASB covering various treatment, recognition and disclosure of economic transactions among public companies in the country, most especially listed firms.

In the quest for economic growth and development, the local standards are considered inadequate for attracting foreign investors to the country. Consequently, the need to adopt the international standards issue by the International Accounting Standards Board became apparent and the country formally adopted IFRS in January 2012. The NASB issued SAS number 22 on research and development in 2006 and number 31 on intangible assets in 2011, marking the beginning of intellectual capital accounting in Nigeria. The recent adoption of IFRS has revived further consideration of the issue of IC disclosure in the country, as International Accounting Standard (IAS 38) stipulates that a company identify "an asset if future benefits are attributable to assets being directed to the entity and if the costs are credibly assessable".

In the same vein, IFRS 3 provides guidelines on the identification and valuation of intangible assets resulting from business combinations, considered as the opportunity for a practical application of the methods and tools proposed by the intellectual capital community. This opportunity is taken to examine the significance of IC models and minimize the gap between IC accounting and financial reporting (Petty and Guthrie, 2000; Roslender and Fincham, 2001). As a sequel to IFRS adoption in Nigeria, a new act, the Financial Reporting Council of Nigeria (FRCN) Act, was enacted in 2011 to replace the existing NASB to facilitate the smooth adoption and subsequent implementation of IFRSs in the country. Even though there is history of compliance with SAS in the country among listed firms (for review: Adeyemi, 2005; Kantudu, 2005; Oghuma and Iyoha, 2006), the FRCN Act empowers the Council under Sections 64 and 65 to mount penalties on non-complying firms.

Nonetheless, the disclosure of IC elements in country is voluntary because the adoption of accounting standards is still on "apply or explain" basis. In brief, the above discussion explains the position of accounting and reporting regarding intangible assets in general and IC in particular within the context of the Nigerian economy.

Ethnic and religion diversity in Nigeria

Nigeria, since unification in 1914 by her colonial master, has witnessed numerous ethnic and religious struggles and conflicts of varying magnitudes. Though, there are about 350 ethnic groups in the country, three are seen to be main dominants, Hausa/Fulani, Yoruba and Igbo. These three main groups are well represented across the industries in the country.

Unlike ethnicity, the religious composition in the country is divided into two groups: Islam and Christianity. Meanwhile, the religious composition among Yoruba is said to be evenly divided along Islam and Christianity. While Hausa/Fulani are predominantly Muslims, Igbo are predominantly Christian.

Ideally, the spirit of federation and nationalism upon which the nation is built is expected to override all ethnic or religious affiliations of Nigerians, but unfortunately this is not the case. Diversity *per se* is not the problem. Its management, however, presents Nigeria with formidable challenges. A divisive interplay of ethnicity and religion in Nigeria has led to rising nationalism and militancy of various ethnic and religious movements in the society at large.

This situation has led to the constitution of a National Conference Committee. This committee is a formal platform for dialogue by constituent units of the nation convened by the country's president and the national government in mid-2014 to discuss issues or problems that inhibit national progress or challenge national cohesion and to find solutions to perceived societal problems endangering the unity of the nation. The committee clearly identified religion and ethnic diversity as two main issues affecting socio-economic activities in the country (Confab, 2014, p. 36).

The main finding of the conference relates to the impact of religion and ethnic diversity at the macro level in country. Given that directors are persons of different ethnic and religious groups; the current study assumes that these attributes might be equally affecting directors' decision making in the board room. These two variables were used as surrogates of board diversity in the current study.

To a significant extent, some of the above highlighted issues justify the suitability of Nigeria as the domain of this study of the religion and ethnic background of members of corporate boards of directors as surrogates of board diversity. As discussed earlier, the Nigerian economy is presently being streamlined towards a knowledge base. This provides the researcher with the opportunity of examining further the value relevance of IC in the country as this can be adequately examined only in an economy where intangible assets are said to be prominent and important (e.g. Edvinsson, 1997; Lev, 2000; Lev and Sougiannis, 1996; Marr and Schiuma, 2001).

IC disclosure and CMV

Examination of economic consequences of corporate information disclosure has occupied a central role in recent times in accounting and finance research (e.g. Siagian *et al.*, 2013; Loukil and Yousfi, 2012). The rationale behind such research has implications for policy making, most especially, in the standard-setting process (Christensen *et al.*, 2007). Actually, an understanding of economic consequences of information disclosure can provide a basis for evaluating the costs and benefits of disclosure (e.g. Leuz and Verrecchia, 2000; Verrecchia, 2001), which is mostly being considered by the standard setters (Botosan, 2006). In the context of the consequences of disclosure, the question of whether firms benefit from increased disclosure via a lower cost of capital remains controversial.

However, although a large number of studies have attempted to find answers to this question, they have generated mixed results. Results range from highly negative impact to an insignificant impact (see Botosan, 1997, 2006). In order to reconcile these conflicting results, several researchers have adopted different types of disclosure, for example, aggregate disclosures (e.g. Botosan, 1997; Botosan and Plumlee, 2002), social disclosures (Alan and Welker, 2001), quarterly and other public relations disclosures (Botosan and Plumlee, 2002) and strategic disclosures (Gietzmann and Ireland, 2005). Botosan (2006) reviewed the relevant academic research in an attempt to shed more light on the relationship between disclosure and cost of capital. She concluded that the findings are generally mixed and, even more importantly, suggested that the impact of disclosure on the cost of capital varies depending of

the type of information. She therefore calls for additional research to enhance understanding of the impact of different types of disclosure on the cost of equity capital.

Built on the studies of Mangena *et al.* (2010), the current study considers the role of intellectual capital information disclosure in corporate annual reports in influencing corporates' cost of capital. The choice of intellectual capital disclosure is motivated, first, by the importance of information related to the most relevant component in the value-creating processes, second, by the growing demand for this kind of information and, finally, by the role played by intellectual capital disclosure to compensate for the value relevance loss of traditional financial reporting.

The research question is whether IC disclosure has any impact on a firm's market value which is proxied by market capitalization and cost of capital. Support for the effects of IC disclosure on market capitalization has been provided in a few studies. For example, Anam *et al.* (2011) and Abdolmohammadi (2005) both found that ICD has a positive significant effect on market capitalization. Anam *et al.* (2011) analyzed Malaysian firms, while Abdolmohammadi (2005) studied a sample of Fortune 500 in the USA. Both studies utilized aggregate value for ICD without analyzing the impact of individual components (human capital, structural capital and relational capital) on market capitalization in their studies.

Boujelbene and Affes (2013) investigated the influence of IC disclosure on firms' cost equity financing using SBF 120 index in France and they documented support for an inverse correlation of human and structural components of IC and cost of equity, but no inverse relationship with relation capital analyzing the influence of IC disclosure on cost equity capital of 126 quoted companies on the London Stock Exchange, Mangena *et al.* (2010) found that IC disclosure (human, structural and relational) has a significant inverse relationship with the cost of equity capital.

Further, from an international point of view, Orens *et al.* (2009) investigated the effect of internet-based IC disclosure on corporate value and cost of capital across four European nations (Belgium, France, Germany and the Netherlands). The study found a negative association between independent and dependent variables and as well establishing significant relationship between IC disclosure and corporate value. Similarly, Kristandl and Bontis (2007) examined the influence IC disclosure on corporate cost of financing of 95 quoted firms in Austria, Germany, Sweden and Denmark. While the voluntary disclosure was grouped into "historical information and forward-looking information", the theoretical expectation was documented regarding degree of "forward-looking information" disclosure, and a positive relationship was documented between the degree of "historical information" and corporate cost of equity.

Theoretical framework and hypotheses development

Signaling theory

Signaling theory proposes that high-quality entities should signal their potential to the market, as signaling causes market participants (e.g. investors) to re-evaluate the worth of the firm, and then make decisions more favorable to the company (Whiting and Miller, 2008). Similarly, the favor of these participants is expected to encourage more investment in the company, and therefore reduce the costs of raising capital. Corporate entities have various avenues through which to signal information about themselves, which may include voluntary disclosure of positive accounting information (e.g. CSR and IC) in financial statements (e.g. Watson *et al.*, 2002; Xiao *et al.*, 2004).

In the recent transformation of the global economy to a knowledge base, voluntary IC disclosure has been considered a valuable means for firms to communicate their "superior quality" to the market due to the role of IC for future wealth creation (Whiting and Miller, 2008). Further, entities with a strong IC base could differentiate themselves from "low-quality firms" through voluntary disclosure of IC (Vafaei *et al.*, 2011). It is repeatedly

contended that signaling of IC elements, for example their voluntary disclosure in financial statements, could bring advancement in corporate value by enhancing company image, attracting potential investors, reducing capital costs, minimizing stock price volatility, creating and improving an understanding of its products or services and, more significantly, enhancing the association with various interested parties to the company (Rodgers, 2007; Singh and Mitchell Van der Zahn, 2008; Vergauwen and Alem, 2005). Other studies on the subject (e.g. García-Meca *et al.*, 2005; Oliveira *et al.*, 2006) also conclude that signaling quality to the market may be a better motivating factor for corporate firms to communicate information related to IC, though the emphasis and format of reporting may differ between various companies.

Upper echelons theory

Upper echelons theory was established on the understanding that organizational performances are directly influenced by the knowledge, experiences and expertise of those individuals in higher managerial role in the organization (Hambrick and Mason, 1984).

The theory places primary emphasis on observable managerial characteristics such as age, tenure in the organization, functional background, education, socio-economic roots and financial position among others as indicators of the "givens" that a manager brings to an administrative situation (Hambrick, 2007) and which usually affect their decision-making activities and corporate outcome (Ben-Amar *et al.*, 2013). These observable characteristics are common features of corporate board of directors' members that have been defined as board diversity (Coffey and Wang, 1998). Diversity of Board is defined as dissimilarity among its members resulting from manifold sources of difference such as expertise and managerial background, personalities, learning styles, education, age and values (e.g. Coffey and Wang, 1998; Johanne *et al.*, 2007). In line with the focus of the present study, the upper echelons theory is appropriate in explaining the moderating role of board diversity on the relationship between corporate value and IC in terms of board composition (Hao and Shih, 2008) and managerial discretion (Finkelstein and Hambrick, 1990). However, while board diversity has been defined using features such as gender, age, education, culture, race and religion, the current study utilizes only religion and ethnic affiliation as surrogates of diversity of the board because of their roles in day-to-day events in Nigeria (Confab, 2014). To sum up, in this study upper echelon theory is adopted in explaining the moderating influence of religion and ethnicity on the expected relationship between IC disclosure and CMV.

