THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL EFFICIENCY AND COMPANIES' PERFORMANCE AND ITS' DISCLOSURE IN NIGERIAN COMPANIES

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ABSTRACT

This study aims to investigate the relationship between intellectual capital (IC) efficiency and companies' performance and its disclosure through a sample of 117 companies in Nigeria over a period of six years. Many intellectual capital studies in developed countries have established links between intellectual capital efficiency and its disclosure of company performance particularly through educational qualification, training and salaries for human capital. Research and development (R&D), advertising, brand and information technology for structural capital were used to investigate the value added efficiency of IC. However, in developing countries like Nigeria, very little attention has been given to IC efficiency and its disclosure in relation to company performance. Therefore, in order to expand the existing intellectual capital efficiency studies this study includes welfare package, compensation cost and intellectual property (patent) to examine IC. Secondary data (annual reports) was sourced from fourteen sectors and tested through multiple regression analysis.

The findings of the study provide empirical evidence that intellectual efficiencies are significant and positively related to company performance. The study further reveals that there is a significant difference in the intellectual capital disclosure practice of the sampled companies. Thus, it is recommended that policies that will improve employees' capability and organizational structure should be given priority. This study contributes immensely to the field of intellectual capital. Firstly, it introduces Nigerian companies' intellectual capital efficiency and its disclosure features. Secondly, the study expands the Public (2004, 2000) VAIC method by including welfare package, compensation cost and intellectual property as drivers of values. Lastly and most importantly, to the best knowledge of this researcher, this is the first study which simultaneously considers the intellectual capital efficiency and its disclosure in fourteen sectors of the Nigeria economy.

Keywords: intellectual capital, value added, company performance, Nigeria.

ABSTRAK

Kajian ini bertujuan untuk mengkaji hubungan antara kecekapan modal intelek (IC) dengan prestasi syarikat dan pendedahannya melalui sampel 117 buah syarikat di Nigeria dalam tempoh enam tahun. Banyak kajian modal intelek di negara-negara maju memperlihatkan hubungan antara kecekapan modal intelek dan pendedahannya terhadap prestasi syarikat terutamanya melalui kelayakan pendidikan , latihan dan gaji bagi modal insan. Penyelidikan dan pembangunan (R & D), pengiklanan , jenama dan teknologi maklumat untuk modal struktur telah digunakan untuk menyelidik nilai tambah kecekapan IC . Walau bagaimanapun, di negara-negara membangun seperti Nigeria, sangat sedikit perhatian diberikan terhadap kecekapan IC dan pendedahannya berhubung dengan prestasi syarikat. Oleh itu , untuk memperluaskan kajian kecekapan modal intelek sedia ada, kajian ini turut melibatkan pakej kebajikan , kos pampasan dan harta intelek (paten) dalam meneliti IC. Data sekunder (Laporan tahunan) yang diperoleh daripada empat belas sektor, diuji melalui analisis regresi berganda. Hasil kajian memberikan bukti empirikal bahawa kecekapan intelek adalah penting dan berkait secara positif dengan prestasi syarikat. Seterusnya, kajian ini mendedahkan bahawa terdapat perbezaan yang ketara dalam amalan pendedahan modal intelek syarikat yang dijadikan sampel . Oleh itu , disyorkan agar dasar-dasar yang mampu meningkatkan kemampuan pekerja dan struktur organisasi perlu diberi keutamaan. Kajian ini memberikan sumbangan besar dalam bidang modal intelek. Pertama, kerana kajian ini memperkenalkan kecekapan modal intelek syarikat di Nigeria dan ciri-ciri pendedahannya . Kedua, memperluaskan kaedah VAIC Awam (2004 , 2000) dengan memasukkan pakej kebajikan, kos pampasan dan harta intelek sebagai pemacu nilai. Akhir sekali dan yang paling penting , merupakan ilmu paling berguna kepada penyelidik kerana ini adalah kajian pertama yang melibatkan kecekapan modal intelek dan pendedahannya secara serentak dalam empat belas sektor ekonomi di Nigeria .

Kata kunci: modal intelek , nilai tambah , prestasi syarikat , Nigeria

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DEDICATION

This thesis is dedicated to:
Allah (SWT) Who Gives, Shapes and protects the life of man;
My late father, Alhaji Mustapha Aremu Usman, and my mother, Alhaja Hawa Mustapha;
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TABLE OF CONTENT

LIST OF TABLES

Table **Pages**

LIST OF FIGURES

LIST OF ABBREVIATIONS

CIS	-	Change in Sales
FASB	-	Financial Accounting Standard Board
GAAP	-	Generally Accepted Accounting Principles
HC	-	Human Capital
IAS	-	International Accounting Standard
IC	-	Intellectual Capital
ICD	-	Intellectual Capital Disclosure
IASB	-	International Accounting Standard Board
IFAC	-	International Federations of Accountant
IFAS	-	International Financial Accounting Standard
IFRS	-	International Financial Reporting Standard
IT	-	Information Technology
MV	-	Market Value
NASB	-	Nigerian Accounting Standard Board
RC	-	Relational Capital
R&D	-	Research and Development
ROE	-	Return on Equity
ROA	-	Return on Assets
SAS	-	Statement of Accounting Standard
SC	-	Structural Capital
VAIC	-	Value Added Intellectual Coefficient

CHAPTER ONE

1.1 Introduction

In a knowledge-based and an increasingly more competitive economy, a company's Intellectual Capital (IC) is a fundamental determinant of its success. Intellectual capital is the combination of knowledge-based assets and intangible assets of a company which includes its patents, brand names, employee's skills, trade secret, technologies and information about consumers and supplies that has been utilised in order to create wealth by producing a higher value asset (Stewart, 1997). In the last two and half decades, the importance of intellectual capital has increased tremendously, specifically in the developed countries.

This is because the world at large has experienced a drastic change in the form of emerging wealthy business and nations (Arenas & Lavanderos, 2008). Both companies and governments shifted their focuses from tangible assets to intellectual capital (IC) as differentiators for the sustainable competitive advantage of businesses and nations (Sarmadi, 2013). The reason for paradigm shift is that IC assets contribute to shareholder value more that tangible assets. And as such companies must cope with the shift and take full advantage of IC resources to improve their performance and competitive advantage (Carrell, 2007). Of course, scholars have favoured this contention by asserting that intellectual capital has become one of the primary sources of competitive advantage for companies (Bontis 1998 & Edvinson, 1997).

However, traditional financial statements of companies do not reflect true disclosure of intellectual capital. In few instances, traditional intangible assets (e. g. research and development, good will and other internally developed assets) are recognised in the annual accounts of companies, but these assets are defined narrowly (Gallego &

Rodriguez, 2005). While on the other hand, modern intangible assets (IC) are not disclosed in companies' annual financial statement thereby making the role of IC in business to be insufficiently understood. Obviously, stakeholders (investors, creditors and financial analysts) will not be satisfied with non-disclosure of IC as this will lead to investors' difficulty of making rational investment decisions (Okwy & Christopher, 2010). Again, non-disclosure of IC in the companies' annual statements will reduce the value of their shares in the capital market. Therefore, it is imperative for companies to measure and report (disclose) their IC activities in their financial statement in other to enhance their performance. Against this backdrop, this research work is embarked upon to investigate the relationship between IC efficiency, IC and company performance of Nigerian companies.

1.2 Background Information to the Study

The twenty-first century is regarded as the era of information technology and as such the age of information economy. The information that is known and how such information is kept from a company's competitors is a critical determinant of that company's success. Such key information (knowledge) of the company as well as patent, copyrights, and brand name are intellectual capital. Thus, intellectual capital is the sum of the total knowledge that is possess by the company that can generate value for the company (Cantu, Bustani, Molina & Moreira, 2009) and provide the company with competitive advantage (Arenas & Lavanderos, 2008). Intellectual capital has become the pre-eminent operational resource and it is gradually replacing physical capital and financial capital as the most significant capital in the competitive economy brought about by globalization and technological advancement (Brannstrom & Giuliani, 2009; Chang & Hsieh, 2011; Hamzah & Ismail, 2008). Hence, company's intellectual capital is now seen as a major part of its operational

resources which showcase competitive advantage. Evidence abound that company's success can be partly explained by its IC efficiency and disclosure (Alipour, 2012; Hamzah & Ismail, 2008).

Apart from showcasing company's competitive advantage, researches indicate that 50 to 90% of value created by companies in the globalised economy is due to IC rather than production and sales (Ehrhardt, 2007; Makki, Suleman & Lodhi, 2009; Rahim, Atan & kamaluddin 2011). In the new economy, manufacturing and service companies are tailored towards knowledge wherein operational resources are 20% tangible and 80% intangible (IC) (Alipour, 2012; OECD, 2008).

These positions led to increasing interest in intellectual capital (efficiency) performance and its' disclosure in relation to company's success. Presently, there is a growing recognition that intellectual capital is an important determinant of company value, and the investment in intellectual capital helps to explain the rise or fall of value of any given company in the global market. The importance of intellectual capital as the major determinant of company success is not only been accepted in the developed countries but also in developing countries of the world like Nigeria, Malaysia and Singapore.

However, despite the significance of intellectual capital to the economy as a whole and to the individual company, the valuation of many IC drivers is difficult (Guthrie, 2001). This is because there has never been any consensus about their measurement (Guthrie, 2001; Lim & Damillore, 2004) which brought with it a high degree of uncertainty that is associated to its future benefit. For example, Statement of Financial Accounting Standard (SFAS) 2 meant for reporting research and development (R&D) by United States of America companies believes that R&D (a driver of IC) estimate cannot be measured reliably. And even if measured reliably, its

success cannot be guaranteed by managers. This can be gleaned from the statement of the Financial Accounting Standard Board (FASB) which states that;

> "….there is normally a high degree of uncertainty about the future benefits of individual research and development project, although the element of uncertainty may diminish as a project progresses. Estimates of the rate of success of research and development projects vary markedly depending in pat on how narrowly one defines a "project" and how one define "success" but all such estimates indicate a high failure rate. For example, one study of number of industries found that an average of less than two percent of new product ideas and less than 15 % of product development projects were commercially successful." (FASB, 1974, SFAS No. 2, para. 39, p10)"

The problem is further strengthened with assumption that even if the managers of companies believe that this investment can bring future benefit, they are faced with problem of measurement as FASB concluded that average R&D expenditure is not asset; citing the prior research failure in finding relationship between R&D expenditure and future benefit. Therefore, since intellectual capital cannot easily been measured; there is no way companies can adequately value it as part of operational resources (Guthrie, 2001; Lim & Damillore, 2004).

Apart from the problem of intellectual capital drivers' measurement, there is another major problem confronting the intellectual capital. The problem is lack of adequate reporting (non-disclosure) of intellectual capital in the annual financial statement of companies. That is, there is no reporting (disclosure) of all activities of companies (traditional "old" and emerging "new") for the users of accounting information. This problem stemmed out of the fact that presently there is no universally acceptable standard or indeed regulation on intellectual capital reporting (Abeysekera & Guthrie, 2005; Zainon, Atan, Wah & Ahmad, 2012). As a result of this, most companies are at liberty not to disclose their intellectual capital investment or disclose them the way they feel appropriate. In fact, the traditional "old" companies feel there is no needs for them to disclose their IC since they are not heavily rely on

it for their business operation like the emerging "new" companies, while the emerging "new" companies disclose their IC as they deemed fit. Inevitably, this leads to diverge in market-to-book value of their assets (both traditional "old" and emerging "new" companies. Despite the importance of IC to individual firm, information about many IC components drivers, particularly those developed internally is very limited in the current accounting standards of many nations as the problem is universal (Alipour, 2012; Calisir, Gumussory, Cirit & Bayraktaroglu, 2011; Firer & Williams, 2003; Moeller, 2009; Salamudin, Bakar, Ibrahim & Hassan, 2010).

In addition, intellectual capital investments like research and development (R&D), information technology, (IT), and advertising and human capital that generate potential future economic benefit are recorded as expenses in the investment period (Aboody & Lev, 1998; Edvinsson & Malone, 1997; Lev, 2001). Apart from R&D that International Financial Accounting Standard (IFAS) No 2, allowed to be disclosed in income statement in a separate line, no other internally generated IC information is allow to be disclosed in the financial statements (Abdolmohamadi, 2005; Anghal, 2008; Alipour, 2012; Maditinos, Chatzoudes, Tsairidis, & Theriou, 2011).

As earlier stated, problems of intellectual capital measurement and non-disclosure is universal. Nigeria has its share of these problems. The realisation of the importance of intellectual capital as the major determinant of company's success leads to increase in the investment of intellectual capital drivers by government and companies in Nigeria (Aduwa-Ogiegbaen & Iyamu, 2005). Before the oil boom of 70s in Nigeria, the Nigerian economy is dependent on agricultural and service

sectors. Due to the fact that Nigerian government realized its worth in crude oil, it neglects the hitherto main economic sectors (Salau, 1997).

The oil sectors continues to drive the economy with average growth of about 80% compared to -0.35% for the non-oil sectors (Okereke-Onyiuke, 2009) However, the oil sector in which Nigerian economy relied on is controlled by expatriates (as Nigeria lacks skilled employees to use modern technology to extract the crude oil). Despite the fact that Nigeria is blessed with huge natural and human resources, it lagged behind in terms of skilled workers (human capital) due to the brain drain witnessed in most developing countries (Beine, Docquirer & Rapoport, 2008).

Regrettably, the oil sector is experiencing set back from different perspective (Suraj & Bontis, 2012). Firstly, the three major refineries broke down almost the same time and Nigeria begins to import refined petroleum into the country with its attendant huge cost (Suraj & Bontis, 2012). Second, there is fall in the market price of cruel oil in the world market (Suraj & Bontis, 2012). Many oil producing nations continued to supply the United States which is the major buyer of Nigerian oil thus, the revenue from the oil sector fell short of the expectation. To address the situation, the government tries to diversify the economy by giving attention to agricultural and service sectors; by establishing staple-crop processing using modern technology to develop new product(seeding) and service; by training and development of employees (at home and abroad).[1]

For the newly developed and old sectors not to experience the set-back of the oil sector, Nigerian government equipped almost its ministries and schools with computers so that Nigerian employees can be IT compliant and be of world standard in term of quality of service they can rendered (Aduwa-Ogiegbaen & Iyamu, 2005).

[1] (www.africaneconomicoutlook.org/en/countries/west-africa/nigria/.

The multinational sector, financial sector, and manufacturing industries (sectors representing the Nigerian economy) are not left out in this policy. They have all engaged in innovative strategies such as R&D of new product and service, IT and advertising in order to meet the trend brought about by globalization and technological advancement so as to improve their performance in the global market. These investments by Nigerian government and companies are intellectual capital drivers that drive companies' performance. Again, for the country's economy to float in the challenges brought by globalization and technological advancement and to be a major player in the global market, governments and companies embraced investment in intellectual capital resources to improve corporate performance in the global market.

Having realised that investment in the intellectual capital resources (drivers) like research and development, information technology and advertisement represent are a growing proportion of world economy, companies and Nigerian government continue to invest billions of Naira[2] in training and development of the citizen and employees both home and abroad. This is because training and development is one of the human capital drivers to improve their skills. Expenditure on this project is enormous; millions of Naira has been expended. This expenditure doubled in 2007 which grossly affect non-financial corporate gross domestic product (GDP) (Suraji & Bontis, 2012).

According to a research estimation (Abdulai, Kwon & Moon 2012; Okwy & Christopher, 2010), the Nigeria gross investment in IC resources is at least one trillion Naira which is 6.17 US$[3] a year in order to revolutionised the country's economy and at the same time to improve company performance as company value

[2] Naira is the Nigerian currency
[3] 1 US$ is equivalent to 162 Naira

is now driven by its IC resource. However, there was no corresponding difference in investments of tangible resources such as plant and equipment. Despite this huge investment, Nigerian companies are regarded as worst in terms of performance in the global market (Okwy & Christopher, 2010). The question is what is responsible for the poor performance? The simple answer is that there is no intellectual capital valuation method to measure the IC drivers and no adequate disclosure of its IC (drivers) in the financial statement due to the fact that there has never been a consensus as to the reporting of IC drivers in the financial statement.

Attempts have been made at different time to solve the problem. For example, Nigerian Accounting Standard Board (NASB) released Statement of Accounting Standard (SAS) No 22 in 2006 to regulate the reporting of Research and development cost (Olaofe, 2006). But, the defect of SAS No 22 is that there is no standard on any other internally developed IC drivers as it only allows R&D cost to be expensed in the period of investment. This is notwithstanding that the problem of IC disclosure is not restricted only to R&D but to all internally developed IC drivers such as training and development cost, investments in IT and advertising. This is because all intellectual capital drivers are interconnected (Burt, 1997; Delery, 1998; Subramanian & Youndt, 2005; Yahaya, 2007).

Apparently, lack of measurement of intellectual capital led to non-disclosure of IC drivers by many companies in Nigeria. As expected, this led to sharp gap between market value and book value of their asset (Holland, 2009; Saenz, 2005). According to Okwy and Christopher (2010) and Suraj and Bonitis (2012) millions of naira are lost by Nigerian companies in the global market as the true value and their wealth capacities (IC) are not measured and disclosed in their annual reports. For example, Nigerian Breweries Plc invested more than N88 million in local and overseas

training and development of its employees as far back as 1988. In 2006, Unilever invested over N40 million in training and development of its employees; Access Bank Plc in 2007 constructed Access Bank Campus called Access University of Banking Excellence; and Wema Bank Plc invested huge amount on policy, training and development of its employees.

Surprisingly, these huge amounts of investments did not reflect in the balance sheet of these companies' annual reports because there is no regulation and neither are there standards on measurement method as well as IC disclosure framework. The present Nigerian Accounting Standards do not allow IC to be treated as asset and as such not mandated to be disclosed in the financial statement. This of course reduces their values in global market (Okwy & Christopher, 2010). Also, the reporting of this IC information is excluded in the present accounting standards, thus, denying companies to publicly provide the users (capital market players) with their true values and their wealth creation potentiality (Rahim et al. 2011).

Since intellectual capital drivers are yet to be measured adequate, disclosure of intellectual capital in the Nigerian companies becomes impossible and as such the success or otherwise of the companies is difficult to identify. This is because company's IC capability in relation to performance is measured based on all the components of IC that are present in production resource of a company (Olaofe, 2006). Therefore, it goes without saying that Nigerian companies are faced with series of problem borne out of failure to measure, value and report intellectual capital drivers appropriately (Okwy & Christopher, 2010). Such problems include devaluation of share price, investors interest not protected, difficulty in making rational investment decision by investors and inappropriate/incomplete management tool for corporate decisions (Okwy & Christopher, 2010; Yahaya, 2007). This shows

glaring defects and shortcoming in conveying the true value of asset invested in the financial statement of companies in Nigeria.

This trend should not continue as capital market players are increasingly asking question about the "gap" between accounting and market value of companies (Ballow, Burgman, Roos & Molnar, 2004; Lev, 2001; Salamudin et al. 2010). They are requesting for information beyond the profit and loss and balance sheets of companies in order to assess companies' performance and share price value (Salamudin et al. 2010; Lev, 2001). To provide answers to stakeholders, Nigerian companies' intellectual capital drivers deserve to be investigated with utmost interest to suggest possible solution. Thus, this study examines the intellectual capital's efficiency in relation to company performance and IC disclosure of Nigerian companies.

1.3 Problem Statement

Due to many factors, Nigerian government and companies (traditional "old" companies and emerging "new" companies) increases its IC investments in order to improve the financial performance, create value and sustain environment for competitive global advantages. Along this line, Nigerian Accounting Standard Board (NASB) released Statement of Accounting Standard 22 (Statement of Accounting Standard for disclosing R&D). This notwithstanding, intellectual capital drivers are not adequately measured by companies in Nigeria. Also there is disparity in intellectual capital disclosure of traditional "old" companies and emerging "new" companies (Abdolmohammadi, 2005) because of their nature and intellectual capital intensity (Suraj & Bontis, 2012).

Since intellectual capital is not properly measure, the intellectual capital is either inadequately reported (disclose) or not reported at all. Since there is difference in the

intellectual capital intensity of traditional “old” or emerging “new” companies because they place different value on IC.

Since there is no adequate disclosure of intellectual capital in the annual financial statement, it is difficult to measure performance in relation to intellectual capital investments.

Since there is no adequate disclosure of intellectual capital in the annual financial statement the investors are denied adequate information necessary to take investment decision.

And since investment decisions could not be made, it cost businesses loss of revenue in millions of Naira yearly (Sudarsanam, Sorwar, & Marr, 2006; Suraj and Bontis, 2012).

Due to the aforementioned problems and due to the importance attached to intellectual capital, its’ measurement, valuation and disclosure this research work becomes imperative.

1.4 Research Questions

In view of the above problems, the following questions put forward in order to provide solutions to the stated research problems. The questions are:

1. Does intellectual capital efficiency relate to company performance?
2. What is the Intellectual capital disclosure (ICD) practice of Nigerian companies?
3. Is there any difference in intellectual capital disclosure practice between the traditional “old” and emerging “new” companies?
4. Is there any difference between intellectual capital disclosure performance “before” and “after” the issuance of SAS 22?

1.5 Research Objectives

In view of the above research questions, the main objective of this study is to examine the relationship between intellectual capital efficiency with companies' performance in Nigeria. The following are the specific objectives of this study.

1. To analyse the relationship between intellectual capital efficiency and company performance.
2. To investigate the Intellectual capital disclosure (ICD) practices of Nigerian companies.
3. To examine the difference in intellectual capital disclosure practice between the traditional "old" and emerging "new" companies
4. To examine the difference between intellectual capital disclosure performance "before" and "after" the issuance of SAS 22

1.6 Scope of the Study

The focus of this study is to examine the relationship between intellectual capital efficiency and companies' performance in Nigeria. To examine the ICD practice and ICD performance, this research work is limited to voluntary IC components present in the annual reports (2004 and 2005, 2007 and 2008) of 117 public listed companies in Nigeria. The study is also limited in scope to IC drivers chosen to measure the IC efficiency (2007 to 2010) of 117 public listed companies in the Nigerian Stock Exchange. Lastly, the study assumed that all other factors influencing performance are constant. The list of the sampled companies is in appendix D.

1.7 Significance of the Research

Firstly, the most significant of this research is the introduction of Nigerian companies' intellectual capital disclosure practice and intellectual capital efficiency (performance) features to the field of intellectual capital studies. It is a significant contribution to Nigeria in particular because over the years, researchers on intellectual capital have paid greater attention to the developed countries. Very few

studies have emerged from developing countries generally and Nigeria in particular. Empirical evidence shows that the understanding and development of IC concepts in emerging economies is still very much at its infancy. Thus, this study builds on the scanty literature on IC concepts in the developing countries.

Secondly, it is worthy of note that intellectual capital continues to gain popularity as a major resource in factor of production that exhibits competitive advantage specifically in the developed countries. However, it is a relatively recent development in developing countries with its attendant measurement problem and inadequate regulatory framework (Ahangar, 2011; Kamukama, Ahiauzu, & Ntayi, 2010). Despite its measurement and disclosure problem, its existence as pivotal of company's competitiveness in the global market could have positive implication on company's performance (Maditinos et al. 2011; Ting & Lean, 2009). Hence, this study contributes to empirical literature on intellectual capital in developing countries by investigating the relationship between intellectual capital efficiency in relation to company performance in Nigeria.

Furthermore, there is an empirical support of Barney (1991) resource-based theory which advanced that the firm-specific advantage is three to four times more value-relevant than the industry specific advantage. In line with this theory, this study reveals the efficiency of intellectual capital efficiency thus, giving a clue to the company management the need to manage, and nurture their IC for their sustainability. Hence, this is another major contribution of this study.

In the same token, the study provides evidence that human capital is a pillar upon which all other resources of an organization rest. This is in line with earlier submissions of researchers like Bontis, (2004); Sveiby, (2007). The study reveals that higher success and profitability of a company might be accomplished by the

employees (Okwy & Chritopher, 2010; Stewart, 1997). Apart from theoretical contributions, this study contributes immensely to the practical aspect of IC efficiency measurement. The study provides evidence on the usefulness of value added intellectual coefficient (VAIC) method in evaluating the IC resources of Nigerian companies. The study shows the useful measurement tools that can be applied to measure the efficiency use of IC resources of companies. This helps the management in minimizing the trouble of how to measure the value added of IC components in Nigerian companies, thus making IC disclosure easier.

In the new economic era, intellectual capital constitutes a major part of production resources (OECD, 2008; Salamudin et al. 2010). The study may guide the management of these sampled companies on how to allocate fund. The intellectual capital efficiency could be relevant in this regard. The allocation of resources could be apportioned according to intellectual capital component efficiency. Furthermore, it could be used to measure the overall contribution of sectors toward economy growth. This result may also inform policy decision involving the investment decision by the government. Invariably, this study has immersed contributions on issues of intellectual capital asset-based performance. And as such, it is believed that this study will be useful to the policy makers and regulators in making informed decision and formulating policies that will indeed contribute to the bottom line of IC measurement, disclosure and valuation. Finally, this study also serves as a base for future research on IC studies and a guide for evaluating firm's performance.

1.8 Organisation of Chapters

This research work is divided into seven chapters. Chapter one gives general introduction and covers background of the study, problem statement, research questions, research objectives, scope of the study, significance of the study and organization of the chapters. Chapter two discusses the prior literature relating to the

research, conceptual framework, measurement tools and relevant theory. Chapter three discusses research framework and research hypotheses developed. While chapter four outlines the research methodology employed, chapter five on the other hand shows the data analysis procedure. Findings of a research work of this nature is paramount, therefore chapter six discusses all the research findings. The last chapter which is chapter seven outlines the summary, conclusion, contribution, limitation of the study and future research.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter reviews literatures that are pertinent to this study. It contains an assessment of: (1) definitions of intellectual capital and its components; (2) reviews previous studies on intellectual capital efficiency, and company performance; (3) reviews of intellectual capital disclosure, (4) reviews intellectual capital measurement and (5) analysis the need for accounting regulatory environment for example IFRS and SAS 22. The review starts from the definition of IC.

2.2 Definition and Constituents of Intellectual Capital/Asset

Generally Accepted Accounting Practice (GAAP) defines assets as probable future economic benefits obtained or controlled by a particular entity. Assets are expenditures made by companies with the intention to earn future returns through enhanced profits and cash flows (Austin, 2007). Financial items such as receivables and investments which are claims for future benefits are regarded and included as assets even though they are not physical/tangible (Austin, 2007; Edvinsson & Malone, 1997; Lev, 2001). Assets could be classified as either tangible or intangible (Statement of Financial Accounting Concepts, No. 6, 1980; Statement of Accounting Standard 3, 1984).

The main concern of this study is intellectual capital which is known as knowledge-based asset, though, it includes all intangible assets. Literature abounds on the definition of intangible assets. For example, intangible asset is typically described as non-physical existence/ substance good or asset that has economic value (Berry 2004; Edvinsson & Malone, 1997; Gerpoth, Thomas & Hoffman, 2008) such as goodwill, brand and patent; which arise through business acquisition or merger with the emergence of corporate growth in early 1990s.

Later in 1990s, with the emergence of the new economy, intangible assets and knowledge-based assets were merged into what is now known and called "Intellectual Capital" (klm)[4]. Therefore, intellectual capital includes all intangible assets, such as brand, and all knowledge based assets such as human capital (employees' skill, knowledge, capabilities, experience), structural capital (patent, trademark, copyright, trade secret) and customer capital (company's external networking) (Lev, 2001).

The surge in the knowledge-based economy led to the recognition of intellectual capital as the most important asset an organization has for sustainability in the capital market (Aboody & Lev, 1998). Until now, a standard definition of intellectual capital (IC) has not been arrived at because scholars define it according to its basic parameters (Maditinos, Chatzoudes, Tsairidis & Theriou, 2011). Driven by the value individual or group of individual from different disciplines attached to it, different definitions emerged (Bontis, 1999; Edvinsson & Malone, 1997; Guthrie, 2001; Sveiby, 1997; Nazari, 2010).

Thus, "Accountants are interested in how to include it in financial statement; information technologists want to codify it on systems; sociologists want to balance power in organizations with it; psychologists want to develop minds because of it; human resource managers want to calculate ROI of employees on it; while training and development officers want to make sure that they can develop it" (Bontis, 1999).

It is against this background that Lev (2001), defines intellectual capital/assets as "a claim to future benefit that does not have a physical or financial (a stock or a bond) embodiment". Some researchers have defined it by its drivers. For example (Chan,

[4] KLM, Inc.® is a management consultation firm that specializes in strategic planning, brands, brand valuation, the monetization of intangible assets, intellectual property, legal strategy, knowledge management and the optimization of intellectual capital for companies, non-profit organizations, and government.

Lakonishok & Sougiannis, 2001; Gu & Lev, 2001; Stewart, 1998) describe this set of asset as R&D, Advertising, IT and Human resource. While Pablos (2003), simply puts it as the difference between market value and book value. From these definitions, it can be deduced that since company varies in nature definitely their intellectual capital is likely to vary according to each nature, regulatory environment and intensity (Abeysekera & Guthrie, 2005; Amir & Lev, 1996; Guthrie &Petty, 2000). As plausible as these definitions are, it is discovered that no widely accepted definition of intellectual capital has emerged (Gerpott et al. 2008). Generally, however, there is an agreement that IC covers three main capitals: human capital, structural capital and relational capital (Bontis, 2002; Edvinsson & Sullivan, 1996; Lynn, 1998; Stewart, 1997) among others other scholars. For a corporate survival in the knowledge-based economy era, measuring and valuing IC components performance is essential to the overall performance of a company (Aboody & Lev, 1998; Gerpott et al. 2008; Sarmadi, 2013).

This study adopted the definition of Austin, (2007); Lev, (2001); and Edvinsson and Malone, (1997) which defines IC as the financial investment with future benefits, because IC is financial investment which can be used as leading indicators of future financial performance which has three dimensions. The three main dimensions of capital are discussed below.

2.3 Intellectual Capital Components

Intellectual capital is generally accepted to have three components. These three components are: Human capital, structural capital and relational/customer capital. The details of these components are discussed below.

2.3.1 Human Capital

Human Capital (HC) is believed by some researchers and practitioners of IC to be a segment of the organization and seen by some as including components related to

humans. Some group considered it as what people are owned from learning, experience and skill, while another group delineated it as directly linked to the work (Al-Maani & Jeradat, 2010).

Accordingly, human capital is the estimation of value of the knowledge available to the organization, (Bontis & Fitz-enz, 2002). From another angle, HC is the body of knowledge owned by the organization and live in the minds of employees, and those who deal with the organization from outside (McGregor, Tweed, & Pechi, 2004). Organisation of Economic Cooperation Development (1999) believes human capital include knowledge, skills and competencies embodied in individuals and associated with their economy activity. Thus, it means what a single employee brings into the value adding processes, consisting of professional competence, social competence employee motivation, and leadership ability (Halim, 2010).

Although, organizations invest in the human capital such human capital does not belong to the organization (Nazari, 2010) owned by the employees (Roos, Roos, Dragonetti & Edvinsson, 1998), nevertheless it is a source of wealth for organization (Bontis, 1999) and its ability to be innovative (Ahangar, 2011). Therefore, Human capital can be simply put as learning, training, experience, knowledge, capabilities, capacities, creativity, and core competencies of human resources present in an organization. Going by Sveiby (1997) IC disclosure framework, human capital has seven attributes: Know-how, education, vocational qualification, work-related knowledge, work-related competencies, and entrepreneurial spirit. This human capital is used in this study as one of the IC component to measure its potentiality to create value.

2.3.2 Structural Capital

The second dimension of HC is Structural Capital (SC) which is the process, system, procedure and practice of organizations used by the employees (Boisot 2002;

Ordonez de Pablos, 2004). This dimension is viewed by Maheran and Khairu (2009), as competitive intelligence, formulas, information systems, patents, policies and others which resulted from the products or systems the company has created over time. Structural capital is the supportive infrastructure for human capital and unlike human capital, it is owned by the company which can be traded, reproduced and shared by, and within, the organization (Ahangar, 2011). Structural capital is referred to as organizational capital by (Hall, 1992; Itami, 1987; OECD, 1999; Walsh & Ungson, 1991).

Organizational capital represents institutionalized knowledge and codified experience stored in databases, routines, patents, manuals, structures and the like (Hall, 1992; Itami, 1987; Walsh & Ungson, 1991). Notwithstanding that human capital influences structural capital, yet structural capital exists independently of human capital (Chen, Zhu & Xie, 2004). Therefore, Structural capital can be defined as organization processes, practices, norm, and cultures that are codified and known with. Sveiby (1997) IC disclosure framework, structural capital attributes are: patents, trademarks, management philosophy, management processes, corporate culture, information systems, networking system and financial relation. Hence, this structural capital is one of the IC components used in this study to assess its value creation potentiality.

2.3.3 Relational Capital (RC)

The third dimension of IC is referred to as Relational Capital which is also delineated as an intangible asset developed, maintained and nurtured by organization in other to sustain its external relationship that influence corporate performance (Eugstrom, Westnes & Westnes, 2003). Ahangar (2011) further explains relational capital as the relationship with customers, shareholders, suppliers, and strategic partners that organization has built over the years. In addition, O'Regan, O'Donnel and Herman

(2001), view relational capital as the external constituencies and structures such as links to customers, suppliers, networks and other stakeholders that belong to an organization.

Thus, it is the strength and networking of organization through its customers and external factors (Bontis, 1996; Bontis & Fitz-enz 2002; Kavida and Sivakoumar, 2009; Stewart, 1997; Sveiby, 1997). Sveiby (1997) IC disclosure framework, relational capital has the following attributes: Brands, customers, customers' loyalty, company's name, distributing channels, business collaborations, licensing agreement, favourable contracts and franchising agreement. Relational capital is sometimes called Customer capital. This aspect of capital delineates market orientation of the organization (Nazari, 2010), based on the current and future demand of customers. Relational capital can therefore be said to be the external influences that an organization has built for sustainability. The three dimensions of intellectual capital and its relationship is illustrated in figure 2.1, has viewed by Hubert Saint-Onge, Stewart and Sullivan between 1985 and 1990 (Sullivan, 1998).

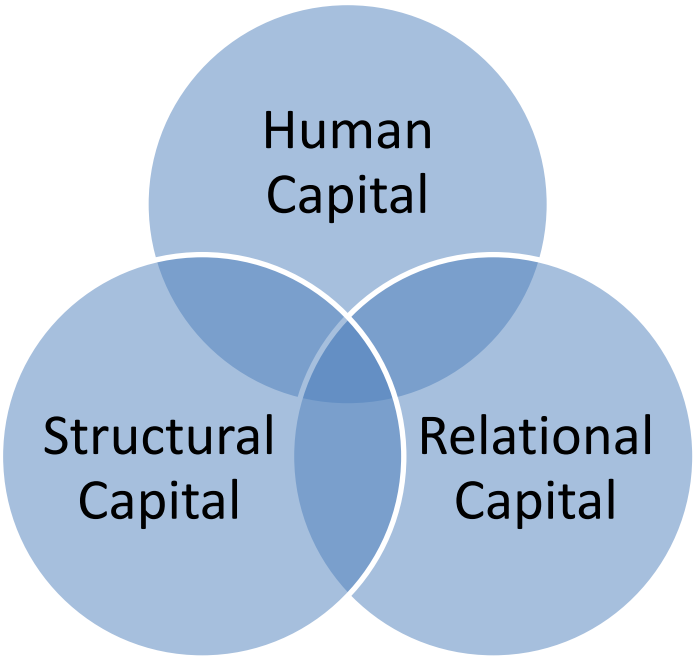

Figure 2.1
Relationship of the three dimensions of intellectual capital Source: Sullivan, 1998

The three dimensions of intellectual capital are believed by researchers to be interconnected to add value to organization; that is to be efficient. These three dimensions of intellectual capital are viewed and examined by their indicators/drivers by some researchers. It is important to note that, to examine IC efficiency of a company, investment of a company on individual IC drivers are always used, in order to assess the benefits/returns of such investment to the company. On the other hand, to examine IC disclosure of a company, IC components items/attributes disclosed are always used, to investigate the IC disclosure/reporting practice of a company. The following are examples of intellectual capital (efficiency) drivers/indicators of value that have been examined by various researchers.

2.4 Intellectual Capital Drivers

Intellectual capital (IC) driver is an economic value indicator through which the utility intellectual capital brings to the company is been measured (Green, 2005; Sullivan, 2000). The value of intellectual capital is tightly coupled to the company's

ability to transform intellectual capital into financial returns (Edvinsson & Malone, 1997; Green & Ryan 2005). On the other hand, IC can only be measured by its components drivers because of its nature (intangible), therefore, in order to measure IC performance it has to be decomposed into its driver that brings value to the company or organization (Green & Ryan 2005).

There are many IC drivers examined by previous researchers to investigate IC components' performance. Intellectual capital performance of a company shows how efficiently use is its intellectual capital resources. That is, the ability of a company to create value and utilize its IC resources optimally. The creation of value in knowledge-based economy of a company depends on the effective use of IC (Durst, 2008). While by disclosure, it shows the extent of intellectual capital (items) information a company publicly reported (Rahim, Atan & Kamaluddin, 2011). The IC drivers that have been examined by prior researchers are discussed below.

2.4.1 Human Resource

Human Resource is a driver of human capital of intellectual capital component which has been proved and examined to create value. This resource is made up of the employee education, skill, experience, spirit of team work etc. This resource is considered as the back bone of company in creating value. Madhulika and Vivek, (2010) and Edvinsson and Malone, (1997) argue that educated, skilled and experience employees is critical to increasing productivity of organization (s) to handle organizational structural resources and fostering innovation. Therefore, there is the need for qualified and appropriate investments by company to upgrade the employee for effective and efficient use of organizational structural resources at all time. This will reduce the wastage in production resources; reduce the production cost, thus increases profit of the company. For company's sustainability it needs qualified, experience and resourceful employee in a workplace (Sveiby, 1997). Thus,

human resource is an asset and back bone of a company. Many researchers have investigated this driver. Notable among these researchers are (Al-Mamun, 2009; Flamholtz, 2005; Kouhy, Veddy, Yoshikawa & Innes, 2009; Okwy & Christopher 2010; Theeke & Mitchell, 2008; Yahaya, 2007).

Okwy and Christopher (2010), examine the relevance of human capital to stock investment decision in Nigeria. They found that Human resource has value relevant to stock investment decision by investors. Kouhy et al. (2009), examine human resource policies, management accounting and organisation performance using sample from Canada, Japan and UK. The investment in 'job for live' policy in relation to human resource and in the overall development of the employees is viewed as asset. From these research works, it can be concluded that most of these intellectual capital drivers can be seen as assets that should be capitalised and reported. Therefore, this study uses human resource as one of the human capital value indicator to measure IC components coefficient in relation to company performance.

2.4.2 Research and Development (R&D)

Research and development (R&D) is a driver of structural capital, a component of intellectual capital. It comprises the cost of materials, service cost, salary and wages, cost of asset constructed, or acquired specifically for R&D, amortisation of patent and licence related to R&D, (NASB, 2006, SAS 22 para 13). The annual R&D expenditure of a firm is presumed to be investment that adds to a firm's value (Johnson Martenson & Skoog, 2001) which has been examined. This area has been explored by many researchers. For example, (Aboody & Lev, 1998; Amir & Lev 1996; Fukui & Ushijima, 2007; Oswalf & Zarowin, 2007) have examined the concept of R&D as part of intellectual capital/assets. Specifically, Aboody and Lev (1998), examine 163 US software companies that capitalised software expenditure

between 1987 and 1995. Oswalf and Zarowin (2007) examine UK firms which capitalise R&D expenditure. In order to test this submission on the value creation efficiency of R&D, this study includes it as one of the structural capital value indicators in relation to company performance.

2.4.3 Information Technology

Information Technology (IT) is another notable infrastructure of structural capital value indicator of intellectual capital component asset of firms which has been measured to create value. Madhulika and Vivek (2010) submit that information represent a new raw material in this present knowledge economy; and the electronic infrastructure now represent the principal way of sharing data, information and knowledge.

Thus, IT is an innovation, management uses to capture broad application ideas and optimize profitability and value (Madhulika & Vivek 2010). Dewan and Min, (1997) argue that capital invested on IT to improve the company's way of carrying out business should be considered as asset. This indicator/driver has been investigated by some scholars. For example, (Anderson, Banker & Ravindran, 2006; Bharadwaj, Bharadwaj, & Konsynski, 1999; Dewan & Min, 1997) have written extensively on IT as intellectual capital driver. Thus, Dewan and Min (1997) investigate IT capacity and IT spending. They provide evidence of value relevance of IT capability and IT spending using ranking index proxy for IT capability. Bharadwaj et al. (1999), on its own investigates how IT is used, while using Tobin's q to measure firm value. This study includes IT as one of the structural capital value indicators to test its value creation potentiality in relation to company performance.

2.4.4 Patent

Patent has been found to be value relevant to the market value of equity of a company. Therefore, patenting is one of the structural capital indicators of value of a

company in knowledge-based economy. There are studies that linked patent to market value of equity of companies. Example, Hall, Jaffe and Trajtenberg (2005) in their study found patent to be value relevant more than R&D. They examine citation of patent and R&D of firms from 1963 to 1995; and found that one additional citation of patent is associated with 3% higher stock price.

Also, Hirschey, Richardson and Scholtz (1998) found patent value relevant to earnings and book value of shareholders equity. Germane to the above submission is the work of Henkel and Reitzig (2007) which found patent to be a useful strategy in competitive in higher technological firms. Therefore, patent was used in this study as intellectual property to measure structural capital efficiency as indicators of value based on the submission of (Wyatt, 2008).

This study used patent as intellectual property following the submission of Wyatt, (2008) on intellectual property. He argues that structural capital includes patents, copyright, trademarks, designs, circuit layouts (intellectual property); IT and R&D (process capital) in knowledge-based economy. He argues further that most of these intellectual property items are output metrics of organizational process capital. Patent is output metric which is used to measure invention (R&D) (Lanjouw, Pakes, & Putnam (1998). As such patent is an outcome of R&D in a company. Therefore, following the submissions of Wyatt, (2008) and Lanjouw et al. (1998) to examine structural capital efficiency, this study includes “patent” since it is an output of R&D; as R&D is one of value indicators to measure structural capital efficiency in this study.

2.4.5 Advertising

This is another key indicator of relational capital of intellectual capital component that helps the continuality of a company. Investment in advertising creates value and should be considered as asset of a company. The cost of promotion, advertisement

incurred by company to increase its' sales and networking, and distribution channel are asset (Gu & Li, 2010). If there is appropriate advertisement and promotion, there is likely to be an increase in the awareness of the product or service the company is producing or rendering; leading to increase sales; thus lead to higher profits.