Hypotheses development

IC disclosure and cost of capital. The influence of disclosure on cost of capital has been examined in many theoretical and empirical studies in recent times. From the theoretical perspective, it has been contended that disclosure enhances information symmetry and thus minimizes corporate cost of capital. However, empirical findings remain inconclusive and are essentially contingent on the estimation of disclosure and corporate cost of capital (Espinosa and Trombetta, 2007).

From a theoretical viewpoint, the correlation between disclosure and a company's cost of capital is supported by two connected streams of theoretical literature (see Botosan, 1997). The basic hypothesis of these strands in the literature is that a company which presents adequate information on their events reduces information asymmetry in the stock markets. While the first theoretical viewpoint states that adequate disclosure enhances stock market liquidity and thus, minimizes the cost of equity capital either through reduced transaction costs or increased demand for a company's securities (e.g. Amihud and Mendelson, 1986; Diamond and Verrecchia, 1991), the second stream of studies argues that adequate

disclosure may minimize the cost of capital by lessening systematic risk estimate of the company's share (e.g. Barry and Brown, 1985; Mangena *et al.*, 2010).

Boujelbene and Affes (2013) investigated the influence of IC disclosure on firms' cost equity financing using SBF 120 index in France and they documented theoretical expectation of inverse correlation of human and structural components of IC and cost of equity but no inverse relationship with relation capital. Similarly, analyzing the influence of IC disclosure on cost equity capital of 126 quoted companies on the London Stock Exchange, Mangena *et al.* (2010) found that IC disclosure (human, structural and relational) has significant inverse relationship with the cost of equity capital. Further, from an international point of view, Orens *et al.* (2009) investigated the effect of internet-based IC disclosure on corporate value and cost of capital across four European nations (Belgium, France, Germany and the Netherlands). The study found negative association between independent and dependent variables, as well establishing significant relationship between IC disclosure and corporate value. Thus, in line with prior studies and with signaling theory, the present study hypothesizes as follows:

H1. There is a negative relationship between IC disclosure and cost of capital among the listed firms in Nigeria.

IC disclosure and market capitalization. The research question is whether, based on signaling theory, IC disclosure has any significant impact on a firm's market capitalization. Several studies have considered the impact of IC disclosure on market capitalization. For example, Anam *et al.* (2011) and Abdolmohammadi (2005) found that ICD has a significant positive effect on market capitalization. Anam *et al.* (2011) analyzed Malaysian firms, while Abdolmohammadi (2005) studied a sample of Fortune 500 in the USA. Similarly, Taliyang *et al.* (2014) revealed significant positive effect of IC disclosure on the market capitalization of 185 listed firms on Bursar Malaysia in the cross-sectional study of 2009. In line with these findings, the present study hypothesizes as follows:

H2. Intellectual capital disclosure has significant positive impact on the market capitalization of listed firms in Nigeria.

Intellectual capital disclosure, board diversity and CMV

The effectiveness of diversity of boards has resulted in two opposing views: homogeneity and heterogeneity. The former view perceives that with a more diverse range of views and opinions, consensus may be difficult to achieve, which in turn may increase conflict, delay decision making and group-think and devolve personal responsibility (e.g. Erhardt *et al.*, 2003; Hambrick *et al.*, 1996; Knight *et al.*, 1999).

The heterogeneity view holds that a well-diversified board has greater benefits for the organization's stakeholders, and a lower degree of board diversity might raise significant ethical and economic problems since it would be unethical for a set of individuals to be denied access to societal power on the basis of their gender, race, religion or any other individual traits unrelated to their ability (Keasey *et al.*, 1998). It is further considered that board homogeneity represents foregone talent and, by implication, reduces performance; it amounts to sub-optimal value of the company's board if a section of the community's intelligence is methodically exempted from board directorships due not to talent incapability but to gender, religion, ethnicity and so on (e.g. Burke, 1997).

Studies such as Crano and Chen (1998) suggest that the inclusion of a person of different ethnicity into the social mix of the board of directors has the potential to stimulate divergent thinking in the decision-making process and has a far-reaching effect on the organization's performance. In addition to promoting change in the original perceptions and views held by the board of directors, the introduction of a board member from a different ethnic group may

also assist in generating more original approaches to intellectual and decision-making tasks (e.g. Bantel and Jackson, 1989). Further, Erhardt *et al.* (2003) specifically suggest that board diversity might boost access to critical resources, which suggests a positive performance impact of diversity as it relates to age, gender and nationality. For example, a more diverse board could benefit from a greater understanding of its customers (Carter *et al.*, 2003) or other key stakeholders. Also, management research has highlighted that board diversity might enhance boards' task performance, such as the board roles of service/advice, monitoring and resource access (Daily and Dalton, 2003). For instance, Maznevski *et al.* (2002) reveal that cross-cultural teams are more creative and generate additional and better alternative solutions and that the performance variation is higher for teams with greater cultural diversity.

However, from an intellectual capital research point of view, studies on the influence of board ethnicity on IC are very scant. An exception is the study by Abdul Rashid *et al.* (2012), who examine the impact of board ethnicity on IC disclosure in initial public offer form Malaysia. The authors reveal an absence of significant relationship between IC disclosure and ethnicity of corporate boards in the country. Also, Williams (2001) reveals that ethnic diversity on the boards of directors of South African publicly listed firms has a positive association with intellectual capital performance. The author concludes that South African publicly listed firms may be able to enhance their intellectual capital performance by utilizing a well-balanced and structured board of directors in terms of ethnic representation. Further, regarding association between board ethnicity and corporate value, Ntim (2015) examined the impact of board ethnicity on corporate value and reveals positive association between the two concepts. Wellalage and Locke (2013) also document a positive significant effect of board ethnicity on firm financial performance among the listed firms in Sri Lanka.

Thus, board ethnicity can be used as moderating variable on the relationship between IC and corporate value; this explains the dual role of board of directors in line with the basic principles of corporate governance (e.g. Fama, 1980; Keenan and Aggestam, 2001) and upper echelons theory (e.g. Hambrick, 2007; Hambrick and Finkelstein, 1987; Hambrick and Mason, 1984). Meanwhile, ethnicity is considered as one the issues that affect daily events in Nigeria, especially in the political and public circles. The possible effects of this concept are also expected in the board room as well as in the capital market. Hence, the study hypothesizes:

H3. Board ethnicity significantly moderates the relationship between IC disclosure and CMV.

Similarly, religion has been seen as an individual's self-identity; deviation from religious role anticipation also creates higher degrees of cerebral and expressive embarrassment, which encourages devotees to maintain their actions in line with role expectations (Weaver and Agle, 2002). Studies have revealed the impact of religion on the corporate directors' decisions and organizational outcomes. For example, McGuire *et al.* (2012) found that the association between religion and financial reporting quality is stronger when external monitoring is lower. They found that religion is negatively associated with accounting risk, the likelihood of shareholder lawsuits, and the likelihood of a restatement. Also, El Ghoul *et al.* (2012) found that religion is negatively associated with the firm's cost of capital. Hilary and Hui (2009) provide indirect evidence suggesting that investors perceive a positive association between religion and risk aversion in US counties. They attribute their findings to marginal investors in the equity market of those firms being less risk averse than the firms' managers. Unlike ethnicity, religion of the board has not been used in research relating to IC. However, based on the basic principles of dual role of boards of corporate organizations and upper echelons theory, the current study assumes that religion, like any other board features, can be used as a moderating variable between IC and CMV.

Besides, Nigeria is considered among the nations where religion plays vital role on the decision activities, especially in the public and political environment. Since corporate board members are also member of society at large, their religion tendencies could be assumed to have effect on their action and inaction in the board room. Hence, the present study hypothesizes as follows:

H4. Board religiosity has significant moderating effect on the relationship between IC disclosure and CMV.

Methodology

The study seeks to examine the value relevance of IC disclosure in the emerging market of Nigeria. The study uses secondary sources of data of annual reports and accounts in line with prior IC disclosures studies (e.g. Abeysekera, 2008; Haji and Ghazali, 2012; Haji and Mubaraq, 2012; Oliveras *et al.*, 2008) as they are most significant documents that provide the results of stewardship from the management to corporate stakeholders, especially residual owners (Beretta and Bozzolan, 2004; Deegan and Rankin, 1997). Annual reports also have a high degree of reliability and credibility compared to other information (Neu *et al.*, 1998), since the corporate directors accept responsibility.

In addition, the study surveys all 178 firms listed on the main board of NSE as of January 2010 as population for the purpose of analyses in order to generate findings that have a far reaching generalizability across all the economic sectors in the country. However, based on the nature and objectives of this study, it employs five filters to eliminate some of the firms that are considered unsuitable for the study. These eliminated companies include: first, companies that voluntarily withdrew from the stock market during the period; second, companies that were placed on technical suspension or are being delisted by regulators during 2010 to 2014; third, firms engaged in schemes of merger and acquisition during the research period; fourth, any firm that has been nationalized by the government through its agencies; and, finally, any company that cannot provide adequate data regarding the variable of interest of the present study. Considering these filters at the end of December 2014, the population was filtered down to 91 firms, representing about 51 percent of the total population of listed firms on the main board of the Nigerian Stock Exchange during the period under study. Table I exhibits the sectorial classifications of these firms and their percentages.

Dependent variables

Cost of capital estimation. This study employs the price/earnings to growth ratio advanced by Easton (2004) to compute the cost of capital. Studies such as those of Khurana and

S/N	Sectors	Numbers	Percentage
1	Agriculture	2	2.20
2	Conglomerates	4	4.40
3	Construction/real estate	2	2.20
4	Consumer goods	16	17.58
5	Financial services	34	37.36
6	Healthcare	7	7.69
7	ICT	3	3.30
8	Industrial goods	8	8.79
9	Oil and gas	4	4.40
10	Services	11	12.08
	Total	91	100.00

Table I. Sectorial classifications of sample firms

Raman (2004) and Botosan and Plumlee (2005) document that this approach is a better estimate of corporate cost of capital because it yields a measure capturing stock risk in a consistent and predictable direction and requires only data on stock price and earnings growth, thus avoiding the problem of losing a substantial number of observations, as compared to other approaches.

Market capitalization. Market capitalization is measured as product of the number of shares outstanding and the year-end share price of sampled firms as employed in the earlier IC disclosure-related studies (Abdolmohammadi, 2005; Anam *et al.*, 2011).