Notable among scholars that have examined advertising as driver of relational capital of intellectual capital component efficiency are (Gu & Li 2010; Joshi & Hanssens 2010; Shah, Zulfigar & Akbar, 2008). From this direction, Gu and Li (2010) examine advertising expenditure of pharmaceutical firms and non-pharmaceutical firms in relation to their stock price and returns. The result of their work indicates that pharmaceutical advertising expenditure should be treated as intellectual capital/ assets to be capitalised. On the other hand Joshi and Hanssens (2010) investigate the impact of advertising spending and market capitalisation. In the same token, Black, Jang and Kim (2006) consider advertising and R&D in relation to market value. Nixon (1997) found R&D expenditure to be key factor that determines the value the capital markets attribute to a company's performance. Therefore, advertising is used as one of the structural capital value indicators in this study.

2.4.6 Brand

Brand name is an output from series of prior investments in advertising and expenditure connected with product development. Therefore, it generates value through market power and signalling of product (Wyatt, 2008). At such, brand is an indicator of relational capital of intellectual capital component that helps a company to have a market share in a particular domain. Guo, Lev and Zhau, (2004) argue that high-tech companies lack of profitability has its root from their huge investments in marketing brand especially manufacturing companies.

Also, Kallapur and Kwan (2004) found brand to be value-relevant in UK firms. They opined that UK firms brand assets is as large as up to 44% of the book value of

shareholders equity. In addition, Seethamraju (2000) examines the internally generated US brand names and found that it highly valued externally using publicly available data of such companies.

2.4.7 Trademark

According to Wyatt (2008) trademark is intermediate output measure that is potentially valuable when company use it to signal desirable product attributes to consumers, thereby reduce information asymmetry between seller and buyer (Landes & Posner, 1987). Trademark creates value by motivating the company to invest in quality products (Mendonca, Pereira & Godinho, 2004) and engaged in innovative activities, leading to building of brand value (Schmalensee, 1978). In support of trademark in creating value, Greenhalgh and Rogers (2006) provide evidence that trademark is incrementally value relevant to R&D and patents in their study of UK companies between the periods 1989 - 2002. The study found trademarking companies experiencing 10-30% higher productivity compared with non-trademarking companies. Consequently, trademarking activities and its intensity is associated with huge differences in the market value of shareholders' equity (Wyatt, 2008).

2.4.8 Networking

Company-specific information benefits arising from networked system have been linked to stock price. For example Aral, Bronjolifsson and Van Alstyne (2008) provide evidence that the network metric is associated with stock price performance of a company because the network provides access to novel information. Using networking as output metric comprising of ten-month panel of email communication patterns, message content, and performance data from a medium sized executive recruiting company, they found positive evidence in support of networking as output metric. In addition, Rajgapal, Venkatachalam and Kotha (2003) found competitive

advantage output metric relating to networked system from website traffic is incrementally value relevant over earnings and book value of shareholders equity.

It is important to note that, those IC drivers discussed above are the IC drivers examined in the previous studies of IC efficiency and company performance, while others like management philosophy, corporate culture, and management process drivers of IC were used under IC disclosure. Therefore, these items were examined under IC disclosure in this study.

The reason for this study to examine Intellectual capital components 'drivers is that, most of the prior studies argue that they are value-relevant in knowledge-based economy. In addition, they are tightly connected with business enterprise's effort to transform them into financial returns and benefit (Edvinsson & Malone, 1997). In addition, they are indicators of IC efficiency. But, not all IC drivers have been examined by prior researchers, and also the results of these researchers are inconclusive, thus, there is a need to re-examine by incorporating new IC drivers to assess their efficiency on company performance as claimed by prior researchers especially in a new accounting environment-Nigeria.

Although, positive linkage between the intellectual capital components/drivers and company performance may not be easy to arrive at because of its nature (Bontis 1999; Green, 2008). However, if decomposed and given appropriate names and align them with operational data that actualizes them, they can be evaluated with company performance (Green, 2008). There are different ways of evaluating firms' performance; one of them is accounting-based measure. Accounting-based measure has been used by (Anderson, Banker & Ravindran, 2006; Bharadwaj et al, 1999; Dewan & Min 1997); in their various studies to measure financial performance likewise market performance.

Some research works have linked intellectual capital efficiency to company performance through the use of various drivers and financial accounting measures. Such drivers include, R&D, IT, Advertising, Brand, Patent, Innovation and Human Resource (IC drivers), ROA, ASR, Dividend, stock rice, operating income, ROI and Tobin's Q, Cash flow, Sale growth, Market value-Book value to mention but just a few. The next segment is review of prior studies on IC efficiency and company performance. The review begins with intellectual capital value creation studies in developed countries.

In this review, general views on intellectual capital performance are outlined. Inferences are then drawn on the implications of the submissions of various scholars and researchers on intellectual capital efficiency (performance) and company performance.

2.5 Intellectual Capital Efficiency and Company Performance in Developed Countries

It is worth pointing out that the intellectual capital efficiency has been measured against several company performance measures. Though, several empirical works on intellectual capital efficiency and company performance have been done in this context. Yet the findings provided so far are not generally similar. Part of the literatures indicates positive relationship between intellectual capital efficiencies and company performance, while others provide evidence to the contrary.

There are scholars that believe in the efficiency use of resources based, they compute the efficiency use of intellectual capital using the Pulic (2004, 2000) value added intellectual coefficient (VAIC) model to find IC efficiency potentiality in influencing company performance. For example, Chen et al. (2005) conduct an empirical study on Taiwanese listed companies. Their study used VAIC model to extract the intellectual capital components' efficiency and then analysed the relationship

between intellectual capital efficiencies and company performance measures (firms' market-to-book value).

The correlated analyses revealed that market-to-book value is positively related with VAIC components, indicating that firms' market value is positively associated with company intellectual capital efficiency. In addition, the market-to-book value and structural capital value added efficiency were not significantly related. However, market-to-book value is significant positively related with R&D expenditure, supporting the literature that R&D expenditure may capture additional indicator on firms' innovative capital. Impliedly, the study provides evidence that investors place higher value on firms with greater intellectual capital and that all the three indictors of value added in VAIC model are recognized as such.

In another dimension, Ghosh and Wu (2007) provide evidence in support of other user of accounting information order than the investors by examining the financial analysts in their study. Financial analysts do rely on intellectual capital to measure market valuation of firms and to forecast the likely future earnings of company. The study makes use of experimental research in which one hundred and sixty-seven (167) financial analysts and four companies completed the research materials. Out of these figure, 88 made short-term investment decisions and 79 made long-term investment decisions.

The result of the study provides that in response to the question about the importance of the four variables provided to the analysts in making the investments decisions, overall, the traditional measures of return on investment (ROI) and earnings growth were rated more important that IC. It worth noting that when these ratings for short-term and long-term investments decisions were compared, the importance of IC measures increases more than return on investment (ROI) and earnings growth. In

addition, the result further reveals that there is no significant difference among these attributes across the four companies.

Maditinos et al. (2011) use two stages to examine the relationship between intellectual capital and company performance. The first stage, the study computes the value added efficiency of the two indicators of efficiencies in value added intellectual coefficient (VAIC) model, then analysed the result of these efficiencies indictors with multiple regression analyses. They explored four different sectors of Greek companies listed in Athens Stock Exchange over a period of three years. The result of the study reveals that only human capital efficiency was statistically significant with return on equity. The two others value added efficiencies (structural capital efficiency (SCE) and capital employed efficiency (CEE) in the model were not significant.

Further, the finding provides evidence that all the four sectors results are similar throughout the three years of investigation, even though each sector was separately analysed. Thus, they conclude that investors place value more on human capital efficiency of the sample companies than other IC indicator when estimating the real value of such companies. Therefore, the results indicate that investors place different value on each of the three components of VAIC, since, human capital efficiency (HCE) is held more important than the other two components (structural capital efficiency and capital employed efficiency).

Germane to the above study is the work of Chang and Hsieh (2011). Chang and Hsieh (2011) examine 367 Taiwan semiconductor companies using Pearson correlation and linear regression after calculating the efficiency use of intellectual capital components and capital employed with VAIC model. The result provides that a company's intellectual capital efficiency has a negative impact on its financial and

market performance. However, the relationship between innovative capital (R&D) and companies' operating, financial and market performance is established and significant. The study's finding provides evidence that industrial capability of Taiwan's high-tech companies are supported by comprehensive infrastructural development.

Shiu (2006) uses the Pulic (2000) VAIC model to measure IC efficiency on company performance. Based on one year annual reports of 80 Taiwan listed technologies companies; the results show a positive correlation between intellectual capital efficiency and company performance. Human capital efficiency and capital employed efficiency have positive effect on profitability and market value, while structural capital efficiency has an inverse effect. The result reveals further that size of a firm has a negative significance over return on equity; likewise VAIC and leverage have an inverse relationship.

In addition, Cheng, Lin, Hsiao and Lin (2010) examine the effect of intellectual capital efficiency on company performance of health care industry in US. The study identified four components of intellectual capital as human, customer, innovative and process capitals, the structural path modelling was applied on financial data to analyse value creation relationships among four components of intellectual capital, as well as the causal effects of these four IC components. The study used the structural equation modelling to test the direct and indirect relationships among IC components and company performance.

Two steps approaches were adopted by Cheng et al. (2010). The study starts with confirmatory factor analysis (CFA) and then the causal-effect among the latent constructs by using LISREL package. The results of the study show that innovative capacity has a significant impact on maintaining customer relation. Further, the

result provides evidence that human value added has a positive relationship with customer relation and customer relationships have little impact on corporate performance. The overall findings of the study reveal that the human value added efficiency was statistically significant with company performance. Impliedly, the study suggest that human value added resources can lead to a significant positive enhancement of customers' relationship.

Another study on IC is the work of Engstrom, Westnes and Westnes (2003) which examine 13 hotels in the Radisson SAS Hotels and Resorts hotel in Norway. They used ICAP model after survey research design. ICAP model is an entirely different approach which evaluates intellectual capital resources. This approach is not self–application, but a tailor-made that varies from company to company. This model is based on each company's value chain and an analysis of the intellectual capital resources needed to generate income. The findings reveal that there is a strong relationship among the three intellectual capital component indicators. However, there is a stronger relationship between human capital and structural capital than the relationship between human capital and customer capital and the one between customer capital and structural capital. Also, there is a weak relationship between structural capital and gross operating profit.

In a similar study, Bontis and Fitz-enz (2002) investigate the direction of causality among the antecedents and consequents of effective human capital management with a mixed method. The study used a sample of 75 senior executives from 25 firms in the financial service industry in US. Questionnaires were designed for the qualitative part, while structural equation modelling was used for the quantitative aspect. The result provides three areas of most concern to the respondents. (1) Management leadership (value alignment) has the highest *r* in the correlation metric with 0.771,

followed by retention of key people (employee commitment) with 0.72; then business performance (employee motivation) with 0.566.

Further, the study provides that intellectual capital management yields human capital efficiency through return on investment; the effective management of intellectual capital assets is likely to yield higher financial returns from employees and business performance. Also business performance is positively influenced by the commitment of its organizational members and their capacity to generate new knowledge.

In a single business unit, Youndt et al. (2004) investigate the impact of human resource management, information technology and R&D on market performance; using Tobin's q as measure of market performance with sample of 208 companies with more than 100 employees. The study reveals that human resource management and information technology are more important than R&D across the organization. It was further revealed that few organizations developed high level of all the three components of IC.

In summary, there are inconsistencies in the results of most of these studies reviewed. In addition, some of the studies reviewed conclude that industry differences, size of firm have influence on the investments of intellectual capital which in turn reflect on the performance of intellectual capital (Calisir et al. 2011; Maditinos et al. 2011; Shiu, 2006). Conclusively, there is not clear direction to the relationship between IC efficiency and company performance from reviewed literature on the previous studies; thus the relationship between IC efficiency and company performance findings are inconclusive.

Therefore there is a need to re-examine IC efficiency and company performance in a new accounting regulatory environment like Nigeria, as most studies argue that on IC efficiency depends on both the amount of investment on such resource (IC),

accounting regulatory and the nature of a company (Al-Twaijry, 2009; Shukor, Ibrahim & Nor, 2009). Table 2.1 presents summary of intellectual capital efficiency studies in developed countries.

Table 2.1
Summary of Studies on Intellectual Capital Efficiency and Company Performance in Developed Countries

Authors and Year	**Sample**	**Method of Research**	**Independent Variable**	**Dependent Variable**	**Main Result**
Chang and Hsieh (2011)	All listed Semiconductor companies on Taiwan Stock Exchange	PLS and Correlation	IC and R&D expenditure.	Financial and market performance	Company's Intellectual capital has negative impact on its financial and market performance. Significant relationship exists among R&D expenditure and financial and market performance.
Youndt et al. (2004)	208 Public listed companies in New York	MANOVA analysis	Human capital, Social capital and organisation capital.	Financial return and Tobins'q	HRM and IT investments are more important than R&D investments.
Chan et al. (2006)	All listed companies in Hang Seng index Hong Kong stock exchange for 2001-2004	Regression	Intellectual capital coefficient.	Business profitability	IC is positively associated with business profitability.

Table 2.1 (Continued)

Authors and Year	Sample	Method of Research	Independent Variable	Dependent Variable	Main Result
Beattie and smith (2010)	UK listed companies.	Pearson correlation and regression	HC	HC performance	All the four variables used to measure human capital performance are value relevant.
Andreou and Bontis, (2007)	84 high-tech federal `contractors in the Washington DC metro area	Partial least squares	IC components	Financial performance	There inter-relationship between the IC components. Also IC is related to company performance
Kujansivu and Lonnqvist (2007)	Listed companies in Finland between 2001-2003	Regression	IC	Financial performance	The relationship between the value and efficiency of IC remains unclear.
Subramaniam and Youndt (2005)	93 public listed companies in New-York	Regression	IC and innovative capability	ROE and ROA	IC components are interrelated and influenced innovative capabilities and ROE, ROA.

Table 2.1 (Continued)

Authors and Year	Sample	Method of Research	Independent Variable	Dependent Variable	Main Result
Wang and Chang (2005)	All listed firms in the IT industry in Taiwan between 1997-2001	PLS	IC	Business performance	Intellectual capital influences business performance with exception of human capital.
Al-Twaijry (2009)	384 listed manufacturing Japanese companies founded before 2001	Regression	R&D expenditure	Corporate growth	R&D investment contributed 15% variation in the sample companies' future growth.
Cheng et al. (2010)	Listed US Healthcare industry and pharmaceutical firms.	SEM	IC	Company performance	Significant relationship exists between intellectual capital and company performance.
Chen et al. (2005)	Taiwanese listed companies.	Regression	IC	Financial performance	Firm's intellectual capital has positive relationship with value and financial performance.

Table 2.1 (Continued)

Authors and Year	Sample	Method of Research	Independent Variable	Dependent Variable	Main Result
Maditinos et al. (2011)	96 Greece listed in the Athens Stock Exchange between 2006 to 2008	Regression	IC	Financial performance	There is significant relationship between human capital efficiency and financial performance. IC is a strategic asset for firm's competitive advantage.
Engstrom et al. (2003).	13 hotels in Norway	Regression	IC	Operating profit	HC and RC have strong relationship with operating profit, while SC has weak relationship with operating profit.

In summary, there are inconsistencies in the above reviewed studies, some find positive relationship between IC components indicators and company performance, while some find negative relationship and other find unclear relationship. Furthermore, most of these studies used one IC driver to represent structural capital in valuing structural capital efficiency (e.g. R&D, and IT). Therefore, this study re-investigates the IC components by combined three structural capital value indicators (R&D, IT and Patent) in order to examine the relationship between IC efficiency and company performance in a different accounting environment (Nigeria).

However, the nexus in the developing countries may somehow different as indicated by some of the literature reviewed from developed countries. Therefore, in the next section of this chapter, the study concentrated on the relationship between intellectual capital and company performance in developing countries.

2.6 Intellectual Capital Efficiency and Company Performance in Developing Countries

In developing countries intellectual capital as source of operational resources are more recent than developed countries (Firer & Williams, 2003). Similarly, accounting framework for voluntary reporting of intellectual capital is relatively recent than in the developed countries (Firer & Williams, 2005, 2003). Therefore, works on intellectual capital efficiency and company performance are relatively smaller in the developing countries. Hence, inference from developed countries studies to the developing countries may not be adequate. Therefore, this study reviews some of the literature pertinent to intellectual capital efficiency and company performance in developing countries.

For instance, Firer and Williams (2003), in a study of 75 technological public listed companies in South Africa for only one (1) year analysis assume intellectual capital influence corporate performance. Data for the study were gathered from the annual reports of these companies. They utilize intellectual capital value added as indicators of intellectual capital efficiency and profitability, productivity and market value as measure of corporate performance with size, leverage as control variables. The methodology employed includes Pearson correlation and linear regression model. The Pearson correlation result shows there is a negative correlation between capital employed efficiency and productivity, but a significant positive association with market value. However, human capital efficiency is significantly associated with productivity. None of the three intellectual capital value added indictors is correlated

with profitability. The result of regression analysis reveals that none of the intellectual capital value added indicators are statistically related with corporate performance, even after controlling the effect of the profitability, productivity and market value.

However, Tan, Plowman and Hancock (2007) overcome the problem of one unit industry used by Firer and Williams (2003). The study covers more than one sector of public listed companies on the Singapore Exchange between 2000 and 2002. The study examines the value creation efficiency of intellectual capital and at the same time investigates the relationship between value added indicators of intellectual capital efficiency and capital employed and financial returns (return on equity, earnings per share and annual stock returns) of the sample companies.

The study generates data from single source – annual reports. Tan et al. (2007) regresses intellectual capital efficiencies and capital employed efficiency indicators with Partial Least Square (PLS). They argue that return on equity, annual stock returns and earnings per share are different for companies with greater intellectual capital investment as compared to those with lower intellectual capital investment. However, a significant relationship exist among intellectual capital value added indicators, capital employed and company performance measures for the three companies observed.

Complementing the work of Tan et al. (2007) study of intellectual capital impact on stock returns, Appuhami (2007) studies the impact of intellectual capital on investors' capital gains on shares of financial institution in Thailand, to find out the influence of IC on earnings per share of the sample companies. He investigates the effect of the value creation efficiency of intellectual capital on capital gain by investors, using value added intellectual capital coefficient (VAIC) and regression

analysis. The results from the study provide that human capital efficiency and structural capital efficiency have significant positive relationship with capital gain on shares. However, capital employed efficiency has an inverse relationship with capital gain on shares.

In a time series approach, Makki, Lodhi and Rohra (2009) evidence that capital employed efficiency together with intellectual capital efficiencies have impact on shareholders earning. They used data from 25 public listed companies from Lahore Stock Exchange for seven years analysis. Makki et al. (2009) include size of company, salaries of top level executives, frequency of the board of directors' meetings and number of executives in a company as moderating variables in the regression model. The result of the study shows human capital efficiency and capital employed efficiency are positively correlated with earnings per share while structural capital efficiency is negatively correlated with size in all the seven years except in the year 2004. Further still, the regression result shows that intellectual capital efficiencies are related with earnings performance of sampled companies in Pakistan.

In the study of Kamukama, Ahiauzu and Ntayi (2010) which used ModGraph program (Excel version) along with Kenny and Boran approach to test the interaction effect of intellectual capital components and their influence on financial performance of microfinance institution in Uganda. Sixty-five (65) microfinance companies were used as sample size in this survey study. Human capital was measured using Intangible Asset Monitor developed by Sveiby (2001).

Questions were developed from these aspects: employee know-how, education, vocational qualifications, work- related knowledge, work related competence, entrepreneurial spirit, and innovations. Organizational culture, orientation to quality, innovation, continuous improvement, information system and teamwork are area

where questions were developed for structural capital; while relational capital was measured using a combination of instruments. The finding indicates that human capital, structural capital and relational capital are significantly related to financial performance with R^2 38%. In order to test for the interactive term, there was an increase in R^2 from 38% to 44%. Questions were not drawn on training and development costs of employee, trade-mark and trade secret of the company.

Ahangar (2011) work is another study from developing countries. This study provides information on the role of intellectual capital efficiency on company performance. He applies VAIC model to calculate the value added of the intellectual capital indictors and capital employed indicator. The value added indictors were later analyzed with regression analysis to examine the relationship that exists between intellectual capital efficiency and financial performance of the sampled companies. The result provides evidence that throughout the years of analysis only human capital is statistically related to company's profitability.

The other two indicators of value added efficiency (structural capital and capital employed) are not significantly related to profitability. However, human capital efficiency and capital employed efficiency and Assets Turnover Ratio significantly influence growth in sales. In addition, human capital efficiency is significantly related to productivity, while, capital employed efficiency is negatively related to productivity.

Narrowing down the scope, Alipour (2012) examines relationship between intellectual capital efficiency and firm performance of 39 insurance companies in Iran covering three years (2005 to 2007) observation. He applies multiple regression models (partial least square) with size, leverage and return on equity as control variables. The findings show that there is significant positive relationship between

human capital, structural capital and capital employed efficiencies with profitability. However, there is an inverse relationship among size, leverage and profitability.

Ting and Lean (2009) assess the relationship between intellectual capital efficiency and financial performance of 20 financial institutions in Malaysia for the period of 1999 to 2007. Pulic model value added intellectual coefficient (VAIC) was applied on the intellectual capital components to calculate its value added potentiality. Spearman correlation and linear regression analysis were employed to examine the direction of the relationship of the variables in the study. The results of the correlation and regression reveal that human capital efficiency, and capital employed efficiency were significant and positively correlated to return on asset. While structural capital has inverse relationship with return on asset. Beyond the analysis of individual sector (s) in a specific country is the work of Abdulai, Kwon and Moon (2012) which examine IC efficiency and company performance in West African countries.