Independent variable

The IC disclosure checklist. The study utilizes content analysis (CA) to generate information for the purpose of analysis. An important component of CA is to structurally amplify a checklist that could enable categorization of the content units. Consequently, following the review of prior studies, the present study develops a checklist after familiarization with the pattern of IC disclosure of sampled firms with ten leading firms in the country by market capitalization. The 49 selected items of IC are comprised of 16 human capital, 9 process capital, 6 innovation capital, 5 protected capital and 13 relational capital. IC information was extracted from the chairman and chief executive officer reports. Table II displays the details of each categorization's items.

Scoring IC disclosure. A scoring measure on a Likert scale of four (0-3) was considered in order to measure the quality of IC disclosure (e.g. Abeysekera, 2008; Guthrie *et al.*, 2006). Following Haji and Ghazali (2012), a score of 3 was given if the items were disclosed in terms of Naira, the Nigerian unit of currency; a value 2 was given if the items were disclosed in numerical form; a value of 1 was given if the item appeared in narrative form, and a value of

A	*Human capital*	*C*	*Customer/relational capital*
1	Number of employees	1	List of customers
2	Employee satisfaction	2	Customer satisfaction
3	Employee retention	3	Customers loyalty
4	Compensation to employees	4	Customer Appreciation
5	Engagements with employees	5	Customer retention
6	Recruitment from the local communities	6	Customer service/support
7	Disability recruitment policy (number)	7	Customer feedback system
8	Employee know-how	8	Distribution channels
9	Education background	9	Customer Market Share
10	Employee succession planning program	10	Company awards
11	Work-related knowledge	11	Company image/ reputation
12	Knowledge sharing	12	Customer training & education
13	Employee health and safety	13	Diffusion & networking
14	Employee expertise		
15	Training and development	*D*	*Innovation Capital*
16	Cultural diversity	1	Innovation
		2	Research and development
B	*Process Capital*	3	Brands
1	Corporate culture	4	Knowledge-based
2	Information systems (Technology)	5	Research collaboration
3	Financial relations	6	Goodwill
4	Business collaboration		
5	Favorable contracts	*E*	*Protected capital*
6	Organization flexibility	1	Patent
7	Organization structure	2	Copyright
8	Organization learning	3	Trademarks
9	Quality management	4	Licenses
		5	Commercial rights

Table II.
Checklists of IC disclosure items

0 was given if the item did not appear in the annual report. Thus, the total scores for overall disclosure and each of components were computed as the proportion of actual score (A × S) to maximum possible score (M × S) (i.e. 3 × 49 = 147). The T × S of a company is obtained by:

$$T \times S = \frac{A \times S}{M \times S}$$

Validity and reliability of the score. Validity and reliability of the scores have been a source of concern in intellectual capital disclosure in recent times (Dumay and Cai, 2014) due to inherent problems associated with the approach. To overcome this, the present study carried out a two-stage checklist scoring approach. The authors began with pilot scoring using the top ten listed corporate entities in order to create familiarization with the annual reports. They then scored the sampled annual reports independently and compared their scores. The areas of difference were then rescored jointly to correct the discrepancies.

Moderating variables. Board ethnicity and religion were utilized as moderating variables in the present study. The information on these variables was derived from firms' financial statements. Because specific names are associated with specific ethnic groups in Nigeria, it is very easy to identify individual ethnic and to large extent religion affiliation. The details of each director were found in the chairman's report component of financial statements and where the religious affiliation could not be ascertained, further enquiry about such individuals was made by electronic search for their curriculum vitae. This study utilizes a dichotomous variable to proxy the level of ethnicity and religion of corporate board of directors.

The dummy variable is based on the quorum of meeting of board of directors as stated in the SEC code of corporate governance in Nigeria. Since the quorum of the meeting of BOD is two-third of its members, as stated in the SEC's code of corporate governance, the study assigned 1 to corporate boards with two-thirds of their members belonging to the same ethnicity and 0 where this was not the case. The same process was followed for religious affiliation. This measure prevents the likelihood of a multicollinearity problem usually associated with interaction variables (Field, 2013; White and Bui, 1988; Wooldridge, 2010). This is in line with the homogeneity view of board diversity.

Control variables. Based on theoretical assumptions of the present study and prior empirical studies (e.g. An *et al.*, 2011; Botosan, 2006; Botosan and Plumlee, 2002; Bowen *et al.*, 2008; El Ghoul *et al.*, 2011; Galbreath, 2005; Hail, 2002; Kakani *et al.*, 2001; Valentin, 2014), the study incorporates risk, age, profitability and firm size as control variables. For instance, the larger the firm size the better is its ability to assess the finance in the market and thus affect the cost of financing. Also, the current study employs total risk, the combination of financial and business risk of corporate entities (Fama and French, 1993; Gabriel and Baker, 1980), as opposed to leverage, which is commonly utilized in IC related studies (Clarke *et al.*, 2011; Firer and Williams, 2003; Shiu, 2006) but can explain only the financial risk, leaving out the inherent risk of doing business, which most affects corporate performance (Bodie *et al.*, 2011).

The rate of return earned by a corporate entity also determines the manner in which the market perceives its creditworthiness, thus influencing the CMV (Abdolmohammadi, 2005). Similarly, the already "established" firms with greater history have market confidence which can attract and retain capital and this is expected to influence the CMV. Risk is estimated through standard deviation of expected daily return on the share prices of the sampled firms over the period of January 2012 to December 2014. (e.g. Bodie *et al.*, 2011; Fama and French, 1993). Firm size is measured, in line with prior studies (e.g. El Ghoul *et al.*, 2011; Valentin, 2014), as the natural logarithm of total assets. Profitability is estimated by

return on assets (Abdolmohammadi, 2005) and age is measured on the year of quotation on Nigeria Stock Exchange to date. Accordingly, the study expects a significant positive level of risk and cost of capital as the more the information is available to the investors, the better is their understanding regarding the activities of the corporate entities and inverse relationship with the market capitalization. The relationship between firms' size, age, profitability and cost of capital and market capitalization is expected to be negative and positive, respectively.

Data analysis methods

This section presents methods of estimator employed in the present study to analyze the data for the purposes of answering the research questions and testing the hypotheses. The study commences analyses with description of data to confirm the normality of the series and this is followed by Pearson Correlation Matrix and Variance Inflation Factor in order to evaluate the possibility of multicollinearity among independent variables (e.g. Field, 2013; Hinton *et al.*, 2004). Two-step system generalized method of moment GMM was employed due to its capacity to overcome the problem of endogeneity of variables which are commonly observed in corporate governance research (Schultz *et al.*, 2010; Wintoki *et al.*, 2012). GMM corrects for the potential impact of autocorrelation, heteroskedasticity, and contemporaneous correlation inherent in panel structure (for review, Blundell and Bond, 1998, 2000; Certo and Semadeni, 2006; Roodman, 2008), which could affect the expected relationship between dependent and independent variables. Thus, the estimations were made based on stochastic models as follows:

Model 1:

$$CMV_{it} = \gamma_0 + \gamma_1 CMV_{it-1} + \gamma_2 \sum_{i=1}^{5} W\_TICD_{it} + \gamma_3 \mathrm{RISK}_{it} + \gamma_4 \mathrm{Size}_{it} + \gamma_5 \mathrm{Age}_{it} + \gamma_6 \mathrm{ROA}_{it} + \varepsilon_{it}$$

Model 2:

$$CMV_{it} = \delta_0 + \delta_1 \delta CMV_{it-1} + \delta_2 \mathrm{WHCD}_{it} + \delta_3 \mathrm{WCCD}_{it} + \delta_4 \mathrm{WINCD}_{it} + \delta_5 \mathrm{WPCD}_{it} + \delta_6 \mathrm{WPRCD}_{it} + \delta_7 \mathrm{RISK}_{it} + \delta_7 \mathrm{Size}_{it} + \delta_8 \mathrm{Age}_{it} + \delta_9 ROA_{it} + \varepsilon_{it}$$

Model 3:

$$CMV_{it} = \vartheta_0 + \vartheta_1 CMV_{it-1} + \vartheta_2 \sum_{i=1}^{5} W\_TICD_{it} + \vartheta_3 \mathrm{Ethnic}_{it} + \vartheta_4 \mathrm{Religious}_{it} + \left[\vartheta_5 \sum_{i=1}^{5} (W\_TICD_{it}) \times \mathrm{Religious}_{it}\right] + \left[\vartheta_6 \sum_{i=1}^{5} \left(W_{TICD_{it}}\right) \times \mathrm{Ethnic}_{it}\right] + \vartheta_7 \mathrm{RISK}_{it} + \vartheta_8 \mathrm{Size}_{it} + \vartheta_9 \mathrm{Age}_{it} + \vartheta_{10} ROA_{it} + \varepsilon_{it}$$

Model 1 was used to estimate the impact of overall IC disclosure on CMV. The individual effect of IC disclosure components on the CMV was estimated with Model 2, while the moderating effect of board diversity was examined with the Model 3. The details definition, measurements and sources of acronyms utilized in the models are presented in Table III.

Symbol	Definition	Measurement	Sources
WHCD	Weighted human capital disclosure	Ratio of actual to maximum possible score of HC	Annual report
WRCD	Weighted relational capital disclosure	Ratio of actual to maximum possible score of RC	Annual report
WINCD	Weighted innovation capital disclosure	Ratio of actual to maximum possible score of INC	Annual report
WPCD	Weighted process capital disclosure	Ratio of actual to maximum possible score of PC	Annual report
WPRCD	Weighted protected capital disclosure	Ratio of actual to maximum possible score of PRC	Annual report
W_TICD	Weighted overall intellectual capital disclosure	Ratio of actual score to maximum possible score overall IC	Annual report
L_MCAP	Natural log of market capitalization	Product of year end price and number of outstanding	NSE website/annual report
COC	Cost of capital	Price/earnings to growth	Financial analysts reports
RISK	Total risk	Standard deviation of expected daily price return	NSE website
ROA	Return of net assets	Ratio profit after to net assets	Annual report
SIZE	Firm's size	Log of total assets	Annual report
AGE	Firm's age	Year of listing to date	NSE website/annual reports
RELIGIOUS	Religion affiliation of board member	1 if 2/3 has the same religious background, otherwise 0	Annual report/Firms' website
ETHNICITY	Ethnic Affiliation of board member	2 if 2/3 has the same religious background, otherwise 0	Annual report/firms' website

Table III.
Details of acronyms

Results and findings

Summary of descriptive statistics. Table IV presents a summary of descriptive statistics on the quality of disclosure of various IC categories, overall IC disclosure, dependent variables and control variables. The mean, standard deviation, skewness and kurtosis and Jargu Bera value are provided. As shown in Table IV, the IC category "process capital" has the highest frequency of disclosure with a mean of approximately 66 percent in proportion to total expected value of the component. This is followed by relational capital at 65 percent, internal capital at 62.9 percent, human capital at 62.5 percent and protected capital at 59.3 percent. Table IV also indicates a negative average cost of capital at 45.9 percent and profitability at 22 percent. These might have resulted from the range value between the minimum (−333.53 percent for cost of capital and −117.302 percent for ROA) and maximum (131.9334 for cost of capital and for 1.066107 for ROA). The possible implication for this might be that there is relationship between the cost of capital and ROA as it is further proved by result of correlation efficient of 0.920. The deviation of almost all the observations from the mean are pronounced and results of skewness and kurtosis suggest the possibility of a normality problem (e.g. Field, 2013; Gujarati and Porter, 2009; Wooldridge, 2010). Similarly, the Jargu Bera statistic indicates the presence of heteroscedasticity of the residual of the regression, thus making the traditional ordinary least square unsuitable for the parameters estimations (e.g. Baltagi, 2008; Hill *et al.*, 2011; Kennedy, 2008).

Table V presents the frequency distribution of the moderating variable. The table shows that 45.3 percent of the sampled firms have their board dominated by members from the same ethnicity, while 74.9 percent of the board is constituted by members of the same religion. This means that in Nigeria corporate boards are dominated along ethnic and religious lines.

	Mean	Median	Maximum	Minimum	SD	Skewness	Kurtosis	Jarque-Bera	*p*-value	*n*
WHCD	0.625141	0.625	0.979167	0.291667	0.124823	0.160081	2.898208	2.078596	0.353703	442
WCCD	0.649843	0.666667	0.897436	0.153846	0.127977	−0.458431	2.890057	15.70434	0.000389	442
WINCD	0.629462	0.666667	0.888889	0.277778	0.132375	−0.447893	2.552222	18.47077	0.000098	442
WPCD	0.658371	0.666667	0.925926	0.296296	0.130664	−0.246291	2.198345	16.30405	0.000288	442
WPRCD	0.593363	0.6	0.933333	0.2	0.174852	−0.17384	2.229461	13.16077	0.001387	442
W_TICD	0.56181	0.58298	0.97934	0.029772	0.030804	−0.467009	3.90335	6.234870	0.000345	442
L_MCAP	10.09276	10.00641	12.57191	6.119279	0.948026	−0.232235	4.036111	23.74385	0.000007	442
COC	−0.459	0.1131	131.9334	−333.53	17.25751	−15.34843	323.3686	1907568	0.000000	442
RISK	3.007215	2.563247	29.0759	0	3.015924	4.214607	28.15977	12966.54	0.000000	442
ROA	−0.220389	0.034827	1.066107	−117.302	5.583136	−20.93535	439.5278	3541704	0.000000	442
SIZE	10.49217	10.34239	12.63776	6.572755	0.9506	0.166776	3.19499	2.749214	0.252939	442
AGE	18.9095	18	49	1	13.12649	0.346813	1.729251	38.59986	0.000000	442

Table IV.
Summary of descriptive statistics

Multicollinearity test

Table VI presents the result of correlation coefficient among the variables before the regression analyses are considered. The matrix shows the absence of a multicollinearity problem among the explanatory variables as the coefficients are within the acceptable region as suggested by prior studies. For instance, Gujarati and Porter (2009) and Field (2013), respectively, set the level of coefficient of correlation below 0.8 and 0.9; otherwise there could be a collinearity problem. The result indicates that business risk is positively and negatively correlated with cost of capital and market capitalization at 0.047 and −0.020, respectively. This is in line with theoretical arguments and findings from previous studies and justifies its selection as a control variable by the present study.

Table VII presents the results of VIF and tolerance value of the series in a further consideration of the possibility of multicollinearity. All variables have VIFs of less than 2 and tolerance of higher than 0.5 across the panels. These further suggest the absent of multicollinearity as the values are below the benchmark of 10 for VIF and above 0.10 for tolerance (Field, 2013; Hill *et al.*, 2011; Wooldridge, 2010).

IC disclosure and cost of capital

The result in Panel B is used to confirm the aggregate IC disclosure while the Panel A is employed for the IC disclosure categories. Table VIII presents the results of two-step system dynamic GMM of the relationship between cost of capital and IC disclosure. The result of aggregated disclosure is presented in Model 1, while Model 2 reveals the results of each component of IC as proposed in the present study. Overall, Model 1 reveals a significant negative impact of IC disclosure on the corporate cost of capital of listed firms in Nigeria. The finding is in line with signaling theory and conforms to other, earlier studies of the relationship between disclosure and cost of capital (Botosan and Plumlee, 2002; Boujelbene and Affes, 2013; Kristandl and Bontis, 2007; Orens *et al.*, 2009) and also confirms the hypothesized relationship in the present study. However, the results from the estimate of Model 2 reveal diverse findings considering the individual components. While human capital, customer capital and innovation capital disclosures conform to the expected negative association between IC disclosure and cost of finance, the result is otherwise regarding process capital and protected capital disclosures. Further, the results from control variables from Models 1 and 2 show firm size and age have significant negative relationship with the cost of capital. This is in line the expectation of the present study. Risk and profitability have significant positive impact on the cost of capital.

IC disclosure and market capitalization

Table IX presents the regression estimate of the relationship between IC disclosure and market capitalization. The results of two-step system dynamic GMM reveal a significant

Variable	Frequency	Percent
Ethnicity		
0	249	54.7
1	206	45.3
Total	455	100.0
Religiosity		
0	114	25.1
1	341	74.9
Total	455	100.0

Table V.
Frequency distribution of moderating variables

	WHCD	WCCD	WPCD	WInCD	WPrCD	WTICD	Risk	ROA	Size	Age	COC	L_MCAP	Ethnicity	Religiosity
WHCD	1.000													
WCCD	0.346**	1.000												
WPCD	0.265**	0.314**	1.000											
WInCD	0.194**	0.240**	0.238**	1.000										
WPrCD	0.097*	0.271**	0.185**	0.222**	1.000									
WTICD	0.572**	0.679**	0.622**	0.598**	0.639**	1.000								
Risk	−0.034	−0.005	0.072	−0.080	0.069	0.014	1.000							
ROA	0.024	0.023	−0.017	−0.032	−0.022	−0.010	0.045	1.000						
Size	0.203**	0.133**	−0.024	−0.086	−0.055	0.042	0.091	0.195**	1.000					
Age	0.047	−0.029	−0.083	0.003	−0.027	−0.030	0.102*	−0.003	0.051	1.000				
COC	−0.004	0.032	0.001	−0.022	−0.023	−0.007	0.047	0.920**	0.175**	0.023	1.000			
L_MCAP	0.122**	0.050	−0.016	−0.078	−0.049	0.002	−0.020	0.033	0.696**	0.117*	0.022	1.000		
Ethnicity	−0.131	0.073	−0.055	−0.042	0.066	−0.019	−0.016	−0.052	−0.022	−0.047	−0.037	−0.020	1.000	
Religiosity	0.023	−0.119	0.008	−0.091	−0.084	−0.089	−0.002	−0.029	0.056	−0.064	−0.058	0.021	−0.024	1

Notes: *,**Significance at 10 and 5 percent levels, respectively

Table VI.
Coefficient of correlations matrix

Variable	Panel A VIF	1/VIF	Variable	Panel B VIF	1/VIF
WCCD	1.31	0.762548	W_TICD	1.02	0.985002
WHCD	1.25	0.80307	Ethnicity	1.01	0.993623
WPCD	1.21	0.826014	Religiosity	1.02	0.979424
WInCD	1.16	0.858953	Size	1.06	0.946612
WPrCD	1.13	0.883303	ROA	1.05	0.955463
Risk	1.04	0.958126	Religiosity	1.02	0.979424
ROA	1.04	0.959886	Age	1.02	0.983836
Age	1.02	0.978008	Risk	1.01	0.986056
Size	1.14	0.880645			
Mean VIF	1.15		Mean VIF	1.03	

Table VII. Variance inflation factor and tolerance value

	Model 1				Model 2			
	Coef.	SE	*Z*-value	*p*-value	Coef.	SE	*Z*-value	*p*-value
COC(-1)	−0.00257	0.000157	−16.32***	0.000	−0.0031719	0.0001277	−24.85	0.0000
W_TICD	−1.27792	0.073432	−17.4***	0.000				
WHCD					−8.890793	0.3728466	−23.85***	0.0000
WCCD					−1.714441	0.2499379	−6.86***	0.0000
WPCD					5.943659	0.2471815	24.05***	0.0000
WInCD					−4.797053	0.2197414	−21.83***	0.0000
WPrCD					3.191353	0.1745087	18.29***	0.0000
Risk	0.05736	0.006407	8.95***	0.000	0.0292193	0.0078681	3.71***	0.0000
ROA	2.890546	0.010342	279.49***	0.000	2.921279	0.0094325	309.7***	0.0000
Size	−0.348749	0.034373	−10.15***	0.000	−0.0403556	0.0428418	−0.94	0.3460
Age	−0.06328	0.001171	−54.05***	0.000	−0.0578253	0.0018428	−31.38***	0.0000
_cons	−0.22721	0.55684	−0.41	0.683	1.470161	0.4881677	3.01***	0.0030
Post estimation analyses								
Sargan test of over identifying restrictions			χ^2	47.6863			χ^2	87.03971
			Sig	0.4446			Sig	0.2509
Arellano-Bond test for zero autocorrelation		AR(1)	−1.0263	0.0304		AR(1)	−1.0333	0.0301
		AR(2)	0.87176	0.3833		AR(2)	1.287	0.1981

Note: ***Significance at 1 percent level

Table VIII. Regression result of the impact of IC disclosure on cost of capital

positive impact of aggregate IC disclosure on market capitalization. This confirms the *H2* and is consistent with the findings of the previous studies (e.g. Abdolmohammadi, 2005; Anam *et al.*, 2011; Taliyang *et al.*, 2014). Also, from the component perspective estimate based on Model 2, relational capital and process capital disclosures have significant positive impact on market capitalization, whereas the innovation capital and protected capital reveal negative relationship. While this is significant in the case of protected capital, it is not significant for innovation capital. The results from control variables from Model 1 show firm size, profitability and age have a significant positive impact on the market capitalization, while the level of risk is negatively significant with the dependent variable. The control variables result in Model 2 is similar to that of Model 1 except for profitability, which fails the statistical significance test.