Abdulai et al. (2012) assess the relationship between intellectual capital efficiency and company performance of three African countries (Ghana, Nigeria and Senegal). The study basically investigates the intellectual capital components competitive capabilities of 83 software companies across the three countries. Theoretically, the study draws concept from multiple theoretical perspectives to develop a model for assessing the relationship between intellectual capital efficiency of software companies and their performance. A survey method was used to gather the necessary information needed to carry out the research. Data were analyzed with partial least square method. The results show that there is significant relationship among intellectual capital components, competitive capabilities and companies' performance.

In summary, from the reviewed literature on the intellectual capital value creation efficiency, it is evident that there is a positive role intellectual capital played on the company's performance and its sustainability. However empirical studies are smaller compared with the developed countries, in term of unit of analysis and diversity of the coverage. Table 2.2 presents summaries of intellectual capital efficiency and company performance studies in developing countries.

Table 2.2
Summary of Studies on Intellectual Capital and Company Performance in Developing Countries

Authors	**Sample**	**Method**	**Dependent Variable.**	**Independent Variable**	**Result**
Alipour (2012)	39 Insurance in Iran	PLS	Profitability	IC components	IC components are related to profitability
Abdulai et al. (2012)	83 Telecommunication companies in three West African Countries (Ghana, Nigeria and Senegal	Structural Equation Model (SEM)	Profit growth, future growth, & industry leadership	IC	Intellectual capital components are significantly correlated with business performance
Ahangar (2011)	Listed Iran companies	Regression	Financial performance	IC	IC performance explains profitability and productivity of the sample companies.

Table 2.2 (Continued)

Authors	Sample	Method	Dependent Variable.	Independent Variable	Result
Salamudin et al. (2010)	Listed companies in Bursa Stock Exchange in Malaysia.	Regression	Market value	Intangible asset	Malaysian corporate valuation is slowly employing intangible assets.
Shukor et al. (2009)	Firms listed Malaysia	Regression	Market price	Price Model, Correlation & regression	Intangible assets are negatively associated with Market price.
Makki et al.(2009)	Listed companies Pakistan	Pearson correlation and regression	Shareholder Earnings	IC	VAIC contributes significantly to Earnings per share of the sample companies.
Makki Lodhi (2009)	25 listed companies in Lohare Stock Exchange in Pakistan	Regression	ROI	Correlation and regression	VAIC contributes significantly to ROI of the sample companies.
Ting and Lean (2009)	20 Financial Institution in Malaysia	Pearson correlation and regression	ROA and ROA	IC	VAIC and ROA are positively related among Malaysia's finance sector

Table 2.2 (Continued)

	Sample	Method	Dependent Variable.	Independent Variable	Result
Kamukama et al. (2010)	65 Microfinance Companies in Uganda	ModGraph and Regression Analysis	Net profit Ratio, Repayment Rate, & ROA	IC	Human capital performance depends on Structural capital and no significant interaction between structural capital and Relational capital.
Appuhami (2007)	Banks in Thailand	Regression	Capital gain on shares	IC	IC has a significant positive relationship with investors' capital gain on share
Firer and Williams (2003)	Public listed companies in South Africa	Pearson correlation and regression	Financial performance	IC	IC not related to financial performance of sample companies.

Conclusively, there are few studies examining the relationship between IC efficiency and companies' performance in developing countries compared with developed countries. But they are similar in their findings which is inconsistencies. Thus, need further re-investigation of the relationship between IC efficiency (performance) and company performance by increasing the scope. The next important question to ask is whether Nigerian companies efficiently used their IC resources and whether these intellectual capital efficiencies play significant and positive role on the performance of the companies.

2.7 Intellectual Capital Efficiency and Company Performance in Nigeria

In this part, the study tries to answer the question raised in the previous part, by reviewing the scanty IC literature available on Nigeria. Yahaya (2007) conducts a study on impact of investment in human resource (training and development) on employees' effectiveness in Nigerian banks. It is the first study to our knowledge to examine one component driver of intellectual capital (human capital) in Nigeria, but neither the study examine the relationship between intellectual capital efficiency (performance) on company performance nor examine the intellectual capital disclosure on company performance but rather examine the impact of investment cost on employee and its effect on employees' effectiveness. The study employed the measure published by the Institute of Intellectual Capital Research to investigate human resource effectiveness in three banks. Data collected from annual reports and questionnaires were analyzed using descriptive inferential statistics.

The result of the study shows that Zenith Bank has the best human resource management practice. The result further identified the main training and development activities in the sampled banks as training on the job, skill improvement, training on newly acquired material, regular training and acquisition of on the job experience. The study did not use value creation statistical technique to analyze the efficiency of human capital and at the same time, the effect of trained employees is not measured on the banks' performance. Thus, the impact of the training on the employees could not be inferred on the banks' performance. Improving the work of Yahaya (2007), Okwy and Christopher (2010) examine the relevance of human capital accounting to stock investment decisions. The study employed survey research design with 65 sample size. This study improves Yahaya (2007) study by upgrading the statistical tool used in analyzing the data. Chi-square

statistical tool was employed to analyze the major factors in determining the value of a firm's stock price. The finding of the study provides that the quality of human capital is a major factor in determining the value of a firm's stock and investment decisions. This study employed primary data with 65 respondents based on only human capital out of three IC components.

Another study on intellectual capital efficiency and business performance is the work of Uadide & Uwuigbe (2011). They examine intellectual capital efficiency and business performance of 32 public listed companies in the year 2009. Content analysis was employed to extract the intellectual capital component from the annual reports, while Pearson correlation and regression analysis were used to examine the relationship between intellectual capital value added efficiencies and return on equity and return on assets. The Pearson correlation and regression analysis reveal that there is significant positive relationship between intellectual capital efficiency and business performance. Despite the recency of this study, it only covers 32 companies. The most recent and improved study is the study of Suraj and Bontis (2012) which examines the intellectual capital efficiency and business performance of telecommunication companies in Nigeria. The study used survey method with data collected from 320 managers of 29 telecommunication companies. Factor analysis was employed to verify the validity of the items in each construct. Regression analysis was used with partial least square to examine the relationship between intellectual capital constructs and business performance. Both the Pearson correlation and regression analysis results show that human capital, structural capital and customer capital correlated with each other and intellectual capital correlated with business performance. The study further reveals that, there is a significant relationship between intellectual capital and business performance. Table 2.3

presents summary of studies on intellectual capital efficiency and company in Nigeria.

Table 2.3
Summary of Studies on Intellectual Capital Efficiency and Company Performance in Nigeria

Author(s)	Sample	Dependent Variable	Independent Variable	Method	Result
Suraj and Bontis (2012)	29 Telecommunication companies	Industry leadership, future growth, profit growth	HC (competence, job rotation, recruitment programme) SC (Implement new idea, support develop to idea) & RC (customer related satisfaction, customer retention & market share.	PLS	Intellectual capital components correlated among each other, and related to business performance
Uadiade and Uwuigbe (2011)	32 Quoted companies	Return on Asset and Return on equity	HC (Salaries & wages), SC (VA-HC)	PLS	Intellectual capital efficiency is related to business performance
Okwy and Christopher, (2010)	65 respondents	Stock Price	Human capital (education qualification)	Ch-square	Quality of employee is a determinant factor a valuing company
Yahaya (2007)	3 banks	Return on Investment	Training and development	ANOVA	There is no standardized method of assessing human resource in Nigerian

banks.

Generally, from the literatures reviewed it is glaring that most researches or studies had examined the intellectual capital efficiency in creating value and its influence on companies' performance. However, these studies focused on the impact of individual intellectual capital indicator (e.g R&D, IT, Advertising, HR) on company performance but neglect the effect of connectivity some specific indicators of value added of intellectual capital (R&D, Patent, and advertising) in examining structural capital efficiency; (compensation, welfare package cost and salaries and wages) in examining human capital efficiency as suggested by Wyatt, (2008).

It's on this note that this study combined these IC value drivers (R&D, IT, patent and advertising) in examining structural capital efficiency, (HR- salaries and wages, compensation and welfare package) in examining human capital efficiency as stressed by Wyatt (2008); Skandia Value Scheme, (1998). More importantly, these IC drivers complement each other for example, patent is an output metric of R&D. Compensation and welfare package are considered as company investments arising from employees' benefits (IAS 38 & Skandia value Scheme, 1998).

The reason for ignoring compensation cost, welfare package and intellectual property (patent) by previous studies could be attributed to none availability of data used by previous studies. More importantly, the sample sizes of some of these studies revealed are small to generalize their results and some are industry specific. Specifically, the Nigerian studies reviewed examined one single sector; covers one or two periods and few IC components indicators. These IC components examined did not include the new IC components indicators introduced by this present study.

Nazari (2010); Makki et al (2009) and Skandia value Scheme (1998) suggest using new variables such as intellectual property (patent), compensation cost and welfare package to improve the intellectual capital components' efficiency (performance) as there is no yet standard measure (s) or consensus for intellectual capital efficiency (performance).

To improve on these studies, the present study examines intellectual capital efficiency in relation to company performance of 117 Nigerian companies. In addition, this present study incorporates compensation cost, welfare cost and intellectual property (patent) to expand Pulic (2004, 2000) VAIC model for evaluating the intellectual capital value creation efficiencies (performance). The next segment is intellectual capital disclosure.

2.8 Intellectual Capital Disclosure

In order to assess the true worth of a company by the users of accounting information, its IC resources should be publicly disclosed in the annual reports for better understanding of the likely future cash flow benefit from IC resources (Rahim et al. 2011). Disclosing of IC in the annual reports of companies can never be anything but a model (Ginoglou, et al. 2009). The basic problem now is how to reconsider the IC accounting process in a new perspective. Companies traditionally use double entry accounting as their basic operational model for the recording of day-to-day activities. This currently faces limitations due to the highly networked nature of the economy (globalization) in general, and the business to business transactions amongst trading parties, in particular. In addition, there is a long-felt need to reconsider the reporting regulations for IC as well as the related business decision making process to reflect the view of all the stakeholders (Ginoglou et al. 2009). Thus, disclosure of IC is necessary to amend this situation. Previous studies have proven that disclosure of intellectual capital information in the annual report of

companies' enhanced value and also assist investors and creditors in decision making respectively.

Disclosure of information in a company is necessary to ensure that operational resources are better utilized and understood, so that investors as well as the creditors would have confidence in such company and continue supporting such company (Zainon, Atan, Wah & Ahmad, 2012). By and large, disclosure of intellectual capital information is pertinent to users of accounting information for rational decision making (Okwy & Christopher, 2010). At such, disclosing of IC information by company can assist such company to publicly provide evidence about its true value and its wealth creation potentiality, which in turn may enhance company's performance (Rahim, Atan & Kamaluddin 2011). Due to the importance of IC as value creator, its disclosure is important in the financial statement of companies (Rahim et al. 2011).

According to International Federation of Accountants (IFAC) financial statement is an explanation of the significant items, transactions and events presented by an entity. Financial statement is a tool used by publicly listed companies to disclose their activities. Financial statement has an important role in reducing information asymmetry among companies and the stakeholder (Lopes & Alencar, 2008; Boesso & Kumar, 2007). Disclosure practices complement the role performed by accounting figures in producing a picture of company's economic position (Lopes & Alencar, 2008). The usual disclosure practice by companies is either mandatory or voluntary. The mandatory disclosure is required by laws, regulations, accounting standards, General Accepted Accounting principle (GAAP) and business norms while the voluntary disclosure in companies is different and is used to complement mandatory disclosure. Voluntary disclosure is normally used as a strategy by companies to

better inform their external users and to display their competitive advantage over their competitors (Abeysekera, 2007; Boesso & Kumar, 2007). Abeyesekera (2007) avers that the possible explanation for the above submission is that firms can reveal valuable information about their business activities through voluntary disclosure. Companies may complement mandatory regulations by providing information about their competitive advantage aspects which are not required by rules and norms (voluntary). The basic idea is that higher levels of disclosure reduce information asymmetry.

In Nigeria, there is no accounting standard on disclosure of internally developed intellectual capital (IC) drivers, except R&D. In the absence of accounting standard, companies disclose their IC is voluntary. Hence, companies have full discretion of its method on IC disclosure. Thus, companies in Nigeria are facing the same problem in term of publicly disclose their true value and wealth creation potentiality like their counterpart in both developed and developing countries.

2.8.1 Review of Intellectual Capital Disclosure Performance

Prior studies have shown that disclosure of intellectual capital contributes to reduction of information asymmetry from company to stakeholders; thus, increase transparency in the company activities reflecting the true value and the position of their companies (Niemark, 1995). Researchers have conducted studies to link intellectual capital information disclosure to reduction of information asymmetry and to promote and create the awareness of its value creation. Investors react and accurately incorporate any new information that has value relevance when making investment decision (Srinivasan & Hanseens, 2009). Such studies include; (Abdolmohammadi, 2005; Ghosh & Wu, 2007; Gu & Li 2010; Lopes & Alencar, 2008; Oswald, 2007; Oswalf & Zarowin, 2007; Verguwen et al, 2007).

For example, Abdolmohammadi (2005) investigates the intellectual capital disclosure practice of 58 USA companies for five years. Using content analysis the results show that better corporate disclosure can improve manager's production or investment decision if investors and firms coordinate with respect to capital allocation via public disclosures. Companies' disclosure of IC information provides useful benchmark that help outside investors to evaluate other firms' managerial efficiency and potential (Martins & Alves, 2010).

Along the same line, Oswalf and Zarowin (2007) realise that UK firms which capitalise and disclose R&D expenditure provide more useful information on intellectual capital drivers' performance for investors and other financial statement users for evaluation of firm financial performance. Consistent with this conjecture, is another research from Holland, (2009); Healy and Palepu, (2001); Lang and Lungholm, (1996). Healy and Palepu (2001) submit that companies' realized-stock-returns are high in the years following an improvement in their disclosure.

Their study further reveals financial reporting rules and disclosure regulation may stabilize financial market by limiting asset bubbles but disclosure differ from company to company, according to the nature of capital and its intensity and regulatory environment (Shukor, Ibrahim & Nor (2009). There are studies that examined IC disclosure according to IC categories, IC item frequency, firm size and type of firm; for example, Vergauwen et al. (2007); Abeysekera and Guthrie (2005), and Bozzolan, Favotto and Ricceri (2003).

Vergauwen et al. (2007) examine the relationship between Human capital, Structural capital, Relational capital and level of disclosure of firms from Denmark and Sweden and UK using content analysis. The results of the findings reveal that there is a strong significant positive relationship between structural capital drivers and the

firm's intellectual capital disclosure. The results further reveal that large companies disclose their intellectual capital than small companies.

In the study of Abeysekera and Guthrie (2005) which examine 30 top companies listed in Colombo Stock Exchange in Sri-Lanka revealed that the most reported IC category was external (relational) capital, followed by human capital. The study pointed out that brand was the most reported attribute in the external (relational) capital category. For human capital category, information related to employee was the most reported, while under internal (structural) capital category, processes were the most reported.

Bozzolan, Favotto and Ricceri (2003) assess voluntary intellectual disclosure of Italian companies and found out that external capital were the main focus on the IC disclosure of the sampled companies. They further reveal that size and industry type were determinant factors in explaining the differences in reporting practice among the companies.

In a nutshell, the above findings imply that market reaction to disclosure of intellectual capital information and book-to-market value is correlated. This means that disclosure of intellectual capital information is a good tool for a company to publicly convey its accounting information to communicate its hidden value (Holland, 2009). When firms disclose their intellectual capital information, it improves the quality of information in the financial reports and provides users a cleaner measure of IC drivers that can generate future benefit (Holland, 2009). Thus, by disclosing intellectual capital information managers provide information about the expenditures they believe will generate future benefit at the same time reduce information asymmetry.

Empirical studies have shown the importance of disclosing IC information in the financial statement of company. Firstly, sufficient information on IC determines the company's financial position and can be a source of important economic gain for individual investors or other stakeholders that base their decision on the financial information that company report periodically. Secondly, IC information showcases a company's value creation potentiality. Finally, it reduces information asymmetry that can arise from non-disclosure.

On the other hand; if IC information is not disclosed in the financial statement of company could lead to the following problems. Firstly, lack of adequate accounting information reflecting IC can result in the loss of business opportunity based on IC resources owned by the company but not identified or explored by managers; secondly, reduction capability to access resources and finally, lack of information on company IC will be a source of uncertainty over its future earnings which could translate to excessive volatility of stock price (MERITUM Project, 2002).

Since accounting information are estimate taken by market participants (investors, financial analysts, creditors) as basis for designing their investments strategies (Hamzah & Ismaila, 2008; MERITUM Project, 2002). Disclosure of reliable information on company investment on IC resources may be of help in overcoming the above problem. Disclosure of IC is also possible if company can reliable measure its IC, thus its disclosure will be easier. Hence, IC efficiency and IC disclosure complement each other, at such they are interwoven. Most of the studies on intellectual capital disclosure used content analysis.

In accordance with Guthrie and Petty (2000) submission, content analysis involves the coding of the IC information attributes or items in the annual reports of companies to identify IC practice of such companies. This method has been used by

many researchers such as Abeysekera and Guthrie (2005); Goh and Lim (2004); Bontis (2003); Brennan (2001). Empirical evidences have shown the importance of intellectual capital disclosure performance generally. Until recently, however, the majority of researchers have focused on specific component/driver of intellectual capital which makes it difficult to establish an overall performance of intellectual capital disclosure (Guthrie & Petty 2000). According to Guthrie and Petty (2000), relating IC performance to a particular aspect of intellectual capital disclosure may not capture the true relationship unless there is a measurement construct upon which the disclosure measurement will be based.

Studies have also shown that the dominant approach to evaluating the quality and quantity of a firm's intellectual capital disclosure today is the use of content analysis to capture a firm's intellectual capital disclosure practice (Al-Mamud, 2009; Li et al. 2006; Schneider, 2006; White et al. 2010; Yi & Davey, 2010). These arguments had inspired several researchers to use content analysis in examining IC disclosure. For example, Yi and Davey (2010) use content analysis with 16 items to examine the extent and quality of intellectual capital disclosure of 49 dual-listed companies in mainland of China. The intellectual capital disclosure of the sampled companies were grouped in to three main heading (Internal capital, external capital and human capital) in which 8 items are for internal capital and external capital each, while 6 items are under human capital.

Also, White et al. (2010) use content analysis with 78 items as intellectual capital disclosure in which 27 items relate to employee, 14 items for customer, 15 items for process, 8 items for R&D while the remaining 15 items for strategy statement. The findings of the study from the regression analysis show that the extent of ICD disclosures has a significant relationship with country and size.

In addition is the work of Schneider (2006) support the use of content analysis to capture intellectual capital components/drivers disclosed. Their study was carried out on annual reports of 82 local government authorities in Zealand between 2004 and 2005. The study has 26 items as intellectual capital disclosure captured and measure the disclosure level of the three dimensions of intellectual capital using content analysis with 0-5 scales. Also, Guthrie, Petty, Ferrier, and Wells (1999) expand Sveiby (1997) IC disclosure framework to examining 20 Australia companies using content analysis. Table 2.4 presents summary of studies on IC disclosure using content analysis.

Table 2.4
Summary of Studies on Intellectual Capital Disclosure

Author(s)	**Country**	**Objective**	**Sample size**	**Methods**	**IC items**	**Scoring scale**
Guthrie et al. (1999)	Australia	To examine the level of ICD	20 companies	Content analysis	24	0-3
Brennan (2001)	Ireland	To examine the level of ICD	11 companies	Content Analysis	24	0-1
Bontis (2003)	Canada	To examine IC Disclosure	11,000 firms	Content analysis	39	0-1
Bozzolan et al. (2003)	Italy	To examine the IC Disclosure	30 non-financial listed companies	Content analysis	22	0-2
Vergauwen and Alem, (2005)	Netherlands, France and Germany	To examine and compare the level of IC	89 listed companies	Content analysis	22	0-2
Wong and Gardner (2005)	New Zealand	To examine the Extent of IC	60 listed companies	Content analysis	38	N/A

Oliveras et al. (2008)	Spain	Disclosure To investigate the level of IC Disclosure	12 Spanish listed companies	Content analysis	39	N/A

Table 2.4 (Continued)

Author(s)	**Country**	**Objective**	**Sample size**	**Methods**	**IC items**	**Scoring Scale**
Oliveira et al. (2006)	Portugal	To identify factors Influencing IC Disclosure	56 listed companies	Content analysis	32	0-2
Abeysekera and Guthrie (2005)	Sri Lanka	To examine the Patterns of IC Of large listed Firms	Top 30 listed firms	Content analysis	17	N/A
Kamath (2007)	India	To study the Extent of IC Disclosure in Emerging Industries	30 knowledge-intensive companies	Content analysis		
Schneider and Samkin (2008)	New Zealand	To examine the extent of IC Disclosure by Government	82 local authorities	Content analysis and disclosure Index	26	0-5
Whiting and Miller (2008)	New Zealand	To examine the extent and type Of IC disclosure	70 publicly listed companies	Content analysis	18	0-2
Shareef and Davey (2006)	UK	To examine the extent of IC Disclosure by Football clubs	19 English professional football clubs	Content analysis	52	0-5
Yi and Davey (2010)	China	To examine the extent and Quality	49 dual-listed companies	Content analysis and	16	0-5

	of IC Disclosure	in mainland	disclosure index

In summary, the above studies reviewed are used as a general guide in using content analysis in this study. But this study adopted the IC disclosure framework developed by Sveiby (1997), replicated and expanded by Guthrie, Petty, Ferrier and Wells (1999) and Guthrie and Petty (2000). This study adopted this IC framework because; firstly, this framework was based on voluntary IC disclosure of which this study is based on. Secondly, the framework has been established and tested in a country similar to Nigeria-Malaysia. Rahim et al. (2011) examine intellectual capital reporting of technology industry in Malaysia with this IC framework. Malaysia and Nigeria are two different countries of similar characteristic being developing countries. Next is intellectual capital reporting and accounting regulatory.