IC Disclosure, board diversity and CMV

The result of two-step system dynamic GMM regression estimate of the moderating effect of board diversity on the relationship between IC disclosure and CMV is presented

	Model 1				Model 2			
	Coefficient	SE	*Z*-value	*p*-value	Coefficient	SE	*Z*-value	*p*-value
L_MCAP (-1)	0.6837912	0.0240199	28.47***	0.0000	0.7141584	0.0057306	124.62***	0.0000
W_TICD	0.3298638	0.0330111	9.99***	0.0000				
WHCD					0.0008163	0.0367341	0.02	0.9820
WCCD					0.4687449	0.0367933	12.74***	0.0000
WPCD					0.4226078	0.0347627	12.16***	0.0000
WInCD					−0.0498576	0.0328013	−1.52	0.1290
WPrCD					−0.1573998	0.0374006	−4.21***	0.0000
Risk	−0.037437	0.0041359	−9.05***	0.0000	−0.01925	0.000784	−24.55***	0.0000
ROA	0.0088266	0.0029063	3.04***	0.0020	0.0011708	0.0015335	0.76	0.4450
Size	0.3662209	0.0269404	13.59***	0.0000	0.2119225	0.0101203	20.94***	0.0000
Age	0.0159487	0.0025424	6.27***	0.0000	0.0073688	0.0003631	20.29***	0.0000
_cons	0.2336215	0.1690045	1.38	0.1670	0.7495975	0.0838345	8.94***	0.0000
Post estimation analyses								
Sargan test of over			χ^2	52.95171			χ^2	76.03083
identifying restrictions			Sig	0.2553			Sig	0.5738
Arellano-Bond test for		AR(1)	−1.7798	0.0751		AR(1)	−1.7664	0.0773
zero autocorrelation		AR(2)	−1.3499	0.1771		AR(2)	−1.7124	0.0680

Note: ***Significance 1 percent level

Table IX.
Regression result of the impact of IC disclosure on market capitalization

in Table X. The estimation was carried out using Model 3, and the results indicate the presence of the moderating effect of board diversity on the relationship between IC disclosure and corporate value. Specifically, the moderating effect of board diversity on the relationship between IC disclosures and market capitalization of listed firms in Nigeria shows a significant negative effect: 10 percent in the case of ethnicity and 1 percent in the case of religious affiliation. In the same vein, the moderating effect of board diversity on the association between IC disclosure and cost capital as presented in Table X indicates a significant moderating impact.

The estimate shows that both religious and ethnic composition of corporate board members has significant positive impact. These findings confirm *H3* and *H4* in the present study and are consistent with the basic principle of upper echelons theory regarding the significance of the composition of directors (Hambrick, 2007; Hambrick and Finkelstein, 1987; Hambrick and Mason, 1984) as well as being in line with the findings of previous studies (Al-Matari *et al.*, 2014a, b; Al-Matari, Al Swidi and Fadzil, 2014). These authors employed diversity on boards of listed firms in Oman in corporate governance related studies and they have documented significant impacts. The control variables from both estimates are in line with the theoretical expectations and are consistent with prior studies in expecting the profitability that shows a significant positive relationship with the cost of capital.

In addition, the study carried out further post-estimation tests in order to reaffirm the suitability of the estimator and the consistency of the estimated parameters (See Tables VIII, IX and X). Second order serial correlation tests were performed since GMM can produce reliable estimates only if there is no second order serial correlation in the error terms (Blundell and Bond, 2000; Roodman, 2008; Schultz *et al.*, 2010). The result of post-estimation robustness tests confirmed the absence of second order serial correlation in the error. Hence, the estimated parameters are reliable with the GMM as it has overcome the problem of heteroscedasticity identified in the preliminary analysis presented earlier.

The results of validity of instruments were achieved with the Sargan test of over identifying; the Sargan test reveals the validity of the instruments, which means they do not

	Market capitalization				Cost of capital			
Number of obs.				355				355
Number of groups				91				91
Number of instruments				84				84
	Coef.	SE	*Z*-value	*p*-value	Coef.	SE	*Z*-value	*p*-value
L_MCAP(-1)	0.7006	0.0158	44.47***	0.0000				
COC(-1)					−0.0029	0.0000	−107.11***	0.0000
W_TICD	0.2158	0.0326	6.63***	0.0000	−2.2267	0.1438	−15.49	0.0000
Ethnicity	0.2607	0.1259	2.07***	0.0380	2.9978	0.1486	20.17***	0.0000
Religiosity	0.9459	0.1517	6.23	0.0000	5.6947	0.4208	13.53***	0.0000
EW_TICD	−0.0747	0.0409	−1.83***	0.0680	0.4888	0.0440	11.11***	0.0000
RW_TICD	−0.2749	0.0429	−6.4***	0.0000	2.1784	0.1398	15.59***	0.0000
Risk	−0.0275	0.0016	−17.1***	0.0000	0.0286	0.0020	14.16***	0.0000
ROA	0.0015	0.0016	0.99	0.3250	2.9500	0.2600	11.34***	0.0000
Size	0.3129	0.0193	16.22***	0.0000	−0.6397	0.0237	−26.97***	0.0000
Age	0.0127	0.0018	7.11***	0.0000	−0.0001	0.0009	−0.09	0.9250
_cons	−0.4693	0.1645	−2.85***	0.0040	−0.7347	0.4234	−1.74***	0.0830
Post estimation analyses								
Sargan test of over	χ^2			82.22221	χ^2			72.73908
identifying restrictions	Sig.			0.2154	Sig			0.4866
Arellano-Bond test for zero	AR(1)		−1.6645	0.096	AR(1)		−1.0269	0.0773
autocorrelation	AR(2)		−1.8923	0.5585	AR(2)		0.95299	0.3406

Notes: *,**,***Significance at 10, 5 and 1 percent levels, respectively

Table X. IC Disclosure, board diversity and corporate market value

correlate with the disturbance as χ^2 values were not statistically significant across the estimates (e.g. Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 2000; Roodman, 2008).

Discussion of findings

The findings of various analyses conducted in the current study are highlighted above. The findings reveal the significant importance of IC disclosure on the CMV of listed firms on the floor of Nigeria Stock Exchange. Specifically, the information on IC is relevant to the various participants in the market as it affects market capitalization and cost of financing. On the aggregate disclosure level, the quantum of IC information has a positive impact of corporate market capitalization and lowering the cost of financing, which invariably enhances the firm's value. This is in line with the signaling theory of increasing corporate disclosure, where the information in annual reports is judged to be an important tool for investment decisions as it guides resources allocation by investors.

From the components viewpoint, the findings remain mixed due to a divergent level of impact on CMV. For instance, human capital, relational capital and process capital disclosure conform with the expected positive influence on market capitalization, but innovation and protected capital disclosure reveal negative impact. The possible explanation for the results being mixed might be that human capital, relational capital and process capital are judiciously employed by the firms and thus disclose more information or that investors are more concerned about these components than about innovation and protected capital. Similarly, human capital, relational capital and innovation capital disclosure have a negative impact on the cost of capital; this is consistent with the hypothesized relationship, in the case of protected capital and process capital disclosures. One possible conclusion that could be drawn from the component analyses is that in Nigeria during the period of this study relational capital, which is significant and conforms with the

hypothesized relationship between IC disclosure and CMV, is a major component that investors and other market participants prioritize.

The moderating effect of board diversity is also confirmed by the study. Based on the homogeneity view adopted in the present study through the concentration measurement, the results indicate the adverse moderating role of religious and ethnic composition of board members on the relationship between IC disclosure and CMV in Nigeria. A possible explanation is that when people from the same ethnic background dominate the board, there is some respect for the opinion of elders, which might not be in the interest of the company as a whole. The same applies to religion, as people of the same faith might avoid critical argument and confrontation even when there is need for critical analysis of events and situations before arriving at conclusion or resolution in the overall interest of the entity.

Conclusion

This study is informed by signaling theory in explaining the relationship between IC disclosure and CMV. The study proposes that the more IC disclosure there is, the better for CMV by lowing cost of capital and enhancing corporate market capitalization. Also, this study suggests, through applying upper echelons theory, the moderating role of religious and ethnic composition of board members on the relationship between IC disclosure and CMV.

The findings of the study confirm the expectations from both signaling and upper echelon theory frameworks, whereby there is a significant relationship between IC disclosure and CMV, on one hand, and the moderating effect of board diversity on this relationship, on the other. More importantly, the quality of IC disclosure is very strong in influencing CMV, and the interaction of concentration of board members from the same religious and ethnic background with IC disclosure reduces the CMV. From a practical perspective it is expected that "those charged with governance" should be concerned with the disclosure of IC information in the financial statements as IC information is value relevant to the investors in line with the signaling theory. The findings of this study may also have implications for the regulators, especially the FRCN regarding the board composition in the country for effectiveness of corporate governance. Boards should be discouraged from being dominated by board members with the same ethnic and religious affiliations. This could be done through issuance of standards on board composition. However, this is subject to certain limitations, which could present an opportunity for future research to extend this study. First, this study's sample comprises the 91 listed firms listed on the main board of Nigerian Stock Exchange. Hence, generalization of the results to smaller firms, in the alternative securities market ASeM, may be inappropriate. Future research could further investigate empirically whether the results can be generalized to smaller firms. Second, the study employs religious and ethnic background as moderating variables. Since the country's economy is open, whereby foreigners can serve on boards, the moderating role of foreign directors might also be examined.

References

Abdolmohammadi, M.J. (2005), "Intellectual capital disclosure and market capitalization", *Journal of Intellectual Capital*, Vol. 6 No. 3, pp. 397-416.

Abdul Rashid, A., Kamil Ibrahim, M., Othman, R. and Fong See, K. (2012), "IC disclosures in IPO prospectuses: evidence from Malaysia", *Journal of Intellectual Capital*, Vol. 13 No. 1, pp. 57-80.

Abeysekera, I. (2008), "Intellectual capital disclosure trends: Singapore and Sri Lanka", *Journal of Intellectual Capital*, Vol. 9 No. 4, pp. 723-737.

Abhayawansa, S. and Abeysekera, I. (2008), "An explanation of human capital disclosure from the resource based perspective", *Journal of Human Resource Costing and Accounting*, Vol. 12 No. 1, pp. 51-64.

Adebola, A. (2010), "An evaluation of corporate governance practices in Nigeria: challenges and recommendations", SSRN, available at: https://ssrn.com/abstract=1648623; http://dx.doi.org/10.2139/ssrn.1648623

Adeyemi, S.B. (2005), "The impact of accounting standard on financial reporting", Internal University of Lagos report, unpublished.