The present financial reporting standards do not give room for reporting internally generated IC except R&D, thus there is always a conflict between managers using their discretion on voluntary reporting and accounting regulation and standards (Wyatt, 2008). The next segment presents international accounting standards on intellectual capital reporting.

2.9 International Intellectual Capital Reporting and Accounting Regulatory

With the globalization of international financial markets, the idea to adopt a common language for financial reporting to develop international comparability is imperative. Therefore, there is the need to have accounting regulatory to oversee all accounting affairs (such as standardizing and regulating of accounting definitions, assumptions, principle, practice and methods). The relevant Accounting Standards are reviewed starting from International Accounting Standard (IAS) 38.

2.9.1 International Accounting Standard (IAS) 38

IAS 38 was prepared by International Accounting Standard Board on 1st January, 1979 to account for "Research and Development Activities", revised in 1993 as accounting for "Research and Development Cost". On September, 1998 revised as "Intangible Asset"; revised again in March, 2004 as applied to "Intangible Asset Acquired" in business combination. On 22nd May, 2008, IAS 38 was amended to International Financial Reporting Standard (IFRS), which accommodates advertising and promotional activities to be amortized. This revision continues. Recently, IFRS revised IAS 38 on 1st January, 2012, but not yet approve by International Accounting Standard Board (IASB). This standard deals with accounting treatment for intangible assets that are not dealt with specifically in other standards. This standard requires a company to recognise an intangible asset if, and only if:

(1) It is probable that the expected future economic benefits that are attributable to the asset will flow to the entity and;

(2) The cost of the asset can be measure reliably (http://www.ifrs.org/IFRSs/Documents/English%20IAS%20and%20IFRS%20PDFs%202012/IAS%2038.pdf).

(3) This standard IAS 38 is particularly covers the following:

- Financial assets
- Exploration and evaluation asset (extractive industries)
- Expenditure on development and extraction of minerals, oil, natural gas, and similar resources
- Intangible assets arising from insurance contracts
- Intangible assets cover by another IFRS, such as intangible held for sale, deferred tax assets, lease assets, asset arising from employee benefits, goodwill.

These listed assets covered by IAS 38 are the same and can be found in firms' investments both in developed and developing countries, Nigerian companies inclusive.

In most countries, managements used their discretion to report IC or intangibles assets in the financial statement before the adoption of IFRS or IAS 38. For example in Australia, managers of companies report acquired and internally developed intangibles (basic research not inclusive) in the financial statement before the adoption of IFRS in 2005 (Wyatt, 2008). Also, New Zealand companies were reporting their intangible asset following the local standards called New Zealand International Accounting standards (NZ IAS) before transition in to IAS between 2005 and 2007 (Austin, 2007).

Malaysia companies did not adopt IAS 38, but adapted IFRS 38 which is a modified version of IAS 38 to Financial Reporting Standard (FRS) 138 issued by Malaysian Accounting Standard Board (MASB) for implementation in 2006 (Shukor et al, 2009). It is the same trend in Nigeria. Nigeria has not fully adopted IFRS or IAS 38, but adopts IAS 38 in the case of business combination in treating "goodwill". All other internally generated intangible assets were not allowed except R&D following SAS 22 guideline.

Since IAS 38 is revised recently not all the countries have adopted it. Moreover, sharing rules is not a sufficient condition to create a common business language, the management incentive and national institutional factors also play important roles in framing financial reporting characteristic (Jeanjean & Stolowy, 2009). Therefore, some countries have different Accounting Standard Boards that issued standards that deal with intangible asset and IC drivers which serve their localities. Examples of

these countries are USA and Nigeria. Thus, Financial Accounting Standard Board (USA) and Nigerian Accounting Standard Board (Nigeria) are discussed below.

2.9.2 Statement of Financial Accounting Standard No 2

Financial Accounting Standard Board (FASB) issued Statement of Financial Accounting Standards No 2 (Accounting for Research and Development Cost) in October 1974. Prior to this period, there was no accounting standard regulating the R&D activities of companies which one of structural capital drivers. Companies choose to report its R&D as it pleases. Some companies expended R&D while few companies capitalised R&D expenditure. With the issuance of SFAS No. 2, companies are guided on how to treat R&D expenditure. The aim of introducing the SFAS No. 2 was to expand the coverage of accounting information and increase the compatibility of financial statement across companies in U.S.

SFAS No. 2 demands managers to expense all Research and Development expenditure as incurred and to disclose the total of these expenditures in the financial statement. FASB suggests three alternative methods of accounting for R&D expenditure. It suggested that companies should (a) charge all costs to expense when incurred; (b) capitalise cost when incurred if specified conditions are met and charge all other costs to expense; and (c) accumulate all costs in a special category until the existence of future benefits can be determined. FASB provided several reasons for concluding that all costs should be expensed as incurred in (a). But concerns for the degree of uncertainty that is associated with the benefit of such expenditure seemed to be the main reason for disclosing the capitalisation of R&D. From the above submission of FASB, companies in US find it difficult to measure and disclosure the IC drivers developed internally even though they can generate future cash flow.

2.10 Financial Reporting in Nigerian Context

After 1960 when Nigeria got her independence, the Nigerian accounting environment mirrored that of the pre- 1967 was UK. In 1979, Nigeria adopted the US presidential democratic system and began to create many of the institutions and regulatory frameworks which were presumed to differentiate the US from the UK. One such institution created in 1979 was the Nigerian Securities and Exchange Commission (NSEC) (Wallace, 1988). The body was charged with the surveillance and development of the overall securities market, the mobilization and formation of capital and the protection of investors. Also included in its mandate is the power to regulate corporate disclosure by companies seeking quotations for their securities (Wallace, 1988).

However, the NSEC has chosen to exercise the right, and has surrendered it (by inaction) to the Nigerian Accounting Standards Board (NASB) founded in September 1982 (Wallace, 1988). In 1979, the Nigerian Stock Exchange (NSE) began to demand that draft annual reports be sent to it for approval before they are printed and circulated by reporting companies to their members for approval at the Annual General Meeting.

The primary source of (mandatory) corporate disclosure rules in Nigeria is therefore the Companies Act 1968. The secondary (obligatory or voluntary) source of companies disclosure rules (including accounting standards) are the NSE and NASB. International Accounting Standards (IASs) and the accounting standards of some developed countries (particularly the UK SSAPs) have tremendous influence on accounting practices and standard-settings in the country. On the impact of IASs, the Institute of Chartered Accountants of Nigerian (ICAN) requires its members to ensure that the accounts of their clients (reporting companies) comply with the extant. IASs not superseded by local standards issued by the Nigerian Accounting

Standards Board (NASB). This Board has issued thirty accounting standards since 1984 when it began to do so of which SAS 22 is one.

2.10.1 Statement of Accounting Standard No 22

In Nigeria, there is no accounting standard on disclosure of Intellectual capital, except standard on research and development, thus, disclosure of other internally developed IC drivers are voluntary. Therefore, there is no uniformity in the information disclosed by Nigerian companies in respect to internally developed IC drivers.

Nigerian Accounting Standard Board issued Statement of Accounting Standard (SAS) 22 in the year 2006. It was an issue relating to Accounting for Research and Development Costs. The guidelines were issued at a time when Billions of Naira were spent on research and development by firms without a specific way of reporting them (Olaofe, 2006). Again, before the issuance of SAS No 22, there was no specific way of accounting and reporting of R&D expenditure; firms choose any method they feel is convenient for them (NASB 2006, SAS No 22, p1). NASB considered two major ways of treating R&D. They are (a) written off and (b) deferral Method.

The Board requires research and development costs to be separated into (a) Research Cost and (b) Development Costs. The Board allows the amount of research cost to be expensed in the period in which they are incurred while development costs may be deferred if the following criteria are met. They are (a) clearly defined product or process with identifiable costs; (b) technical feasibility; (c) intention to produce and market, or use the product or process; (d) ability to complete the project and market the product or process; and (e) current and future assets to be deferred are material and are expected beyond reasonable doubt to be recoverable (NASB, 2006, SAS 22 para 25, p4). However, Development Costs should be amortised over a period not exceeding 5 years from the inception of the benefits.

The financial statement should disclose (1) the accounting policies adopted for development costs (2) the amortisation methods used (3) the useful lives or amortisation rate used (4) the amount of R&D costs recognised as an expense in the period; and (5) a reconciliation of the balance of unamortised development costs at the beginning and end of the period (NASB, 2006, SAS 22 para 36, p6). The components of R&D cost include (a) materials and service costs; (b) salaries and wages; (c) costs of assets constructed or acquired specifically for R&D; (d) depreciation change for R&D assets; and (e) amortisation of patents and licence related to R&D (NASB 2006, SAS 22 para. 13, p2). It should be understood that SAS No 22 which was issued by NASB 2006 is the combination of SFAS No 2 and SFAS No 86 issued by FASB 1974.

In summary, the above accounting regulatory bodies are reviewed because it serves as background for assessing standards issued by various accounting regulatory bodies in which Nigerian Accounting Standard Board (NASB) is part of. And also, to assess the effect of SAS 22 on ICD performance to answer research question 4. The next segment is intellectual capital measurement. Despite the acknowledgement of the importance of intellectual capital in companies' performance yet, there is no consensus to its measurement (Bontis, 1999; NASB 2006, SAS 22 para 20, p4; Nazari, 2010; Shiu, 2006).

2.11 Intellectual Capital Measurement

The motive behind development of Intellectual Capital measurement is that it will allow managers to evaluate their investment in intellectual capital assets as well as their contribution to the company's performance (Sveiby, 1997). Most organizations have only a vague understanding of how much they have invested in intellectual capital let alone what they received from those investments (Buren, 1999). Measurement of intellectual capital is difficult because it is a company's intangible

asset (Guthrie, 2001). It is also because it is without a unique or standard measurement tool supported by financial accounting standard (Nazari, 2010).

The inability of Financial Accounting Standard to provide adequate measurement tool does not allow for easy estimation of intellectual capital investments, even after such investments have been clearly identified (Guthrie, 2001). Thus, without adequate method(s) of measuring intellectual capital, many companies have not been able to realise their full potential (Buren, 1999; Guthrie & Petty, 2000; Sveiby, 1997). Companies either under-invest, or many of their investment are ineffective. Again without standard(s) for measurement, stakeholders have no way to judge and evaluate the value and the effectiveness of their investments in intellectual resources (Buren, 1999). Realising the importance of intellectual capital in knowledge-based economy for sustainability of companies, different researchers and scholars came up (although no unique one) with different measurement tools according to their perceptions of intellectual capital and the aim of the measurement.

Notwithstanding the multidimensionality of intellectual capital measurements arising from different scholars of different disciplines, the aims of measuring intellectual capital resources are in two folds (Marr, Schiuma & Neely, 2004). Marr et al. *(*2004) aver that these two main reasons are: (i) Internal perspective and (ii) External perspective. According to them, internal perspective of measuring intellectual capital is based on the management of intellectual components. If intellectual capital components are identified, the management of the components will be easy to turn into continuous performance improvement (Marr et al., 2004). This assertion is collaborated by Edvinsson (1997) who opines that a company grows because it has hidden values. To keep growing you must surface them, care for them, and transform

them through the business. Thus, if managers can measure their intellectual capital, they will value it (Green, 2008).

For external reason, firms believe that intellectual capital should be measured in other to evaluate and communicate its real value to the market in other to give stakeholders a more comprehensive picture of their asset monetary value and also to showcase their wealth creation potentiality (Rahim, Atan & Kamaluddin, 2011).

In supporting internal reason for measuring intellectual capital by companies, Teeco, Pisano and Shuen (1997) argue further for better value and performance of company based on three paradigms: the competitive paradigm and dynamic paradigm and resource-based paradigm. Two of these paradigms will be discussed here while resource-based paradigm will be discussed later under the underpinning theories to avoid repetition.

2.11.1 Competitive Paradigm

In a knowledge-based economy, the productivity of a firm lies more on its intellectual capital and system capabilities than on its hard or tangible assets (Amir & Lev, 1996; Sarmadi, 2013). Therefore, the focus of manager should be how to provide meaningful guideline to measure and disclosure intellectual capital resource (Albino, Garavelli & Schiuma, 2001; Spender, 1996; Winter, 1987) in other to achieve its competitive advantage capability. This is because organization capability is based on value creation which is a combination of human, process and customer competencies (Marr, et al. 2004). These core competencies represent a domain in which organization excels (Prahalad & Hamel, 1990). Many organizations are still in learning process of pursuing the objective of continuous improvement in their knowledge asset (Senge, 1980). This means that knowledge assets are fundamental strategic levers in order to manage business performance and the continuous innovation of a company (Boisot, 1998; Marr & Schiuma, 2001; Mouritsen, Bukh,

Larsen & Johnson, 2001; Quinni, 1992). For company to succeed in its strategic objective, it needs to know the level of its competitiveness and what capability to grow and maintain (Barney, 1991; Sharkie, 2003).

Porter (1985) proposes that company's competitive advantage can be determined through value added by intellectual capital components (i.e. customer, human and process). According to him, the differences among company's value and competitor's value chains are the source of competitive advantage. He further argues that organization should be prepared to maintain its attractiveness and need to take a step that will uphold this within the industry which it belongs. This can only be done if company utilizes its resource capability in fullest. With competitive paradigm, companies will know what intellectual capital resource to develop, maintain and improve to satisfy the demands of its market (Nazari, 2010; Sharkie, 2003).

2.11.2 Dynamics Paradigm

The dynamic approach to intellectual capital has been developed by intellectual strategist scholars and has its root from resource-based view of firm's resources. This approach aimed at addressing some of resource-based view weakness, by providing a more operational analytical framework (Teece & Pisano 1994). Dynamic capability is the "firm ability to integrate, build and reconfigure internal and external competencies to address rapidly changing business environment ((Teece, Pisano & Shuen, 1997). Teece et al., (1997), definition of capability was criticized by Zollo and Winter (1999), from the perspective that the condition of formation of capabilities is not well defined. They connect capability with routine, especially in the context of what they called "knowledge evolution cycle". They define dynamic capability as "a learned pattern of collective activity through which the organization systematically generates and modifies its operational routines in pursuit of improved effectiveness (Hernandez & Noruzi, 2010; Zollo & Winter, 1999).

In the information era, investments in intellectual capital is considered more to be key strategic element to maintain a business's growth, profitability and competitiveness (Cohen & Kaimenakis, 2007; Kaufmann & Scheider, 2004) which is beyond the scope of resource-based theory. The role of resource-based strategy, as a basis for company's competitiveness, has been criticized as not sufficient enough to sustain company's competitive advantage (Teece & Pisano, 1994).

Teece and Pisano (1994) posit that the innovations maximizing the value of the firm that will lead to achieving competitiveness of the company have to be learnt by managers because many companies have huge valuable resources which are not put to use in their full dynamic capacity. Thus, a firm that is dynamic must understand the change in the environment in which its' operate and ready to reflect this change in its both internal and external competencies to remain competitive (Nazari, 2010), and a going concern. Dynamic capability burgeons as a complementary model of competitive advantage that based its view on the condition of environmental changes of business operation (Eisenherdt & Martin, 2003; Nazari, 2010). A company should be able to match, integrate, build and re-adjust both its internal and external competencies to any change in its environment to remain going concern and competitive (Teece & Pisano 1994).

For external reason for measuring IC, from the literature, it is observed that non-disclosure of intellectual capital in financial statement is affecting the stakeholders especially the investors (Okwy & Christopher, 2010; Holland, 2009) as this will prevent investors to forecast the likely future earnings of their investments (Mouritsen, Bukh & Marr, 2004). Invariably, the stakeholders are not satisfied with this situation. With the stakeholders' pressure increasing coupled with the limitation of the existing financial reporting, companies are now finding a way to measure and

reports their intellectual capital (Guthrie & Petty, 2000) through voluntary reporting. This proactive measure by companies seems to augur well with the stakeholders, intellectual capital-based and resource-based theories. The next section discusses the measurement Model relating to intellectual capital.

2.12 Measurement Model

Arriving at a standard measurement of intellectual capital is a difficult task (Buren, 1999). Greater strides on intellectual capital measurement can come only from collective action because standard measurement requires formalized information sharing, common definitions, metrics and shared methodologies. However, none of these can be accomplished by market force or the isolation work of organizations (Buren, 1999). This is what account for so many IC measurement models.

Given the fundamental flaw of the historical financial measurement and non-theory-based intellectual capital metric, there is a need to develop model such as Skandia's Navigator (Edvinsson, 1997; Sveiby's Intangible Asset Monitor, 1997) as well as other intellectual capital models or frameworks developed by Roos and Roos, (1997); Brooking, Board and Jones, (1998); and Mouritsen, Larsen and Bukh, (2001). These models formed the basis for the development of theory-based intellectual capital metric (Caddy, 2002).

2.13 Intellectual Capital Measurement Model

The realisation of the importance of intellectual capital led to the development of several measurement models for intellectual capital valuation by researchers. For example, (Kavida & Sivakouma, 2009; Sveiby, 2001) classified Intellectual capital models into three, namely: Indirect methods, Direct methods and Scorecard method. This is an extension of the classification made by Luthy (1998). However, Sveiby (2001) classified these model/methods in to two groups. The first group which is called market model falls under Return on Assets and market capitalization and

measures intellectual capital at the aggregate of firm level. The second group of measurement method of intellectual capital is called management model which is sub-divided into Direct Intellectual Capital and Scorecard methods. It measures intellectual capital at the component level (Nazari, 2010).

2.14 Market Models (Market Capitalization Methods)

This method is also referred to as indirect methods by Sveiby (2001), and is financial measures of evaluating intellectual capital. Return on capital methods and market capitalization methods offer monetary valuation which is useful especially to manager in acquisition and stock valuation (Sveiby, 2001). In addition these measurement methods can be used for comparison between companies within the same industry. It is also good for illustrating the financial value of intellectual capital (Kavida & Sivakoumar, 2009). These methods build on the long established accounting rules and are easily communicated in accounting profession (Kavida & Sivakoumar, 2009). Again, it is useful for investor to assess the value of intellectual capital of the companies in which they have invested. Some of the financial measures for valuing intellectual capital under this category are: Market-to-Book -Value Ratio, and Tobin's q.

2.14.1 Market-to-Book-Value Ratio

Market-to-book-value ratio is sometimes referred to as price-to-book-ratio. This method measures the relative value of a company to its stock price or market value. This method adopts the market capitalization method approach (Kavida & Sivakoumar, 2009). They argue that the difference between market value of the company's share and book-value of the assets reported is the "hidden" value of asset not reported which is the intellectual capital resource of such company (Edvinsson & Malone, 1997; Stewart, 1997). According to Edvinsson and Malone (1997) and

Stewart, (1997) market-book-value ratio could provide basis for measuring intellectual capital which the traditional financial measure lacks.

Additionally, Kavida and Sivakoumar (2009), posit that Market-book-value ratio is easy to compute and uphold the principle of transparency. However, in spite all the advantages associated with market-book-value ratio, the method is criticized for its inherent problem. That is, market –book-value ratio can be superficial in trying to translate every element of intellectual capital into monetary terms (Mouritsen et al. 2001; Saenz, 2005).

2.14.2 Tobin's Q

Another financial measure for valuing intellectual capital under market model is Tobin's q. Tobin's q is the same as the market-book value ratio except that Tobin's q uses replacement cost/value of tangible capital, rather than book value of tangible capital in the calculation (Kavida & Sivakoumar, 2009). It adopts market capitalization method approach. Tobin James (1969) introduced q ratio. Since then, Tobin's q has been accepted, used as a measure of corporate performance and as an indicator of intellectual capital. This theory emphasis that if Q of a company is greater than one, and greater than competitor's Q, the company has the ability to produce higher profits than its competitors (Kavida & Sivakoumar, 2009). Thus, the difference between the market value and the replacement cost of tangible capital represent the value of intellectual capital. Bontis (1998), evidence that Tobin's q can only be used as intellectual capital measurement method only if the companies under study have the same characteristics, they belong to the same industry and they are at the same level of operation. This is because Tobin's q is likely to be different across different companies and industries.

In addition, the intellectual capital intensity of companies is likely to be different because the reliance of intellectual capital of individual company cannot be the same

(Bontis, 1998). The shortcoming of the measurement method under this category is that, none of the methods decomposed intellectual capital into components or drivers in other to measure and place value on them as suggested by (Green, 2008). The next category is called Market Model.

2.15 Market Model – Return on Assets Methods (ROA)

Some of the methods that fall under this model are: Value Added Intellectual Capital Coefficient (VAIC), Calculated Intangible Value (CIV) and Economic Value Added (EVA). The initiators and developers (Luthy, 1998; Pulic, 2004, 2000, 1998), in an attempt to have an indicator in other to measure and value intellectual capital contribution developed these methods/models. These methods are discussed below.

2.15.1 Value Added Intellectual Capital Coefficient (VAIC)

Following the debate on intellectual capital value creation, Pulic (2004, 2000, 1998) develops a useful measuring technique in 1998 called Value Added Intellectual Coefficient (VAIC) and further developed by Boremann in 1999. This method gives a new insight to measures of value creation and monitors the value creation efficiency in companies using basic accounting figures. Contrary to the traditional accounting measure that focuses on tangible assets in business reporting, Pulic picks interest in the driver(s)/component (s) that create value (Chang & Hseih, 2011). Pulic (2000), provides that there are two key resources that added value. They are: capital employed which consists of physical and financial capital and intellectual capital that consists of human and structural capital (Chang & Hseih, 2011).