Alan, R.J. and Welker, M. (2001), "Social disclosure, financial disclosure and the cost of equity capital", *Accounting, Organizations and Society*, Vol. 26 No. 7, pp. 597-616.

Al-Matari, E.M., Al Swidi, A.K. and Fadzil, F.H.B. (2014), "The moderating effect of board diversity on the relationship between executive committee characteristics and firm performance in Oman: empirical study", *Asian Social Science*, Vol. 10 No. 12.

Al-Matari, E.M., Fadzil, B. and Al-Swidi, A.K. (2014a), "The moderating effect of board diversity on the relationship between audit committee characteristics and firm performance in Oman: empirical study", *Middle East Journal of Scientific Research*, Vol. 21 No. 5, pp. 792-801.

Al-Matari, E.M., Fadzil, B. and Al-Swidi, A.K. (2014b), "The moderating effect of board diversity on the relationship between board of directors characteristics and firm performance in Oman: empirical study", *Middle East Journal of Scientific Research*, Vol. 21 No. 5, pp. 782-791.

Amihud, Y. and Mendelson, H. (1986), "Asset pricing and the bid-ask spread", *Journal of Financial Economics*, Vol. 17 No. 2, pp. 223-249.

An, Y., Davey, H. and Eggleton, I.R.C. (2011), "Towards a comprehensive theoretical framework for voluntary IC disclosure", *Journal of Intellectual Capital*, Vol. 12 No. 4, pp. 571-585.

Anam, O.A., Fatima, A.H. and Majdi, A.R.H. (2011), "Effects of intellectual capital information disclosed in annual reports on market capitalization: evidence from Bursa Malaysia", *Journal of Human Resource Costing & Accounting*, Vol. 15 No. 2, pp. 85-101.

Anam, O.A., Fatima, A.H. and Majdi, A.R.H. (2012), "Determinants of intellectual capital reporting: evidence from annual reports of Malaysian listed companies", *Journal of Accounting in Emerging Economies*, Vol. 2 No. 2, pp. 119-139.

Arellano, M. and Bond, S. (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *The Review of Economic Studies*, Vol. 58 No. 2, pp. 277-297.

Arellano, M. and Bover, O. (1995), "Another look at the instrumental variable estimation of error-components models", *Journal of Econometrics*, Vol. 68 No. 1, pp. 29-51.

Baltagi, B. (2008), *Econometric Analysis of Panel Data*, John Wiley & Sons.

Bantel, K.A. and Jackson, S.E. (1989), "Top management and innovations in banking: does the composition of the top team make a difference?", *Strategic Management Journal*, Vol. 10 No. S1, pp. 107-124.

Barry, C.B. and Brown, S.J. (1985), "Differential information and security market equilibrium", *Journal of Financial and Quantitative Analysis*, Vol. 20 No. 4, pp. 407-422.

Ben-Amar, W., Francoeur, C., Hafsi, T. and Labelle, R. (2013), "What makes better boards? A closer look at diversity and ownership", *British Journal of Management*, Vol. 24 No. 1, pp. 85-101.

Beretta, S. and Bozzolan, S. (2004), "A framework for the analysis of firm risk communication", *The International Journal of Accounting*, Vol. 39 No. 3, pp. 265-288.

Bharadwaj, A.S., Bharadwaj, S.G. and Konsynski, B.R. (1999), "Information technology effects on firm performance as measured by Tobin's q", *Management Science*, Vol. 45 No. 7, pp. 1008-1024.

Black, E.L. and Maggina, A. (2016), "The impact of IFRS on financial statement data in Greece", *Journal of Accounting in Emerging Economies*, Vol. 6 No. 1, pp. 69-90.

Blundell, R. and Bond, S. (1998), "Initial conditions and moment restrictions in dynamic panel data models", *Journal of Econometrics*, Vol. 87 No. 1, pp. 115-143.

Blundell, R. and Bond, S. (2000), "GMM estimation with persistent panel data: an application to production functions", *Econometric Reviews*, Vol. 19 No. 3, pp. 321-340.

Bodie, Z., Kane, A. and Marcus, A.J. (2011), *Investment*, 9th ed., McGraw-Hill/Irwin, New York, NY.

Bontis, N. (1996), "There's a price on your head: managing intellectual capital strategically", *Business Quarterly*, Vol. 60 No. 4, pp. 40-78.

Bontis, N. (2001), "Assessing knowledge assets: a review of the models used to measure intellectual capital", *International Journal of Management Reviews*, Vol. 3 No. 1, pp. 41-60.

Bontis, N., Dragonetti, N.C., Jacobsen, K. and Roos, G. (1999), "The knowledge toolbox: a review of the tools available to measure and manage intangible resources", *European Management Journal*, Vol. 17 No. 4, pp. 391-402.

Botosan, C.A. (1997), "Disclosure level and the cost of equity capital", *Accounting Review*, Vol. 72 No. 3, pp. 323-349.

Botosan, C.A. (2006), "Disclosure and the cost of capital: what do we know?", *Accounting and Business Research*, Vol. 36 No. S1, pp. 31-40.

Botosan, C.A. and Plumlee, M.A. (2002), "A re-examination of disclosure level and the expected cost of equity capital", *Journal of Accounting Research*, Vol. 40 No. 1, pp. 21-40.

Botosan, C.A. and Plumlee, M.A. (2005), "Assessing alternative proxies for the expected risk premium", *The Accounting Review*, Vol. 80 No. 1, pp. 21-53.

Boujelbene, M.A. and Affes, H. (2013), "The impact of intellectual capital disclosure on cost of equity capital: a case of French firms", *Journal of Economics Finance and Administrative Science*, Vol. 18 No. 34, pp. 45-53.

Bounfour, A. (2002), "How to measure intellectual capital's dynamic value: the IC-dVAL approach", 5th World Congress on Intellectual Capital, McMaster University, Hamilton.

Bounfour, A. (2003), "The IC-dVAL approach", *Journal of Intellectual Capital*, Vol. 4 No. 3, pp. 396-413.

Bowen, R., Chen, X. and Cheng, Q. (2008), "Analyst coverage and the cost of raising equity capital: evidence from underpricing of seasoned equity offerings", *Contemporary Accounting Research*, Vol. 25 No. 3, pp. 657-699.

Bozzolan, S., Favotto, F. and Ricceri, F. (2003), "Italian annual intellectual capital disclosure: an empirical analysis", *Journal of Intellectual Capital*, Vol. 4 No. 4, pp. 543-558.

Brennan, N. and Connell, B. (2000), "Intellectual capital: current issues and policy implications", *Journal of Intellectual Capital*, Vol. 1 No. 3, pp. 206-240.

Brooking, A. (1996), *Intellectual Capital: Core Asset for the Third Millennium*, Cengage Learning EMEA, London.

Burke, R.J. (1997), "Women directors: selection, acceptance and benefits of board membership", *Corporate Governance: An International Review*, Vol. 5 No. 3, pp. 118-125.

Carroll, R.F. and Tansey, R.R. (2000), "Intellectual capital in the new internet economy – its meaning, measurement and management for enhancing quality", *Journal of Intellectual Capital*, Vol. 1 No. 4, pp. 296-311.

Carter, D.A., Simkins, B.J. and Simpson, W.G. (2003), "Corporate governance, board diversity, and firm value", *Financial Review*, Vol. 38 No. 1, pp. 33-53.

Certo, S.T. and Semadeni, M. (2006), "Strategy research and panel data: evidence and implications", *Journal of Management*, Vol. 32 No. 3, pp. 449-471.

Chang, S. (2007), "Valuing intellectual capital and firms' performance: modifying value added intellectual coefficient (VAIC™) in Taiwan IT industry", unpublished thesis (Doctoral of Business Administration Program), Golden Gate University.

Christensen, H.B., Lee, E. and Walker, M. (2007), "Cross-sectional variation in the economic consequences of international accounting harmonization: the case of mandatory IFRS adoption in the UK", *The International Journal of Accounting*, Vol. 42 No. 4, pp. 341-379.

Clarke, M., Seng, D. and Whiting, R.H. (2011), "Intellectual capital and firm performance in Australia", *Journal of Intellectual Capital*, Vol. 12 No. 4, pp. 505-530.

Coffey, B.S. and Wang, J. (1998), "Board diversity and managerial control as predictors of corporate social performance", *Journal of Business Ethics*, Vol. 17 No. 14, pp. 1595-1603.

Confab (2014), "The National Conference main report" Premium Times, 2014, available at: http://media.premiumtimesng.com/nationalconference/wp-content/uploads/National-Conference-2014Report-August-2014-Table-of-Contents-Chapters-1-7.pdf

Crano, W.D. and Chen, X. (1998), "The leniency contract and persistence of majority and minority influence", *Journal of Personality and Social Psychology*, Vol. 74 No. 6, pp. 1437-1450.

Daily, C.M. and Dalton, D.R. (2003), "Women in the boardroom: a business imperative", *Journal of Business Strategy*, Vol. 24 No. 5, available at: https://doi.org/10.1108/jbs.2003.28824eaf.002

Deegan, C. and Rankin, M. (1997), "The materiality of environmental information to users of annual reports", *Accounting, Auditing & Accountability Journal*, Vol. 10 No. 4, pp. 562-583.

Diamond, D.W. and Verrecchia, R.E. (1991), "Disclosure, liquidity, and the cost of capital", *The Journal of Finance*, Vol. 46 No. 4, pp. 1325-1359.

Douma, S., George, R. and Kabir, R. (2006), "Foreign and domestic ownership, business groups, and firm performance: evidence from a large emerging market", *Strategic Management Journal*, Vol. 27 No. 7, pp. 637-657.

Dumay, J. and Cai, L. (2014), "A review and critique of content analysis as a methodology for inquiring into IC disclosure", *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 264-290.

Easton, P.D. (2004), "PE ratios, PEG ratios, and estimating the implied expected rate of return on equity capital", *The Accounting Review*, Vol. 79 No. 1, pp. 73-95.

Eccles, R.G., Herz, R.H., Keegan, E.M. and Phillips, D.M. (2002), *The ValueReporting Revolution: Moving Beyond the Earnings Game*, John Wiley & Sons, London.

Edvinsson, L. (1997), "Developing intellectual capital at Skandia", *Long Range Planning*, Vol. 30 No. 3, pp. 366-373.

Edvinsson, L. and Malone, S.M. (1997), *Intellectual Capital: Realizing Your Company's True Value by Finding its Hidden Brainpower*, HarperBusiness, New York, NY.

El Ghoul, S., Guedhami, O., Kwok, C.C. and Mishra, D.R. (2011), "Does corporate social responsibility affect the cost of capital?", *Journal of Banking & Finance*, Vol. 35 No. 9, pp. 2388-2406.