This method is preferred by many researchers because it makes use of audited data from financial statement and minimizes potentiality of subjectivity of data from using other instruments (Chang & Hseih, 2011). It also decomposes intellectual capital to drivers in other to calculate each value created by IC drivers. The VAIC

conceptual model is shown below: VAIC = HCE+SCE+CEE. The full explanation of this model is in chapter three of this study.

2.15.2 Calculated Intangible Value (CIV)

Calculated Intangible Value Added (CIV) is designed to compute the value of a company's intellectual capital. This method attempt to allocate a fixed value to intangible assets that does not change according to the companies' market value. This method was developed to assist companies or businesses that have most of their asset or resources as intangible as they find it difficult to get financial assistance from financial institutions since they do not know the value of their assets (Stewart, 1997).

However, Antola, Kujansivu and Looqvist (2005) posit that CIV is a quantitative method that estimates intellectual capital in monetary unit. The method assumes that a company's premium earnings are greater than that of its competitors in the same industry based on its intellectual capital valuation (Kujansiva & Lonnqvist, 2007).

Kujansiva and Lonnqvist (2007) further argue that by utilising tangible assets, a company can only reach an average level of earning and the premium is generated through the intellectual capital embedded in the company. CIV has six steps to follow in order to calculate intangible value (Stewart, 1997). The steps are: calculate the company's average pre-tax earnings for the last three years; calculate average year-end tangible assets of the company for the last three years; divide the earnings by the tangible assets to get the company's return on tangible asset (ROA); calculate the average ROA for industry for the last three years; if and only if the return on tangible assets of the company is greater than the return on tangible assets of the industry, executing the method can be continued; calculate the "excess return" by multiplying the industry ROA by the average year-end tangible assets of the company. Subtract the result from the pre-tax earnings of the company. Multiply this

by the following clause. One less than the three year-average income tax rate of the company; and then divide the after-tax number by an appropriate percentage (i.e the company's cost of capital (Kujansiva & Lonnqvist, 2007).

This method is criticized because of its rigidity; the opponent believing that market value constantly changes, the intangible value of intellectual capital (asset) changes also. This makes the method to lose its credibility in measuring intellectual capital (Bontis, 1999).

2.15.3 Economic Value Added (EVA)

Economic Value Added was introduced by Stern Stewart & Co, a New York-based consulting firm in the late 1990s as a technique to assist companies to pursue their financial directive. It is intended to aid maximising the wealth of the shareholders (Sullivan, 1998) which cannot be done by the use of return on asset and return on equity (Bontis, Drangonetti, Jacobson & Roos 1999). This method is viewed by Nazari (2010) as a good indicator to measure economic profit of both tangible and intangible assets. EVA is the difference between a company's net operating profit after tax and the cost of capital of both equity and debt (Chen & Dodd, 2001).

It is a comprehensive financial management measure that can be used to tie together capital budgeting, financial planning, goal setting, and performance measurement (Bontis et al., 1999). It also allow manager to take appropriate decision in order to maximize shareholders' wealth at the same time a good channel to communicate share value to the shareholders (Bontis et al., 1999). Stern Stewart & Co. avers that EVA is the only measure of performance that accounts for the complexity involve in creating value.

Mcconville (1994) assumes that economic value added is almost the same thing with Residual Income (RI) which is well known to accountants. RI is the value remaining after shareholders and all other providers of capital have been paid or settled.

Mcconville (1994) posits that EVA is a benchmark for managers to compare project and respond to the pressure for performance accountability through the use of an appropriate metrics which is widely accepted. Hence, EVA is a measurement technique to calculate return on intellectual capital (Marchant & Barsky, 1997). In contrast, Andriessen (2004) and Mouritsen (1998) submit that EVA method is not a good technique for measuring intellectual capital because it ties both financial and non-financial indicators together while the two are loose in intellectual capital (Nazari, 2010).

2.16 Management Model

Management models are usually called direct intellectual capital methods because this it is based on monetary unit assumption (Kavida & Sivakoumar, 2009). These methods estimate each component of intellectual capital based on its monetary value (Sveiby, 1997), and make use of internal generated data. Human Resource Accounting (HRA) is a method under this model.

2.16.1 Human Resource Accounting

Evaluation and measurement of human asset has generated numbers of debates between accountants and human resource theorists (Hermanson, 1964). The debate is borne out of the fact that it is an intangible asset without a standard measurement tool. Human capital is the estimate of human factors in the company (Bontis et al. 1999) that represent their intelligences, skills and expertise that gives the company its unique character. From the unset, the aim of HRA is to “quantify the economic value of people in the organization” to provide input for managerial and financial decision (Flamholtz, 2005).

The researchers who have shown interests in HRA have suggested three type of human resource accounting measurement models. They are (i) Human Resource (HR) Value Models which combines non-monetary behavioural with monetary

economic value models; (ii) Cost Models and Monetary Emphasis Models that consider the historical, acquisition, replacement or opportunity cost of human assets; and (iii) Monetary Emphasis Model which calculates discounted estimate of future earnings or wages (Bontis et al., 1999; Chen, Zhu & Xie, 2004).

Importantly, HRA has made significant contributions in the 1970s and it is on this note that it is regarded as an important measure of human capital a component of intellectual capital (Chen, et al, 2004). It evaluates human capital in financial term and is extensively used in service companies (bank, accounting firms, insurance companies and other financial service firms) where human capital is basically their major organizational value (Bontis, 1999; Chen, et al., 2004). Human Resource Accounting, as a measure of intangible asset, is criticised for its subjectivity and uncertainty (Hekimian & Jones, 1967). Therefore, its reliability is questioned because firstly it requires many assumptions which are not real and secondly it violates common sense reasoning (Chen et al., 2004).

Moreover, HRA deals with the valuation of human capital only without taking in to account the other elements of IC such as customer, internal and structure aspects (Chen, et al. 2004). However, without these elements, it is difficult if not impossible to measure or value human capital (Subramania & Youndt, 2005) because of the interconnectivity of all the components of intellectual capital.

2.17 Scorecard

The intangible components are not linked with the organization strategic objective (Kaplan & Norton, 2001) by other intellectual capital measurement models and they are better predictor of short-term performance methods. This assertion led to development of several scorecard methods believing that scorecard methods would provide better indicator to link both tangible and intangible assets of a company to long-term success (Bontis, et al 1999; Johanson, Martensson & Skoog, 2001;

Mouritsen, Larsen & Bukh, 2005). Examples of this method are Balanced Scorecard and Intellectual Capital – Skandia Navigator

2.17.1 Balanced Scorecard

Balanced scorecard approach presumes that companies should measure their performance in order to "balance" the financial perspective. After a 'multi-year, multi-companies study' sponsored by Harvard Business School, Kaplan and Norton (1996), propose that managers need a multi-dimensional measurement system to guide their policy making and suggest a "balanced scorecard" approach to measure performance (Bontis et al. 1999; Chen et al., 2004). This was the first attempt to encourage companies to measure both their financial and non-financial indicators (customer perspective groups, the internal business process and growth perspective) and linked these measures in a systematic and coherent nature (Bontis et al., 1999). As at the time of introduction of Balanced Scorecard (BSC), the concept of intellectual capital was not in the picture (Chen et al., 2004).

The balanced scorecard does not consider human resource as part of intellectual capital, thus overlooked the importance of human resource which is (significance of knowledge management) a critical success factor of the new economic entity as well as the key to its long-term survival (Bontis, et al., 1999; Chen, et al, 2004). The main aim of balance scorecard is merely to supplement the traditional accounting balancing perspective by adding non-financial perspective measure (Chen, et al., 2004). Another method under this category is Intellectual capital – Skandia Navigator.

2.17.2 Intellectual Capital – Skandia Navigator

The wave of interest of intellectual Capital was sparked off by a few companies (Skandia, Dow Chemical and the Canadian Imperial) of which the representative is Skandia. Skandia which is the largest insurance company in Sweden (Bontis 1999;

Chen et al., 2004) realised that the existing accounting framework cannot address the issue of intellectual (intangible) resource.

Skandia appointed Leif Edvinsson as director, to develop a new model to solve the problem of intellectual resource reporting. Edvinsson developed a dynamic and holistic intellectual capital reporting model named the Navigator (Bontis et al., 1999). Skandia Navigator divided IC in three main groups: organization (structural) capital, customer capital and human capital and placed values on these capitals accordingly using Skandia value Scheme, 1998. Thus, intellectual capital is a practitioner-created concept.

According to Skandia's model, intellectual capital was categorised into human capital and structural capital (Edvinsson & Malone, 1997). Human capital is delineated as the employees' competence, inter-relationship ability and value, while structural capital can be described as "what remains in the company when employee go home" (Roos et al., 1997) such as brands, patents, processes, organizational structure and concepts.

In Skandia's Intellectual Capital Value creation model, structural capital is divided into organizational capital and customer capital. By and large, Skandia's value-scheme covers both financial and non-financial measures to estimate the company's market value (Chen et al., 2004). It goes further to create taxonomy to measure a company's intangible assets as well as to advise companies to look beyond the traditional financial indicator to measure the value of a company.

Skandia also provides a broad coverage of organizational structural and process resources that have not been attempted before (Bontis, 2001).

In summary, the IC measurement models developed in the area of intellectual capital measurement were reviewed above. Each of these models has different method of

measuring IC. These methods deal with intellectual capital to suit reason for intellectual capital measurement and the availability of data for analysis. All the methods were developed to assist in financial reporting of intellectual capital to complement the traditional financial data which has it shortcoming in measuring, valuing and reporting of intellectual capital in financial statement.

The Intellectual Capital Measurement still remains the best way or method of valuing and reporting intellectual capital information in the financial statement (Nazari, 2010). Of all available IC measurements, this study prefers VAIC developed by Pulic (2004, 2000, 1998) because of its robust acceptability and its ability to measure the efficient usage of all IC components based on IC drivers. In addition, VAIC provides a standardized and consistent measure that can be used to conduct comparative analyses across various sectors locally and internationally (Shiu, 2006). However, this study covers one hundred and seventeen public listed companies whose operations cut across different sectors of the Nigerian economy, thus, the research deem it fit to use VAIC model.

2.18 Underpinning Theories

Different theories have evolved to explain and analyze the contribution of IC in relation to value creation and its disclosure. Each of these theories approaches these concepts in slightly different way, using different terminology. They are also viewed from different perspectives arising from different usage (investors or financial analyst). For example, studies conducted while investigating value-relevance of intellectual capital asset use intellectual capital theory and resource-based theory, while, stakeholder is used to support IC disclosure. However, it is increasingly argued that there is a need for a more multi-theoretic approach towards understanding and decomposing of IC for the sake of measuring, managing and disclosing such asset (Green, 2008; Vergauwen et al., 2007). As such, the

development of the research hypotheses pertinent to this study is largely guided by three key theoretical perspectives, namely: Resource-based theory, Intellectual Capital theory, and Stakeholders theory.

2.18.1 Resource-Based Theory

According to resource-based view, companies gain competitive advantage and superior financial performance through the acquisition, holding and subsequent use of its strategic assets (Penrose, 1959; Wernerfelt, 1984). The advocates of resource-based paradigm consider intellectual capital to be a strategic asset because IC has the potentiality of linking its components (resources) with company's performance (Riahi-Belkani, 2003; Seethamraju, 2000). Hence, companies are distinguished by these exclusive non-substitutes, inimitable resources (Barney, 1991; Lev, 2001; Nelson & Winter, 1982).

Adopting an internal perspective of firm, the resource-based view is used to explain how a company's distinct collection of internal resources and capabilities constitute the basis for developing strategies for value creation (Abdulai et al. 2012; Barney, 1991). Variance in company's resources and capabilities dictates differences in strategies developed, thus, accounting for performance differences across company or firm (Michael, Leaonard, Kat-Shuhiko & Rahul, 2001).

Empirical evidences have shown that intellectual capital is a dominant factor that relates to company performance. For instance, in the view of economists' framework, Gjerde et al (2007) assess the value creation of three sources of competitiveness of company: industry-based competitive advantage and two firm-specific, resources-based competitive advantages relating to profitability and risk. Applying abnormal stock returns as the valuation variable; the result shows that the firm-specific advantage is three (3) to four (4) times more value creation potentiality than the industry-specific advantage.

Another study using resources-based view is the work of Ethiraj et al. (2005). They examine the source of competitive advantage of a large Indian software company with about 90% of revenues from exports. The study data include information on revenues, cost, factor input, capabilities measures, and various projects characteristics, such as size, clients industries, and innovation development projects, all measured at the project level. The result of the study provides that two sets of firm-specific capabilities are crucial sources of competitive advantage: (1) client's specific capabilities and project management capabilities. Employing non-financial and financial measures, they found that the companies developed these capabilities through learning-by-doing as well as sustained investments (Wyatt, 2008). The study concludes that the two sets of capabilities contribute heterogeneously to value creation.

The RBV theory is one of the theoretical frameworks employed in this study as it has been widely used in studies relating to IC value creation and company performance. A company's ICs attribute tends to be tacit, firm specific, and developed over a long period. To this extent, intellectual capital drivers are companies' specific and different across companies (Muhanna & Stoel, 2010). The opponents of this theory argue that it is too general when relating company's resource to competitive advantage and drawn up a new theory called Intellectual Capital-Based Theory.

2.18.2 Intellectual Capital-Based Theory

It is difficult to conceptualize and then measure a concept that is based on some firm-specific interaction of resources, which themselves are intangible (Reed, Lubatkin & Srinivasan, 2006). The above submission suggests that Resource –based theory is not suitable as it combined intangible resources in explaining the competitiveness of company's capability. In resolution to this criticism Peteraf and Barney (2003),

drawn from an emerging mid-range theory, an Intellectual Capital-Based View (ICV) of firm was developed.

According to Peteraf and Barney (2003), Intellectual capital-based view is a mid-range because it ICV) view each intellectual capital drivers (resource) in a more specific way than RBV. Also ICV systematically considers the three resource narrowly that been theoretically linked to a firm competitive advantage (Reed et al, 2006). Edvinsson and Malone, (1997; Wright, Dunford and Snell, (2001) submit that ICV deals directly with Knowledge that is created and stored in company's three capital components i.e. in its people (human capital), social relationship (Social/Relational capital), and information technology systems and processes (organizational/structural capital).

The view of intellectual capital-based reflects the strategic management view point of intellectual capital is the view shared in this study as intangible resources have been empirically evidence as performance influencing factors within and across companies/sectors (Abdulai et al. 2012; Carmel, 2003; Heeks & Nicholson, 2002) and elsewhere (Cantrell et al., 2006; Seleim et al. 2007) such as Nigeria.

In view of the above submission, this present study evaluate IC efficiency by combining the two value added indicators from IC (human capital and structural capital) with financial/physical capital (capital employed) as argued by RBV and ICV theories based on VAIC model. VAIC model developed by Pulic (2004, 2000, 1998) combined both IC and tangible (financial/physical) resources to measure the efficiency use of company's resources.

2.18.3 Stakeholders Theory

Following the stakeholders' theory, managers should avoid whatever will jeopardize the interest of the stakeholders but should strive to communicate to the public whatever business operation that will be in the best interest of the stakeholders.

Therefore, they must set out their strategic plan to satisfy the stakeholders or a group of individuals who have a stake in the company (Nazari, 2010). Managers must define their strategic objective that will take into account the relationship that exist between its employees, process, customers and the interest of its stakeholders to achieve its long-term success (Freeman & Mcvea, 2002).

Stakeholder theory is widely used to address problems of information asymmetry in the market (Srinivasan & Hanssens, 2009). This theory believes that managers will voluntarily disclose any information that will be of interest to the stakeholders such as investors, creditors and others (Abeysekera, 2007). When applied to company disclosure practices, stakeholder theory proposes that it would be generally beneficial for companies to disclose intellectual capital information that shows the companies' performance that is rewarding and good for investors and creditors in decision making. Disclosure is expected to minimize any potential for investors' devaluation of the company (or alternatively, to maximize the potential) for firm value enhancement.

Based on the stakeholder view, Abdolmohammadi (2005) examines the intellectual capital disclosure of US companies. Also investigates the disclosure of R&D with market value. The results provide that the companies that disclosed their IC information have higher market value. In summary, this study is based on the above discussed theories because companies' resources for business operations comprises of both tangible and intangible resources supporting RBV theory and Intellectual capital-based theory, while stakeholders' theory is in support of IC disclosure. Therefore, the RBV and ICV are used to support the IC efficiency examined in this study while stakeholder's theory is used to support the assessment of voluntary IC disclosure of the sampled companies.

2.19 Chapter Summary

This chapter presents IC definition, IC components, IC drivers, and related literature on IC efficiency in relation to company performance. Intellectual capital disclosure studies, IC Measurement and underpinning theories. Next chapter deals with research framework for this study**.**

CHAPTER THREE

RESEARCH FRAMEWORK

3.1 Introduction

This section deals with the research framework used in this study. The framework is arrived at after reviewing the prior related literatures and theories. The chapter includes adopted research framework and research hypotheses.

3.2 Adopted Research Frameworks

This study adopted the research frameworks of Maditinos et al. (2011), Calisir et al. (2010) and Shiu (2006) to examine IC efficiency in relation to company performance. To differentiate between this study research framework for IC efficiency and the adopted research framework, Table 3.1 below presents the IC components, company performance, control variables and the measurement variables with the sample size of the adopted frameworks.

Table 3.1
Adopted Frameworks and their Variables

Author and year	**Variables**	**Drivers/indicator**	**Sample size**
Calisir et al. (2010)	IC components:		14 companies comprised of 2 sectors
	HC	Salary and wages	
	SC	Software system, distribution networks, Supply chain, brand, Management process and customer loyalty	
	CE	Book value of net assets	
	Company performance:		
	Profitability	Ratio of operating income-to-book value of total asset.	
	Productivity	Ratio of total revenue to book value of total assets.	
	ROE	Ratio of net income to total shareholders' equity.	
	Market valuation	Price per share multiple by the number of outstanding shares.	
	Control variables:		
	Leverage	Ratio of total debt to book value of total assets.	
	Size	Natural logarithm of market capitalization.	

Table 3.1 (Continued)

Author and Year	Variables	Drivers/Indicator	Sample Size
Maditinos et al. (2011)	IC components:		96 companies comprised of 4 sectors
	Human capital	Salary and wages	
	Structural capital	VA minus HC	
	Physical capital:		
	Capital employed	Total assets minus intangible assets	
	Financial performance:		
	Return on Equity (ROE)	Net income divided by shareholders' equity	
	Return on asset (ROA)	Net income divided by total assets	
	Growth Revenue (GR)	Sales Revenue	
	Market performance:		
	Market to-book ratio	Market value divided by book value.	
Shiu (2006)	IC components:		80 companies comprised of 1 sector
	HC	Salary and wages	
	SC	VA minus HC	
	CE	Book value of net assets	
	Company performance:		
	ROA	Ratio of the net income divided by	

		book value of total assets.
	Asset Turn Over (ATO)	Ratio of the total revenue to total book value of assets.
	Market Book (MB)	Share price multiple by number of outstanding common share to book value of net assets.

Table 3.1 (Continued)

	Control variables:	
	Size	Natural log of total market capitalization.
	Leverage	Total debts divided by book value of total assets.
	ROE	Ratio of the net income divided by book value of shareholders' equity,

The present study differs from the above frameworks adopted in the following: Human capital value indicators were expanded with compensation cost and welfare package costs based on the submission of IAS 38 (2004) and Skandia Value Scheme (1998) that they are human capital value indicators. On the hand, structural capital value indicators were expanded with and intellectual property (patent) based on the suggestion of Hall et al. (2005) and Wyatt, (2008) that patent is output metric of

R&D. It is important to note that, the indicators of structural capital were not always included in VAIC model but in IC components measurement variables see for example (Calisir et al, 2010; Nazari 2010).

In addition, most, if not all, the previous studies which have used the Pulic VAIC Model of intellectual capital value creation, to test efficiency of IC neglected the connectivity of different IC drivers. Issue of the interconnectivity of IC components pointed out by literature especially Hubert Saint-Onge, Stewart and Sullivan (1998) tend to be ignored in most of the previous IC studies. It is on this note that this study combined three to four IC drivers in evaluating IC efficiency.

The objective of this study is to provide a better understanding on intellectual capital efficiency and company's performance. This is necessary within the organization to improve their understanding on the resource that creates value so as to manage companies' resources efficiently. Having reviewing the prior related literatures, theories and previous IC framework on IC efficiency the researcher comes up with this study's theoretical IC efficiency framework illustrated in figure 3.1.