El Ghoul, S., Guedhami, O., Ni, Y., Pittman, J. and Saadi, S. (2012), "Does religion matter to equity pricing?", *Journal of Business Ethics*, Vol. 111 No. 4, pp. 491-518.

Erhardt, N.L., Werbel, J.D. and Shrader, C.B. (2003), "Board of director diversity and firm financial performance", *Corporate Governance: An International Review*, Vol. 11 No. 2, pp. 102-111.

Espinosa, M. and Trombetta, M. (2007), "Disclosure interactions and the cost of equity capital: evidence from the Spanish continuous market", *Journal of Business Finance & Accounting*, Vol. 34 Nos 9-10, pp. 1371-1392.

Fama, E.F. (1980), "Agency problems and the theory of the firm", *Journal of Political Economy*, Vol. 88 No. 2, pp. 288-307.

Fama, E.F. and French, K.R. (1993), "Common risk factors in the returns on stocks and bonds", *Journal of Financial Economics*, Vol. 33 No. 1, pp. 3-56.

Field, A. (2013), *Discovering Statistics Using IBM SPSS Statistics*, 3rd ed., Sage, London.

Finkelstein, S. and Hambrick, D.C. (1990), "Top-management-team tenure and organizational outcomes: the moderating role of managerial discretion", *Administrative Science Quarterly*, pp. 484-503.

Firer, S. and Williams, S.M. (2003), "Intellectual capital and traditional measures of corporate performance", *Journal of Intellectual Capital*, Vol. 4 No. 3, pp. 348-360.

Francis, J. and Schipper, K. (1999), "Have financial statements lost their relevance?", *Journal of Accounting Research*, Vol. 37 No. 2, pp. 319-352.

Gabriel, S.C. and Baker, C.B. (1980), "Concepts of business and financial risk", *American Journal of Agricultural Economics*, Vol. 62 No. 3, pp. 560-564.

Galbreath, J. (2005), "Which resources matter the most to firm success? An exploratory study of resource-based theory", *Technovation*, Vol. 25 No. 9, pp. 979-987.

Gamerschlag, R. (2013), "Value relevance of human capital information", *Journal of Intellectual Capital*, Vol. 14 No. 2, pp. 325-345.

García-Meca, E., Parra, I., Larrán, M. and Martínez, I. (2005), "The explanatory factors of intellectual capital disclosure to financial analysts", *European Accounting Review*, Vol. 14 No. 1, pp. 63-94.

Gietzmann, M. and Ireland, J. (2005), "Cost of capital, strategic disclosures and accounting choice", *Journal of Business Finance & Accounting*, Vol. 32 Nos 3-4, pp. 599-634.

Gujarati, D.N. and Porter, D. (2009), *Basic Econometrics*, McGraw-Hill International, Washington, D.C.

Guthrie, J. and Petty, R. (2000), "Intellectual capital: Australian annual reporting practices", *Journal of Intellectual Capital*, Vol. 1 No. 3, pp. 241-251.

Guthrie, J., Petty, R. and Ricceri, F. (2006), "The voluntary reporting of intellectual capital: comparing evidence from Hong Kong and Australia", *Journal of Intellectual Capital*, Vol. 7 No. 2, pp. 254-271.

Hail, L. (2002), "The impact of voluntary corporate disclosures on the *ex ante* cost of capital for Swiss firms", *European Accounting Review*, Vol. 11 No. 4, pp. 741-773.

Haji, A.A. and Ghazali, N.A.M. (2012), "Intellectual capital disclosure trends: some Malaysian evidence", *Journal of Intellectual Capital*, Vol. 13 No. 3, pp. 377-397.

Haji, A.A. and Mubaraq, S. (2012), "The trends of intellectual capital disclosures: evidence from the Nigerian banking sector", *Journal of Human Resource Costing & Accounting*, Vol. 16 No. 3, pp. 184-209.

Hambrick, D.C. (2007), "Upper echelons theory: an update", *Academy of Management Review*, Vol. 32 No. 2, pp. 334-343.

Hambrick, D.C. and Finkelstein, S. (1987), "Managerial discretion: a bridge between polar views of organizational outcomes", *Research in Organizational Behavior*, Vol. 9 No. 1, pp. 369-406.

Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: the organization as a reflection of its top managers", *Academy of Management Review*, Vol. 9 No. 2, pp. 193-206.

Hambrick, D.C., Cho, T.S. and Chen, M.-J. (1996), "The influence of top management team heterogeneity on firms' competitive moves", *Administrative Science Quarterly*, Vol. 41 No. 4, pp. 659-684.

Hao, C.L. and Shih, C.-T. (2008), "How executive SHRM system links to firm performance: the perspectives of upper echelon and competitive dynamics[†]", *Journal of Management*, Vol. 34 No. 5, pp. 853-881.

Hilary, G. and Hui, K.W. (2009), "Does religion matter in corporate decision making in America?", *Journal of Financial Economics*, Vol. 93 No. 3, pp. 455-473.

Hill, R.C., Griffiths, W.E. and Lim, G.C. (2011), *Principles of Econometrics*, 4th ed., John Wiley & Sons, Inc.

Hinton, P.R., Brownlow, C., McMurray, I. and Cozens, B. (2004), *SPSS Explained*, Taylor & Francis, New York, NY.

Hsu, Y.-H. and Fang, W. (2009), "Intellectual capital and new product development performance: the mediating role of organizational learning capability", *Technological Forecasting and Social Change*, Vol. 76 No. 5, pp. 664-677.

Hudson, W.J. (1993), *Intellectual Capital: How to Build it, Enhance it, Use it*, Wiley.

Ibikunle, J. and Damagum, Y.M. (2013), "The impact of board mechanisms on intellectual capital disclosures in Nigeria", *The Journal of Accounting and Management*, Vol. 3 No. 1, pp. 10-21.

Ittner, C.D. and Larcker, D.F. (1998), "Are nonfinancial measures leading indicators of financial performance? An analysis of customer satisfaction", *Journal of Accounting Research*, Vol. 36 No. 3, pp. 1-35.

Johanne, G., Stephen, B. and Bruce, R. (2007), "Board diversity in the United Kingdom and Norway: an exploratory analysis", *Business Ethics: A European Review*, Vol. 16 No. 4, pp. 344-357.

Joia, L.A. (2000), "Measuring intangible corporate assets: linking business strategy with intellectual capital", *Journal of Intellectual Capital*, Vol. 1 No. 1, pp. 68-84.

Kakani, R.K., Saha, B. and Reddy, V.N. (2001), "Determinants of financial performance of Indian corporate sector in the post-liberalization era: an exploratory study", National Stock Exchange of India Limited, NSE Research Initiative Paper No. 5.

Kantudu, A.S. (2005), "The degree of compliance with the requirement of information to be disclosed in financial statement by listed firms in Nigeria", *Abuja management Review*, Vol. 3 No. 1, pp. 26-46.

Keasey, K., Thompson, S. and Wright, M. (1998), "Corporate governance, economic, management, and financial issues", *Managerial Auditing Journal*, Vol. 13 No. 6, pp. 390-391.

Keenan, J. and Aggestam, M. (2001), "Corporate governance and intellectual capital-some conceptualisations", *Corporate Governance*, Vol. 9 No. 4, pp. 259-275.

Keeney, R.L. and Keeney, R.L. (2009), *Value-Focused Thinking: A Path to Creative Decisionmaking*, Harvard University Press.

Kennedy, P. (2008), *A Guide to Econometrics*, 6 ed., Wiley-Blackwell, NJ.

Khurana, I.K. and Raman, K. (2004), "Litigation risk and the financial reporting credibility of big 4 versus non-big 4 audits: evidence from Anglo-American countries", *The Accounting Review*, Vol. 79 No. 2, pp. 473-495.

Knight, D., Pearce, C.L., Smith, K.G., Olian, J.D., Sims, H.P., Smith, K.A. and Flood, P. (1999), "Top management team diversity, group process, and strategic consensus", *Strategic Management Journal*, Vol. 20 No. 5, pp. 445-465.

Kristandl, G. and Bontis, N. (2007), "The impact of voluntary disclosure on cost of equity capital estimates in a temporal setting", *Journal of Intellectual Capital*, Vol. 8 No. 4, pp. 577-594.

Leuz, C. and Verrecchia, R.E. (2000), "The economic consequences of increased disclosure", *Journal of Accounting Research*, Vol. 38 No. 2, pp. 91-124.

Lev, B. (2000), *Intangibles: Management, Measurement, and Reporting*, Brookings Institution Press, Washington D.C.

Lev, B. and Sougiannis, T. (1996), "The capitalization, amortization, and value-relevance of R&D", *Journal of Accounting and Economics*, Vol. 21 No. 1, pp. 107-138.

Lev, B. and Zambon, S. (2003), "Intangibles and intellectual capital: an introduction to a special issue", *European Accounting Review*, Vol. 12 No. 4, pp. 597-603.

Lev, B. and Zarowin, P. (1999), "The boundaries of financial reporting and how to extend them (digest summary)", *Journal of Accounting Research*, Vol. 37 No. 2, pp. 353-385.

Lewellen, W.G. and Badrinath, S. (1997), "On the measurement of Tobin's", *Journal of Financial Economics*, Vol. 44 No. 1, pp. 77-122.

Loukil, N. and Yousfi, O. (2012), "Firm's information environment and stock liquidity: evidence from Tunisian context", *Journal of Accounting in Emerging Economies*, Vol. 2 No. 1, pp. 30-49.

Luo, Y., Xue, Q. and Han, B. (2010), "How emerging market governments promote outward FDI: experience from China", *Journal of World Business*, Vol. 45 No. 1, pp. 68-79.

Luthy, D.H. (1998), "Intellectual capital and its measurement", *Proceedings of the Asian Pacific Interdisciplinary Research in Accounting Conference (APIRA), Citeseer, Osaka*, pp. 16-17.

Lynn, B. (1998), "Intellectual capital: key to value-added success in the next millennium", *CMA Magazine*, Vol. 72 No. 1, pp. 10-15.

McGuire, S.T., Omer, T.C. and Sharp, N.Y. (2012), "The impact of religion on financial reporting irregularities", *The Accounting Review*, Vol. 87 No. 2, pp. 645-673.

Mahamad, T. and Salman, R.T. (2011), "Intellectual capital reporting in Nigeria: a way forward", available at: www.aibuma.org/abstract.php?value=101 (accessed January, 2015).

Mangena, M., Pike, R.H. and Li, J. (2010), *Intellectual Capital Disclosure Practices and Effects on the Cost of Equity Capital: UK Evidence*, Institute of Chartered Accountants of Scotland, Edinburgh.

Marr, B. and Chatzkel, J. (2004), "Intellectual capital at the crossroads: managing, measuring, and reporting of IC", *Journal of Intellectual Capital*, Vol. 5 No. 2, pp. 224-229.

Marr, B. and Schiuma, G. (2001), "Measuring and managing intellectual capital and knowledge assets in new economy organisations", *Handbook of Performance Measurement*, pp. 1-30.

Maznevski, M.L., Gomez, C.B., DiStefano, J.J., Noorderhaven, N.G. and Wu, P.-C. (2002), "Cultural dimensions at the individual level of analysis the cultural orientations framework", *International Journal of Cross Cultural Management*, Vol. 2 No. 3, pp. 275-295.

Megna, P. and Klock, M. (1993), "The impact of intangible capital on Tobin's q in the semiconductor industry", *The American Economic Review*, Vol. 83 No. 2, pp. 265-269.

Meritum, P. (2002), "Guidelines for managing and reporting on intangibles (Intellectual capital report)", European Union, Copenhagen Business School (Denmark), the Research Institute of the Finnish Economy and the Swedish School of Economics and Business Administration (Finland), Groupe HEC (France), Norwegian School of Management (Norway), IADE-Autonomous University of Madrid and the University of Seville (Spain - Coordinator), and Stockholm University (Sweden), available at: www.pnbukh.com/site/files/pdf_filer/MERITUM_Guidelines.pdf (accessed July 15, 2016).

Morris, R.D. (1987), "Signalling, agency theory and accounting policy choice", *Accounting and Business Research*, Vol. 18 No. 69, pp. 47-56.

Neu, D., Warsame, H. and Pedwell, K. (1998), "Managing public impressions: environmental disclosures in annual reports", *Accounting, Organizations and Society*, Vol. 23 No. 3, pp. 265-282.

Ntim, C. (2015), "Board diversity and organizational valuation: unravelling the effects of ethnicity and gender", *Journal of Management & Governance*, Vol. 19 No. 1, pp. 167-195.

Ofo, N. (2010), "Corporate governance in Nigeria: prospects and problems", SSRN, available at: https://ssrn.com/abstract=1937896; http://dx.doi.org/10.2139/ssrn.1937896

Ofo, N. (2011), "Code of corporate governance in Nigeria 2011: its fourteen fortes and faults", SSRN, available at: https://ssrn.com/abstract=1937896; http://dx.doi.org/10.2139/ssrn.1937896

Oghuma, R. and Iyoha, F. (2006), "Compliance with accounting standards by quoted insurance companies in Nigeria: an empirical investigation", *Nigerian Journal of Education Research*, Vol. 7 No. 2, pp. 18-27.

Okpala, P.O. and Chidi, O.C. (2010), "Human capital accounting and its relevance to stock investment decisions in Nigeria", *European Journal of Economics, Finance and Administrative Sciences*, Vol. 21 No. 21, pp. 64-76.

Oliveira, L., Rodrigues, L.L. and Craig, R. (2006), "Firm-specific determinants of intangibles reporting: evidence from the Portuguese stock market", *Journal of Human Resource Costing & Accounting*, Vol. 10 No. 1, pp. 11-33.

Oliveras, E., Gowthorpe, C., Kasperskaya, Y. and Perramon, J. (2008), "Reporting intellectual capital in Spain", *Corporate Communications: An International Journal*, Vol. 13 No. 2, pp. 168-181.

Orens, R., Aerts, W. and Lybaert, N. (2009), "Intellectual capital disclosure, cost of finance and firm value", *Management Decision*, Vol. 47 No. 10, pp. 1536-1554.

Petty, R. and Guthrie, J. (2000), "Intellectual capital literature review: measurement, reporting and management", *Journal of Intellectual Capital*, Vol. 1 No. 2, pp. 155-176.

Rodgers, W. (2007), "Problems and resolutions to future knowledge-based assets reporting", *Journal of Intellectual Capital*, Vol. 8 No. 2, pp. 205-215.

Roodman, D. (2008), "How to do xtabond2: an introduction to difference and system GMM in Stata", *The Stata Journal*, Vol. 9 No. 103, pp. 86-136.

Roos, G. and Roos, J. (1997), "Measuring your company's intellectual performance", *Long Range Planning*, Vol. 30 No. 3, pp. 413-426.

Roos, J. (1998), "Exploring the concept of intellectual capital (IC)", *Long Range Planning*, Vol. 31 No. 1, pp. 150-153.

Roos, J., Roos, G., Dragonetti, N.C. and Edvinsson, L. (1997), "Intellectual capital. Navigating in the new business landscape".

Roslender, R. and Fincham, R. (2001), "Thinking critically about intellectual capital accounting", *Accounting, Auditing & Accountability Journal*, Vol. 14 No. 4, pp. 383-399.

Salman, R.T., Mansor, M., Babatunde, A.D. and Tayib, M. (2012), "Impact of intellectual capital on return on asset in Nigerian manufacturing companies", *Interdisciplinary Journal of Research in Business*, Vol. 2 No. 4, pp. 21-30.

Sang, K.H. and Taylor, D. (2014), "Intellectual capital vs the book-value of assets: a value-relevance comparison based on productivity measures", *Journal of Intellectual Capital*, Vol. 15 No. 1, pp. 65-82.

Schultz, E.L., Tan, D.T. and Walsh, K.D. (2010), "Endogeneity and the corporate governance-performance relation", *Australian Journal of Management*, Vol. 35 No. 2, pp. 145-163.

Shiu, H.-J. (2006), "The application of the value added intellectual coefficient to measure corporate performance: evidence from technological firms", *International Journal of Management*, Vol. 23 No. 2, pp. 356-365.

Siagian, F., Siregar, S.V. and Rahadian, Y. (2013), "Corporate governance, reporting quality, and firm value: evidence from Indonesia", *Journal of Accounting in Emerging Economies*, Vol. 3 No. 1, pp. 4-20.

Singh, I. and Mitchell Van der Zahn, J.L.W. (2008), "Determinants of intellectual capital disclosure in prospectuses of initial public offerings", *Accounting and Business Research*, Vol. 38 No. 5, pp. 409-431.

Stewart, T.A. (1997), *Intellectual Capital: The New Wealth of Nations*, Double Day, New York, NY.

Stewart, T.A. and Ruckdeschel, C. (1998), *Intellectual Capital: The New Wealth of Organizations*, Doubleday, New York, NY.

Sullivan, P.H. (2000), *Value Driven Intellectual Capital: How to Convert Intangible Corporate Assets into Market Value*, John Wiley & Sons, Inc., New York, NY.

Taliyang, S.M., Harun, R.J., Mustafa, N.H. and Mansor, M. (2014), "Intellectual capital disclosure and market capitalization", *International Journal of Business and Social Science*, Vol. 5 No. 10, pp. 96-102.

Uadiale, O.M. and Uwuigbe, U. (2011), "Intellectual capital and business performance: evidence from Nigeria", *Interdisciplinary Journal of Research in Business*, Vol. 1 No. 10, pp. 49-56.

Vafaei, A., Taylor, D. and Ahmed, K. (2011), "The value relevance of intellectual capital disclosures", *Journal of Intellectual Capital*, Vol. 12 No. 3, pp. 407-429.

Valentin, C. (2014), "Determinants of corporate financial performance", available at: www.dafi.asce.ro/revista/6/costeavalentin.pdf (accessed 13 May).

Van Horne, J.C. and Parker, G.G. (1967), "The random-walk theory: an empirical test", *Financial Analysts Journal*, Vol. 23 No. 6, pp. 87-92.

Van Staden, C.J. (1998), "The usefulness of the value added statement in South Africa", unpublished thesis (D Comm – unpublished), University of Pretoria.

Vergauwen, P.G.M.C. and Alem, F.J.C.V. (2005), "Annual report IC disclosures in The Netherlands, France and Germany", *Journal of Intellectual Capital*, Vol. 6 No. 1, pp. 89-104.

Verrecchia, R.E. (2001), "Essays on disclosure", *Journal of Accounting and Economics*, Vol. 32 No. 1, pp. 97-180.

Watson, A., Shrives, P. and Marston, C. (2002), "Voluntary disclosure of accounting ratios in the UK", *The British Accounting Review*, Vol. 34 No. 4, pp. 289-313.

Weaver, G.R. and Agle, B.R. (2002), "Religiosity and ethical behavior in organizations: a symbolic interactionist perspective", *Academy of Management Review*, Vol. 27 No. 1, pp. 77-97.

Wellalage, N.H. and Locke, S. (2013), "Corporate governance, board diversity and firm financial performance: new evidence from Sri Lanka", *International Journal of Business Governance and Ethics*, Vol. 8 No. 2, pp. 116-136.

White, K.J. and Bui, L.T. (1988), *Basic Econometrics: A Computer Handbook Using SHAZAM: For Use with Gujarati: Basic Econometrics*, McGraw-Hill.

Whiting, R.H. and Miller, J.C. (2008), "Voluntary disclosure of intellectual capital in New Zealand annual reports and the 'hidden value'", *Journal of Human Resource Costing & Accounting*, Vol. 12 No. 1, pp. 26-50.

Williams, S.M. (2001), *Corporate Governance Diversity and its Impact on Intellectual Capital Performance in an Emerging Economy*, University of Calgary, Citeseer.

Wintoki, M.B., Linck, J.S. and Netter, J.M. (2012), "Endogeneity and the dynamics of internal corporate governance", *Journal of Financial Economics*, Vol. 105 No. 3, pp. 581-606.

Wooldridge, J.M. (2010), *Econometric Analysis of Cross Section and Panel Data*, MIT Press.

Xiao, J.Z., Yang, H. and Chow, C.W. (2004), "The determinants and characteristics of voluntary internet-based disclosures by listed Chinese companies", *Journal of Accounting and Public Policy*, Vol. 23 No. 3, pp. 191-225.

Zhou, S., Simnett, R. and Green, W. (2015), "Does integrated reporting matter to the capital market?", *Abacus*, Vol. 53 No. 1, pp. 94-132.

Further reading

Ahmed, A.H., Burton, B. and Dunne, T. (2017), "The determinants of corporate Internet reporting in Egypt: an exploratory analysis", *Journal of Accounting in Emerging Economies*, Vol. 7 No. 1, pp. 35-60.

Corresponding author
Mutalib Anifowose can be contacted at: mutalib.iium@gmail.com