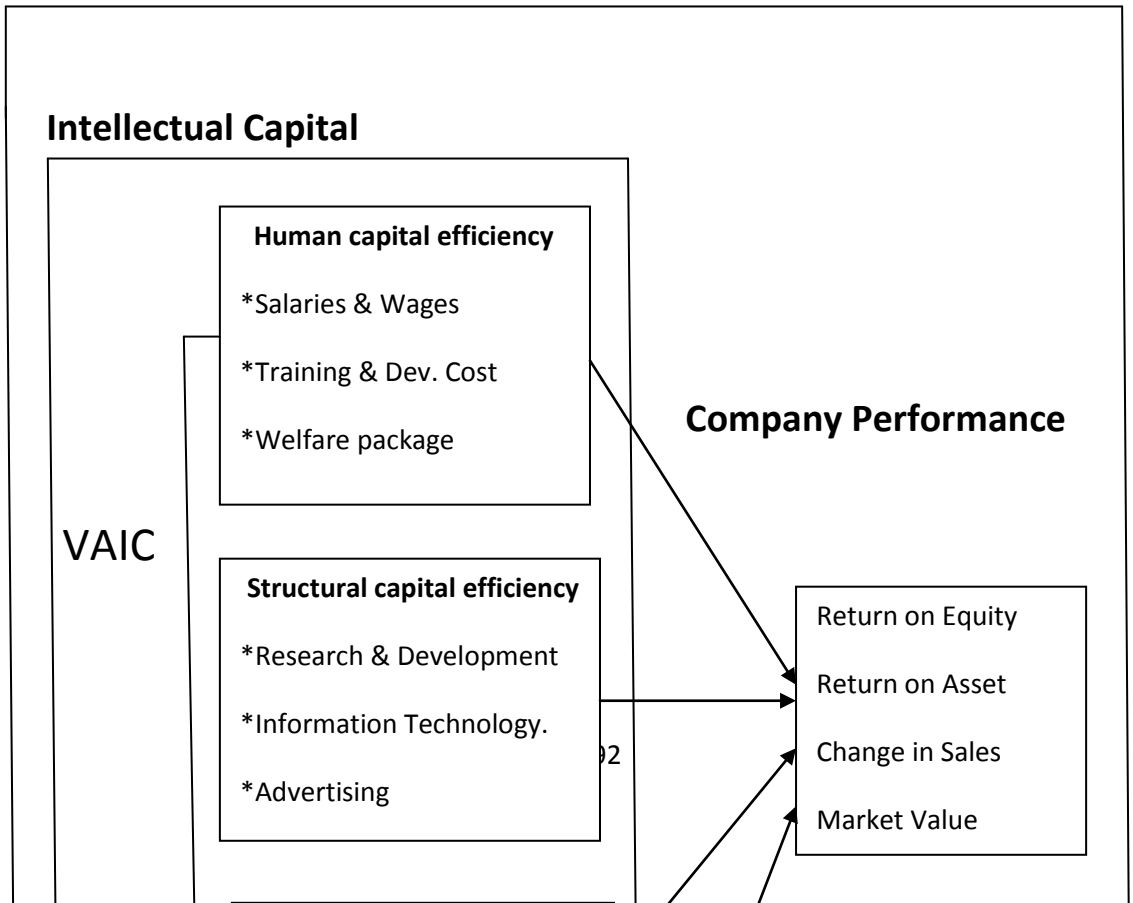

Figure 3.1
Research Framework (IC efficiency and Company performance)

It is important to note here that, the way this study measure sector for IC efficiency was different from the way it was measured under IC disclosure. Further explanation on this is in variables measurement in the next chapter. The next session discusses the research hypotheses.

3.3 Development of Research Hypotheses

The main objective of the study is to examine intellectual capital efficiency and companies' performance in Nigeria. In order to answer research question 1, 2 and 4, there is the need to assess the ICD practice/performance of the sampled companies. Therefore, the study hypotheses cover both IC efficiency and ICD.

3.3.1 Intellectual Capital Efficiency and Companies' Performance

Several studies have been conducted to find the relationship between intellectual capital components efficiencies (Human capital efficiency and structural capital efficiency) and between corporate performances in various countries but not limited to these. For example studies in USA (Abdohmohammadi, 2005; Huseman &

Goodman, 1999), UK (Aboody & Lev, 1998), North America (Bontis & Fitz-enz, 2002; Bontis, 1998) Germany (Vergauwen, Bollen & Oirbans, 2007; Bollen, Vergauwen & Schieders, 2005) South Africa (Firer & Williams, 2003), Singapore (Tan, Plowman, & Hancock, 2007), Bangladeshi (Al-Mumum, 2009), Japan (Al-Twaijry, 2009), Malaysia (Salamudin, Bakr, Ibrahim & Hassan, 2010).

3.3.1.1 Human Capital Efficiency and Companie's Performance

Researchers consider Human capital as part of the total asset of company that should not be left when evaluating company performance based on each asset invested by company because of the influence that they can exert on companies' performance (Al- Mamun, 2009; Sveiby, 1997). Human capital as an asset expected to create value in upgrading companies' human resource via employee related knowledge, competencies and skill (Abeysekera, 2007; Beattie & Smith, 2010; Chief Financial Officer (CFO) and Research Services and Mercer Human Resource Consulting, 2003). Human capital drivers such as employee skills, education, abilities, commitment and employee training and development are considered to contribute to value creation (Beattie and Smith 2010).

In addition, in keeping with the changes in corporate valuation the new value driver such as human resource should be well managed by companies to remain competitive in the market, thus assisting firms to create value (Salamudin et al, 2010). Value creation can take the form of Human resource improvements and improvement in human resource management, which later improve the overall performance of companies (Okwy & Christopher, 2010).

CFO Research Service and Mercer Human Resource Consulting (2003) conducted a survey on Human resource management: The CFO's perspective, as reported by Kouhy, Veddy, Yoshikhawa and Innes, (2009), find out that CFO now recognize the importance of human capital in measuring return on investment and its effect on

overall performance of companies' assets. In addition to this the study, evidence provides that large companies want to measure the influence of human capital on the attainment of the companies' objectives.

The over view of this study is that CFO now recognize the contribution of human capital as a means of measuring and managing this important asset. In the same direction is the work of the Chartered Institute of Personnel and Development (CIPD) (2003) which pointed out that measuring human capital will lead to Human resource policies and practices. Also this will show the difference between the actual value added by employees and potential value added of employees. The study reveals that there is a correlation between the companies' performance and Human resource management/investment. In addition, Suraj and Bontis (2012); Okwy and Christopher (2010) argue that quality of management and employees are key determinant factors in investment decision in Nigeria. They further reveal that the stocks of companies with poor quality manpower are associated with high risk. Hussin and Salim (2010) stress the importance of compensation in evaluating executives' performance in Malaysian companies. They found that companies' that adopt performance-based pay with adequate structured remuneration committee have higher pay-for-performance elasticity and the executive performance can be linked with performance.

Therefore, this study assessed the contribution of human capital efficiency towards the company performance by expanding the human capital value indicators with welfare package and compensation cost as suggested in the Skandia Navigator Value Scheme of (1998) and IAS 38 (2004). The theoretical and empirical studies discussed above lead to the second, third and fourth propositions that Human capital efficiency is positively related to companies' performance.

Hypothesis 1: There is a positive relationship between human capital efficiency (HCE) and return on asset (ROA) *Ceteris Paribus.*

Hypothesis 2: There is a positive relationship between human capital efficiency (HCE) and return on equity (ROE) *Ceteris Paribus.*

Hypothesis 3: There is a positive relationship between human capital efficiency (HCE) and changes in sales (CIS) *Ceteris Paribus.*

Hypothesis 4: There is a positive relationship between human capital efficiency (HCE) and market value (MV) *Ceteris Paribus.*

3.3.1.2 Structural Capital Efficiency and Companies' Performance

This capital provides the structures and procedures within the organization that can be used by the employees to put their knowledge and skill to the best use; and provides the best practice in which human resource can be fully utilized. Some of empirical studies on intellectual capital that have made use of structural capital as driver of IC efficiency performance are (Abdolmohammadi, 2005; Abeysekera, 2007; Brennan, 2001; Chang & Hsieh, 2011; Guthrie 2001; Tan et al., 2007). They argue that this capital can be separated and can be measured as a function to performance. Chang and Hsieh (2011) investigate the different components of intellectual capital of 367 Taiwan companies using Pearson correlation and linear multiple regression. The result of the study shows that there is an association between structural capital efficiency and companies' operating, financial and market performance.

Tan et al., (2007), who conducted a study on 150 Irish companies averts that there is a correlation between structural capital efficiency and companies' performance, and the correlation is significant at 5% level. This study provides evidence on the importance of structural capital in value creation using Pulic's method (VAIC) to show a dollar value attribute of structural capital (STVA) on companies'

performance. Also, Guthrie (2001) provides that structural capital is resource/asset to determine a company's value. Hamzah and Isa (2010) argue that the most relevant component of intellectual capital is structural capital among the Malaysian's ICT companies. In addition to the above studies is the work of Suraj and Bontis (2012) who provide evidence that infrastructural capability of a company is the key element to company performance.

Thus, this study intends to examine the structural capital efficiency with addition of intellectual property (patent) value indicator that has not been examined in conjunction with R&D, IT and advertising by previous studies. The theoretical argument and empirical studies discussed above, lead to the sixth, seventh eighth and the ninth propositions that structural capital efficiency is associated with companies' performance.

Hypothesis 5: There is a positive relationship between structural capital efficiency (SCE) and return on asset (ROA) *Ceteris Paribus.*

Hypothesis 6: There is a positive relationship between structural capital efficiency (SCE) and return on equity (ROE) *Ceteris Paribus.*

Hypothesis 7: There is a positive relationship between structural capital efficiency (SCE) and changes in sales (CIS) *Ceteris Paribus.*

Hypothesis 8: There is a positive relationship between structural capital efficiency (SCE) and market value (MV) *Ceteris Paribus.*

Hypotheses 9, 10, 11 and 12 were used to test the capital employed efficiency in relation to company performance as this component is part of VAIC model used in this study.

Hypothesis 9: There is a positive relationship between capital employed efficiency and ROE *Ceteris Paribus*

Hypothesis 10: There is a positive relationship between capital employed efficiency (CEE) and ROA *Ceteris Paribus*

Hypothesis 11: There is a positive relationship between capital employed efficiency (CEE) and CIS *Ceteris Paribus*

Hypothesis 12: There is a positive relationship between capital employed efficiency (CEE) and MV *Ceteris Paribus*

3.4 Intellectual Capital Disclosure

IC disclosure has been addressed by many researchers (Abeysekera, 2007; Abeysekera & Guthrie 2005; Guthrie & Petty, 2000; Rahim et al. 2011), to mention a few. Abeysekera (2007) observes that some of Australian studies provide evidence that disclosure of IC is mostly practiced by large firms with highly IC intensity. He observed further that IC disclosure was given a priority because it is considered as source of value for most of Australia companies.

Guthrie and Petty (2000) submitted that most of the Australian firms' that disclosed their intellectual capital information are better place in the market. Abdolmohammadi (2005) provides evidence that IC information is correlated with market value especially the emerging companies in US. Ludumila et al. (2008) examined IC disclosure practices of four different sectors in UK. They found that there are differences in IC disclosure pattern of these sectors. The study further reveals that firm size and company nature (sector) are main issue that determine the extent of IC disclosure.

In another study by Shukor et al. (2009) in Malaysia evidence that accounting regulation in a weak and strong economy also affect IC disclosure of companies. Rahim et al. (2011) reveal that most of the Malaysian Technological companies disclose relational (external) capital more than human and structural capitals. The

theoretical argument and empirical research discussed above lead to the following proposition.

Hypothesis 13: There is difference between IC disclosure categories (HC, SC and RC) of the sampled companies.

Hypothesis 14: There is difference between ICD practice “old” and “new” companies

Hypothesis 15: There is difference between ICD performance of sampled companied “before” and “after” release of SAS 22.

3.5 Chapter Summary

This chapter outlines the research framework and hypotheses development. Fifteen hypotheses were developed for this study based on the previous studies and IC framework for both IC efficiency and IC disclosure.

CHAPTER FOUR
RESEARCH METHODOLOGY

4.1 Introduction

The main factor in the operation of any research work is the appropriateness and suitability of a research design for the purpose of the main work (Akwezuilo, 1994). The development of the research methodology is to (1) explain the research design to use in the study. Oloyo (2001) suggests that one of the first steps in describing the research methodology is to 'explain which data are needed to solve the problems, why these particular data are essential and (2) how they are obtained'.

This chapter discusses the overall research processes of data collection and analysis. It identifies the construct to be used as basis for data collection, the selection of suitable respondents as research subjects, and detailed the research design that places the research within a recognized and acceptable framework. This chapter comprises of six sections. The first section in this research work discusses the research design. The second section highlights the research population and sample size. The third section provides the research instrument, while the fourth section outlines the research data collection procedure. The fifth and sixth sections provide discussion on the data analysis methods employed to answer the research hypotheses respectively.

4.2 Research Design

Research design is one of the basic steps in carrying out a research project in line with the objective of the study. According to Cavana, Delahaye and Sekaran (2001) research design is defined as series of rational decision making choices. Articulating its importance, Sekaran and Bougie (2009) describe research design as a master piece that specifics the techniques and procedures for collecting analysing required and needed information. Kumar (1996) aver that there are two main parts in research design: (1) procedure identification or/and development and any arrangement necessary to start the study; and (2) assurance that objectivity, validity, and accuracy

are achieved through careful planning of research procedures. The main objective of the research design is to ensure that the data obtained enables the researcher to answer the research questions as unambiguously as possible (Tabachanick & Fidell, 2007).

It is necessary in order to guide researcher in such a way that requisite data can be easily gathered and analyzed to reach a rational solution to the problem highlighted (Sekaran & Bougie, 2009). "The extent of scientific rigor in a research study depends on how carefully the researcher/manager chooses the appropriate design alternatives, taking into consideration its specific purpose" (Sekaran & Bougie, 2009). In other words, research design provides the general overview of the whole study (Hair et al. 2010; Sekaran & Bougie, 2009). As such, the importance of having a proper research design for a study cannot be over emphasized. Thus, this study employed quantitative research.

Quantitative research design is a systematic empirical investigation of two or more phenomena (Hair et al. 2010). The aim of research approach is to develop and employ hypotheses pertaining to specific phenomena (Sekaran & Bougie, 2009). This approach is suitable and normally used in social sciences research (Hair, Black, Babin, Anderson & Tatham, 2010; Sekaran & Bougie, 2009). Also, this approach is appropriate for this study because the researcher uses ready made available audited annual reports from archive of the Nigerian Stock exchange. It is a printed document that cannot be altered used for an empirical work conducted within the social sciences research (Accounting) to test ten hypotheses.

Using quantitative approach, data for this study was gathered through quantitative method. This method helps to strengthen the reliability of the instrument. Also, quantitative research design avails the researcher opportunity to measure data

without getting involved in the study (Hair et al. 2010), hence, minimising bias (Creswell, Vicki & Clark, 2007). This method also permits generalization of findings by including every segment of the population in the study through a careful selection of appropriate sample**.** Sekaran and Bougie (2009), argue that application of quantitative method as research design is appropriate.

According to Sekaran and Bougie (2009) and Cavana et al. (2001) four basic aspects that influence the quantitative research design to establish that a change in the independent variable causes a change in the dependent variable are: (1) The independent and the dependent variables should co-vary; (2) The independent variable (s) should precede the dependent variable; (3) No other factor should be a possible cause of the change in the dependent variable and (4) A logical explanation (a theory) is needed about why the independent variable affects the dependent variable. They explain that the two variables to change in conjunction with each other. The independent variable (s) presumed causal factor, and others variable(s) are presumed to be constant (*ceteris paribus*). By theorizing, they argue that the amount of theoretical perspective that guides a study also influence the quantitative research design. This study is theory driven. It is guided by the resource-based theory, intellectual capital-based theory and stakeholders' theory. These theories postulate that the intellectual capital adds value to the company's performance and its disclosure serves as useful tool for stakeholders in making rational investment decision (Okwy & Christopher, 2010; Barney, 1991).

4.3 Population

A population is defined as "the entire group of people, events, or things of interest that the researcher wishes to investigate" (Sekaran & Bougie, 2009; Cavana et al. 2001). It is a collection of elements about which researcher wishes to make an inference (Scheaffer, Mendenhall & Ott, 2006). The target population for this

research study are public listed companies in Nigeria or any other publicly listed companies situated in Nigeria. In Nigeria there are two hundred and thirteen (213) public listed companies (Nigerian Stock Exchange, 2000). This figure stands for the total population of the public listed companies. Therefore, 213 listed companies stand for the population for this study.

4.4 Sample Frame

A sample frame is a list of sampling units (Scheaffer et al. 2006). Therefore**,** sample frame for this study is Nigerian Stock Exchange facts' book of 2009 which comprises the list of all the public listed companies in Nigeria. Although, the sample selection for this study was based on the record from the list of the public listed companies in Nigeria obtained from the Nigerian Stock Exchange, the issue of intellectual capital disclosure concern all the public listed companies, exclusion of financial institutions/companies was done based on the capital structure, regulation framework as well as to reduce the tendency of being bias.

The capital structures of financial companies are different from other companies. Their capital structures are purely equity which is based on deposits (Naceur & Ghazouni, 2007). There are sixteen (16) sectors that make up the Nigerian economy. Out of these sixteen sectors (16), making up 213 companies, fourteen (14) sectors making up of 165 companies (excluding financial institutions) were selected for data collection. For better understanding and comparison, this study merged these fourteen (14) into eight. The study merged these sectors because some of these companies are similar in nature, as such the researcher merged two or more sectors that are similar to become one. For example, information technology companies, technology, communication and media could be one as information, communication and technology (ICT). Numbers of companies picked from each sector was based on

how many companies are in each sector and the intellectual capital intensity of such companies.

4.5 Research Sample

A sample is a collection of sampling units drawn from sample frame (Scheaffer et al. 2006). It is a subgroup from the entire population that the researcher wants to examine (Sekaran & Bougie, 2009; Cavana et al. 2001). However, an appropriate sample is needed to reach a reasonable conclusion and effect generalization upon population in which the sample is representing (Sekaran & Bougie, 2009; Cavana et al. 2001).

For the purpose of this study, among the population a representative sample is drawn in two stages. Two stages of sampling methods were used in this study, they are**:** simple random sampling and stratified random sampling methods. The companies were randomly selected from 165 public listed companies; excluding financial institution because of the nature of its capital structure which is quite different from other institutions. The stratified random sampling method was applied (because these sectors have their distinct different characteristics which is unique) further in order to achieve normality in sampling distribution as suggested by Sekaran and Bougie (2009). Therefore, for every stratum (sector) simple random numbers were picked to represent each stratum. Fish and bowl method (Baxter & Babbie, 2004) was employed in determining which company to be included from each stratum (sector). However, there are circumstances where all the companies in a stratum are all eligible to be included in the sample. This circumstance also depends on the number (s) of companies in a stratum. The names of all the companies in each stratum were written on a sheet of paper with inscription of yes or no. Papers picked with yes inscription on were included in the sample. This method of sampling was chosen for this study because any company/companies picked from each stratum assumed to be

a representative of that stratum. At the end of the exercise, one hundred and seventeen companies were selected as a representative sample of the whole population. At the end, all the annual reports of these companies picked were checked to see if all the data needed for the study were present. Those without enough information were replaced with companies with full information needed for the study.

The sample for this study is drawn from the public listed companies in Nigeria because the study aimed at investigating the relationship between intellectual capital and companies' performance of Nigerian companies. The study chosen public listed companies is based on the fact that only public listed companies are mandatory to submit a copy of audited annual report to the Nigerian Stock Exchange; in other word data collection will be easy. These companies are grouped as sectors.

These sectors are made up of: agricultural and allied product companies; construction companies; emerging companies; engineering technological companies; health and clinical product companies; logistics and services; printing, publishing and packing companies; conglomerates; food and beverages; breweries and drinks; downstream and marketing of petroleum; industrial/domestic; chemical product; aviation and airline and automobile and tyre. These sectors were later re-grouped into eight (8) sectors for easy categorization and comparison. The new groups arrived at are: Agricultural/agro allied, health, downstream/marketing, logistics and services, information technology, communication and media (ICT), conglomerate, food and beverages and construction and manufacturing. Table 4.1 presents these eight sectors and sample drawn from them. Therefore, they are representative of the entire public listed companies in Nigeria except financial institution which is not covered by this

study. Sekaran and Bougies (2009) submit that study of a sample rather than the entire population is also sometimes likely to produce more reliable results.

Table 4.1
Sectors and Sample Size

Sector	**No of Companies (Population)**	**No Picked (Sample)**
Agric/agro allied	5	5
Health	10	10
Downstream/marketing	9	9
Logistic/services	38	28
ICT	35	21
Conglomerate	10	8
Food and beverage	20	15
Construction & manufacturing	38	21
Total	165	117

4.6 Determination of Sample Size

The decision about how large the sample size should be can be a very difficult task (Sekaran & Bougie, 2009) but the following factors affect decision on sample size: (1) the research objective; (2) the extent of precision desire (the confidence interval); (3) the acceptable risk in predicting the level of precision; (4) the amount of variability in the population itself; (5) the cost and time constraint; and (6) in some cases, the size of the population itself. In this study all these conditions were considered before arriving at the study's sample size.

To buttress the above submission, Schofield (1996, p49) argue that sample size is independent of size of the population; rather, more emphasis should be placed on the sample size which determines precision of the sample estimate rather than the size of the population. Germane to this argument, a rule of thumb says a sample size of 1,000 from a population of 100,000 might have the same error margin as a population of a million. In another view, Neuman (2007) argues that, one of the principles guiding sampling is: "the smaller the population, the bigger the sample ratio has to be for an accurate sample (p.171) and vice-versa". Thus, this condition is

applied to this study, the population of this study is 165 and the sample is 117; representing 71% of the total population. That means the sample size of this study is big and could be generalized.

Cavana et al. (2001); Barlett, Kotrilik and Higgins (2001); Isreal (1992) suggest the ratio of population to sample size as: 1000/300 or 30%, 10,000/1000 or 10%, above 150,000/1,500 or 1% while for large populations of over 10million, they advocate a sampling ratio of 2,500 or 0.025%. Hair et al. (2010) argue that the minimum ratio is 5:1; the desire level is between 15 to 20 observations for each independent variable(s). However, this study does not violate this rule, having 468 (117 x 4 years) observations. Whatever, be the case, there seems to be a consensus of opinion many scholars that the sample size for small sample should not be less than thirty cases for studies running a regression (Hair et al. 2010; Tabachnick & Fidell, 2007; Pallant, 2003).

According to Baxter and Babbie (2004), an appropriate sample size enables a researcher to generalize and establish the statistical significance of the research findings on the population of the study. However, the determination of appropriate sample size for this study was calculated using Yamane's formula (1973). Yamane (1973) sample size formula is stated as:

$$n = \frac{N}{1+N(e)^2}.$$

Where: n = required sample size; N = Population; and e = error margin, (0.05), 1 = unity (a constant); (Nwanmuo, 2008). It is worthy to note that the error margin/confidence interval for this study 5 at 95% confidence level. Thus, the result of application of this formula to determine the sample size of this study is:

$$n = \frac{165}{1+165(0.05)^2} = \frac{165}{1+0.4125} = 116.8$$

With this formula, the sample size for the population in this study is 116.8 or approximately 117. This calculated sample size conforms to the sample size tables suggested by Cavana et al. (2001); Barlett et al. (2001); and Isreal (1992) derived for different population at 95% confidence level; thus making the sample size to be adequate to represent the total population and to make inference. For visual inspection see appendix "A". Next to population and sampling is the research equation model for this study.

4.7 Research Model Development (Regression Model)

Research Model is developed in this study in order to describe the relationship between independent variable (s) (intellectual capital efficient) and dependent variable (s) (Company performance) to answer research question 3 in this study. The best way to do this is to express the independent variable (s) and dependent variable (s) using regression model (John, 2008), represented in an equation form. The research equation is arrived at based on regression model which is the best way to describe the relationship between independent variable (s) and dependent variable (John, 2008). This could be achieved using regression lines that stand for "best fit" represented by "X" and "Y" coordinates. "Y" denotes dependent variable while "X" denotes independent variable (s). The relationship is determined in term of predicting power of "Y" by "X". The relationship is given in mathematical equation as:

$Y = \alpha + \beta X$

Where:

Y = the predicted value of the dependent variable;

α = denotes the value of the Y intercept;

β = represents the regression coefficient defined by the gradient; and

X = denotes the value of the independent variable X.

In this study, the independent variables (IC) efficiency and dependent variables (company performance) are more than one each, therefore multiple regression are employed. Multiple regressions analysis provides a means of objectively assessing the degree and the character of relationship between the dependent variable and independent variables (Sekeran & Bougie, 2009) by applying the following mathematical equation which is applicable in this study.

$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3.....+ \beta nXn + V$

For this study multiple regression models were developed to examine the relationship between IC efficiency and company performance. Regression model is chosen because it allows prediction of company performance from a group of IC efficiencies (Tabachik & Fiddel, 2007). The predictive tendency of each independent variable (IC efficiency) is examined using the coefficient of the individual IC components. This is presented in both strength and direction and also the sign which indicate either positive or negative relationship. A coefficient value close to Zero signifies little effect on Y (Coakes & Ong, 2011; Hair et al. 2010; Pallant, 2003).

The parameter β is called regression coefficient, which indicates the relative importance of each of the independent variable (X) that is IC efficiency, in the prediction of the dependent variable (company performance) (Y). The amount of variation explained by the independent variable (IC) (X) is called the coefficient of determination or R^2. R^2 explains the percentage of variation explained by the IC efficiency. Based on this research theoretical framework, the regression models below were formed according to the research variables. In this study there are four dependent variables (company performance), three independent variables (IC) efficiencies (Human capital efficiency, structural capital efficiency and capital

employed efficiency), and three control variables (size, leverage, and sector); thus, we have four regression models in this study. For every dependent variable (company performance) a regression model was formed. Below are the four regression models used to analysis the relationship between IC efficiency and company performance to answer research question 3.

For the first dependent variable (Return on Equity) we have this equation:

$Y_{1it} = \alpha + \beta_1 X_1 HCEit + \beta_2 X_2 SCE_{it} + \beta_3 X_3 CEE_{it} + \beta_4 X_4 Size_{it} + \beta_5 X_5 LEV_{it} + \beta_6 X_6 Sec_{it} + V_{it}$.....(1)

Where Y_{1it} = Financial performance taken as Return on Equity (ROE).

$X_1 = HCE_{it}$ (human capital efficiency)

$X_2 = SCE_{it}$ (structural capital efficiency)

$X_3 = CEE_{it}$ (capital employed efficiency)

$X_4 = Size_{it}$ (natural logarithm of total asset) control variable 1

$X_5 = LEV_{it}$ (debt ratio to asset employed) control variable 2

$X_6 = Sec_{it}$ (Total IC assets) control variable 3

For the second dependent variable (Return on Asset); the regression model is as follows:

$Y_{2it} = \alpha + \beta_1 X_1 HCE_{it} + \beta_2 X_2 SCE_{it} + \beta_3 X_3 CEE_{it} + \beta_4 X_4 Size_{it} + \beta_5 X_5 LEV_{it} + \beta_6 X_6 Sec_{it} + V_{it}$.....(2)

Where Y_{2it} = Financial performance taken as Return on Asset (ROA).

$X_1 = HCE_{it}$ (human capital efficiency)

$X_2 = SCE_{it}$ (structural capital efficiency)

$X_3 = CEE_{it}$ (capital employed efficiency)

X_4 = $Size_{it}$ (Natural logarithm of total asset) control variable 1

X_5 = LEV_{it} (debt ratio to asset employed) control variable 2

X_6= Sec_{it} (Total IC assets) control variable 3

For the third dependent variable (Change in Sales); the regression model is as follows:

$$Y_{3it} = \alpha + \beta_1 X_1 HCE_{it} + \beta_2 X_2 SCE_{it} + \beta_3 X_3 CEE_{it} + \beta_4 X_4 Size_{it} + \beta_5 X_5 LEV_{it} + \beta_6 X_6 Sec_{it} + V_{it} \quad (3)$$

Where Y_{3it} = Financial performance taken as change in sales (CIS).

X_1 = HCE_{it} (human capital efficiency)

X_2 = SCE_{it} (structural capital efficiency)

X_3 = CEE_{it} (capital employed efficiency)

X_4 = $Size_{it}$ (natural logarithm of total asset) control variable 1

X_5 = LEV_{it} (debt ratio to asset employed) control variable 2

X_6= Sec_{it} (Total IC Assets) control variable 3.

For the fourth dependent variable (Market Value); the regression model is as follows:

$$Y_{it4} = \alpha + \beta_1 X_1 HCE_{it} + \beta_2 X_2 SCE_{it} + \beta_3 X_3 CEE_{it} + \beta_4 X_4 Size_{it} + \beta_5 X_5 LEV_{it} + \beta_6 X_6 Sec_{it} + V_{it} \quad (4)$$

Where Y_{it4} = Market performance taken as Market Value (MV).

X_1 = HCE_{it} (human capital efficiency)

X_2 = SCE_{it} (structural capital efficiency)

X_3 = CEE_{it} (capital employed efficiency)

X_4 = $Size_{it}$ (Natural logarithm of total asset) control variable 1

X_5 = LEV_{it} (debt ratio to asset employed) control variable 2

X_6= Sec_{it} (Total IC Assets).

For IC disclosure the descriptive statistics was used to assess the IC disclosure practice of the sampled companies, ICD practice of old and new companies and IC disclosure performance before and after the release of SAS 22 to answer research question 1, 2 and 4. The IC disclosure examined was based on Sveiby (1997) framework. Having through with the research equations for this study, the next section provides a discussion on research activities and research instrument for this study.

4.8 Research Activities

This section covers the research activities engaged by the researcher in order to complete this research work which includes; data source; data collection technique and data analysis. The details of the activities are discussed in subsection below.

4.8.1 Data Source

The annual reports of the sample companies were used to gather the necessary data needed for this study. The annual report presents financial statements of the sample companies in form of quantitative and qualitative information. The quantitative financial information covers the non-current asset, the income statement and some parts of the notes to the accounts. While the qualitative aspect outline chairman's report, directors' report and the significant companies' policies. In this research work, both the quantitative and qualitative information aspect of annual report were used to draw the necessary information needed for both IC efficiency and IC disclosure that are present in the annual reports. Maditinos et al. (2011), Abeysekera (2007) and Firer and Williams (2003) argue that annual report of a company is considered as appropriate tool for data collection in survey research because it reliable audited information.

4.8.2 Data Collection Procedure

Data for this study was collected through annual reports of the sample companies which are regarded as secondary source. A letter of introduction from Othman Yeop Abdullah Graduate School Universiti Utara Malaysia was given to the researcher after defended the research proposal on 18th July, 2011. Thus, the researcher obtained a necessary permission to carry out the necessary steps for the data collection from the sample companies. Going by the sample of this study which is 117, the collection of data from the sample companies could be fruitless or time consuming and tasking therefore, the researcher gathered the necessary data from the Nigerian Stock Exchange archive.

For smooth data collection procedure and to reduce the time frame, the researcher approached the Nigerian Stock Exchange having in mind that all the public listed companies in Nigeria must at least submit a copy of their annual reports to the Nigerian Stock Exchange. The researcher visited the Nigerian Stock Exchange (NSE) libraries in Abuja office being headquarter of the stock exchange in Nigeria and its branch office in Ilorin Kwara State. It took the researcher two months to gather the necessary information for the study.

The data collected includes data for dependent (company performance) and independent variables (IC). Empirical evidence suggests that annual report is preferred to other financial information channels because it is reliable and can easily be compared (Maditinos et al. 2011; Abeysekera, 2007; Firer and Williams, 2003). In addition, most companies release their annual reports within three to four months after the end of the accounting period, hence, the period of release with the period of data usage minimize time gap. Similar to this, is easy comparison since standard format is prescribed by GAAP to all listed companies (except financial institution

and the like) and is mandatory to be prepared on annual basis (Firer & Williams, 2003, 2005). The detail of the data collection procedure goes thus:

4.8.2.1 Data for IC Efficiency

For the IC efficiency data, figure for IC indicators such as salaries and wages, training and development cost, compensation cost, welfare and package cost, R&D, IT, advertising expenditures, and intellectual property (patent) were picked as they were in the annual reports of the sampled companies. Inclusion of compensation cost and welfare package as human capital value indicators was done following Skandia Navigator framework (Skandia Value Scheme, 1998) and IAS 38 revised as at 2004. Skandia Value Scheme (1998) classifies IC value indicators into three groups. They are: Customer/relational capital, organizational/structural capital and human capital. Under human capital, health is regarded as an indicator of value for human capital. Therefore, company employees' health investment is considered as intangible investment that can bring value (Skandia Value Scheme, 1998). Employee's health benefit is regarded as part of employee's welfare package benefit all over the countries, Nigeria inclusive.

More importantly, in Nigeria, it is mandated for both public and private companies to take care of their employees' health which is regarded as welfare. One of such package is National Insurance Health Scheme (NIHS) established by Federal Government of Nigeria. Under this scheme employers paid 90% of their employees' health bill. This is huge investment of which this study deems it fit to consider it as one of human capital value indicator. In addition, IAS 38 "intangible assets" as revised in 2004 termed any investment on employees benefit as asset arising from employee benefits which can include health investment and employees' compensation. In view of the above, this study considered compensation and welfare

package as human capital value indicators as resource based theory stipulated that all organization investments should be pooled together in assessing their values (Barney, 1991). The Skandia Value Scheme is presented in appendix B. However, content analysis was used to capture IC attributes in the annual reports of the sampled companies for IC disclosure data.

4.8.2.2 Data for IC Disclosure

Content analysis was used to capture IC information according to IC attributes by Sveiby (1997) framework from the sampled companies. The procedure is outlined below.

Content Analysis

Content analysis is a written document involving coding words, phrases, and sentences against a particular schemer of interest in order to derive quantitative scales of varying levels of complexity (Abeysekera, 2007: Abeysekera & Guthrie, 2005 & Guthrie & Petty, 2000). In accordance with Guthrie and Petty (2000) submission, content analysis involves the coding of the IC information attributes in the annual reports of companies to identify IC disclosure practice of such companies. In view of this, this study identified and classified the IC information disclosed in the annual reports of the sampled companies adopting the IC disclosure framework developed by Sveiby (1997), replicated and expanded by Guthrie, Petty, Ferrier and Wells (1999) and Guthrie and Petty (2000). This framework has been used by other scholars and researchers such as (Abdolmohammadi, 2005; Abeysekera, 2007; Abeysekera & Guthrie, 2005; Bozzolan, Favotto, & Ricceri, 2003, 2006; Biesso & Kumar, 2007; Brennan, 2001; Goh & Lim, 2004; Rahim et al. 2011). The coding technique uses 24 IC attributes across the three categories, structural capital (internal

capital), relational capital (external capital) and human capital; (See appendix B for visual inspection of Sveiby (1997) IC framework).

This study adopted this framework for IC disclosure because it has been used and tested in different countries and different companies. More importantly, it has been tested in a country similar in economy characteristic with Nigeria. Sveiby (1997) framework was used by Rahim et al. 2011 in Malaysia. Malaysia and Nigeria are developing countries with similar economic activities. To access and determine the IC disclosure practice of the sampled companies, all the 117 annual reports of the companies were assessed. This study uses the dichotomous technique; that is score of either one (1) or zero (0). One (1) is assigned if IC attribute was disclosed in the annual report, zero (0), if the IC attribute was not disclosed in the annual reports.

Krippendorff (1980) argues that content analysis is a research technique for making replicable and valid inference from data and Bowman (1984) proposes that it is a rich source of data because it may establish relationship which are otherwise difficult to reveal yet can be tested for validity but has it shortcoming. The shortcoming of content analysis is that it is subjective (Lin and Tang, 2009) lack precision and inferential strength (Oliveras, Gowthorpe, Kasperskaya & Perramon, 2008; Markoff, Shapiro & Weitman, 1975). In order to partially overcome this criticism, validation procedures are often adopted (Bowman, 1984) through reliability test.

(1) Reliability Test

Reliability can be established by computing the correlation between the same tests administered at two different time periods (Pallant, 2003). Testing the reliability of an instrument assists researcher to assess the extent to which items or scores are consistent in measuring the same construct. This test was conducted to validate and test how reliable is the scores arrived at after the content analysis procedure. Pallant

(2003) suggests procedure of conducting reliability test called test-re-test. This procedure is engaged to increase confidence that interpretation of written documents correspond to objective reality.

This is done by having more than one person read and code the written document (Bowman, 1984). Thus, this study adopts this method by engaging two research assistants to code and re-code the intellectual capital disclosure attributes in the annual reports of the sampled companies. Inter-rater reliability is of fundamental importance (Beattie, Mclnnes & Fearnley, 2004; Milnes & Adler, 1999). The following researchers have used this method in their studies: Branco, Delgado and Sousa, (2010); Oliveras et al. (2008); Abeysekera, (2007); Biesso and Kumar, (2007); Abdolmohammadi, (2005); Bukh, (2003); Brennan, 2001; Guthrie and Petty, (2000); and Bharadjwaj et al, (1999).

4.8.2.3 Data for Company Performance

Based on the literature, there are different proxies to measure company performance. These proxies include return on equity (Calisir et al. 2010; Cheng et. al, 2010; Shiu, 2006), Return on asset (Ahangar, 2011; Cheng et. al, 2010; Chen et al. 2005), market book value (Shiu, 2006; Calisir et al. 2010) growth in sales (Chen et al. 2005; Nazari, 2010), Tobin's Q (Wang and Chang, 2005; Chen et al. 2005), Earnings per share (EP) (Appuhami, 2007; Makki et al. 2009). This study measured company performance by return on equity, return on asset, change in sales (which the same as growth in sales), and market value as used by the above mentioned researchers.

4.8.3 Data Analysis Technique

For reliability in data analysis and hypotheses testing, this study makes use of several statistical techniques (Independent *t*-test and Mann Whitney U test for test of groups'

differences; Pearson correlation; and multiple regressions). Data collected were coded, entered and analysed in Statistical Package for Social Science (SPSS) version 16 for windows. The data for this study were subjected to different statistical tests to confirm their readiness for generalization, multivariate analysis, and hypotheses testing. Data must go through data screening before it can be analysed in order to have a reliable results (Hair et al. 2010; Coakes & Ong, 2011; Pallant, 2003). Few tests can be conducted to test the fitness of the data for analysis such as test for outliers, normality test, multicollinearity test, heteroscedasity test and reliability test. All these tests were conducted before proceeding to data analysis in this study.

4.8.3.1 Independent t-test

Independent sample *t*-test was employed to test for homoscedasticity between the three independent variables (human capital, structural capital, capital employed) control variables, (size, leverage and sector) and for the dependent variables (return on equity, return on assets, change in sales level and market value as well as to examine the groups differences in the intellectual capital disclosure practice of the sample companies "old" (traditional companies) and "new" (emerging companies) and also examining the performance of sample companies before and after the release of Statement of Accounting Standard (SAS) 22. This test was conducted to screen the data at the same time to answer research question 1, 2 and 4 and also to test for hypotheses 14 and 15 of this study.

4.8.3.2 Mann Whitney U Test

Mann Whitney U test was used for non-parametric test of two (2) independent samples. This test was conducted to examine intellectual capital disclosure of old" and "new" companies to complement and confirm the results of independent sample

t-test, so that the finding can be reliable and suitable for generalization. The test for differences conducted was performed to test the differences result arising from: (1) IC disclosure practices 'old' and 'new' companies; and (2) intellectual capital disclosure performance of sample companies 'before' and 'after' the release of SAS 22. Coakes & Ong, (2011) and Pallant, (2003) suggest that independent t-test is a good statistic tool to finding differences in the mean scores of two groups and also support the use of Mann Whitney U-test for non-parametric data.

4.8.3.3 Descriptive Statistics

Descriptive analyses were performed for IC efficiency and companies' performance and IC disclosure practice/performance using SPSS version 16 for windows. For IC efficiency and companies' performance ten (10) items headings were included: human capital efficiency (HCE), structural capital efficiency (SCE), capital employed efficiency (CEE), size, leverage, sector, return on equity (ROE), return on asset (ROA), change in sales (CIS) and market value (MV). Also descriptive statistics were run for IC disclosure categories (HCD, SCD and RCD), ICD practice for "old" and "new" companies and ICD performance "before" and "after" the release of SAS 22. For ICD practice/performance 24 IC attributes were used according to Sveiby, (1997). Next section is the statistical technique employed to describe the strength and the direction of the relationship between the variables.

4.8.3.4 Correlation Analysis

The researcher employed correlation analysis to assess the relationship that exist between human capital efficiency (HCE), structural capital efficiency (SCE), capital employed efficiency (CEE), size, leverage, sector, return on equity (ROE), return on asset (ROA), change in sales (CIS), and market value (MV) to test the

multicollinearity in the IC efficiency and company performance measures. And also the technique was used to test for the association among variables (IC efficiency company performance and control variables) in this study. This statistical tool was also used to test for multicollearity using Tolerance and Variance Inflated Factor (VIF). Pearson correlation matrix indicates the direction, strength and significance of the bivariate relationships among all the variables that were measured on ratio level (Sekaran and Bougie, 2009); while, O'Brien (2007) opines that existence of multi-collinearity affects the predictive power of the regression model.

4.8.3.5 Multiple Regression Analysis

For this study, multiple regression models were developed in an attempt to investigate the relationship that exists between the intellectual capital efficiency and companies' performance in order to answer research question 3 and also to examine the fitness of the model in relation to the study data. In addition, to justify the level of prediction and variance with which each of the IC efficiency explains the company performance variables. According to Hair et al. (2010) and Pallant (2003), the most fundamental search in multiple regressions is the extent to which the model fit the data, level of the significance, and autocorrelation problem. There are cut-off criteria to determine the fitness of the model. There have been series of considerations of determining criteria for the fitness of the model. One of which is R square (R^2) (Coakes & Ong, 2011; Hair et al. 2010; Pallant, 2003).

Though, there is no specified acceptable value for (R^2) that determines the fitness of the model, Latin, Douglas and Green (2003) advanced that there is no absolute standard for what constitute an acceptable fit, when dealing with social sciences data, but suggest values ranging from 0.1 and 0.5. For significance estimate, the p-value(s) such as 0.000; 0.01; 0.05 are used to determine the significance level in

regression model. Tabachnick and Fidell (2007) and Pallant (2003) argued that t-calculated should be compared with t-distribution table; t-calculated value greater than 1.96 or less than -1.96 are considered significant at alpha = 0.05, while t-calculated should be greater than 2.56 or less than -2.56 to be significant at alpha = 0.01 for a two tailed test. Dealing with autocorrelation, this study employed Durbin Watson is to check for autocorrelation in the regression model; Durbin Watson value near two (2) indicates no autocorrelation among the variables in the model (Pallant, 2003).

4.8.4 Unit of Analysis

Each individual company in the sample constitute the unit of analysis of this study. According to Gosling and Edwards (1995) each company as a unit of analysis can be easily identified and defined. Therefore, each individual company was assessed in accordance to its intellectual capital components coefficient in relation to company performance measures for IC efficiency and its IC disclosure performance was examined through the three IC categories (human capital disclosure, structural capital disclosure and relational capital) disclosed with company performance measures used in this study.

4.9 Operational Definitions of Study Variables

Zikmund, Babin, Carr, and Griffin (2010) describe operationalization as the process of identifying measure scales that correspond to variance in concept to be used in a research. Cavana et al. (2001) state that operational definition is a concept which specifies what each variable tries to measure by looking at the behavioural variables, facets or properties denoted by such concept. This is referring to as observed measurable elements in a study. By and large, operational definition is the detail of how the researcher measures the study variables. Therefore, the following are the operational definitions utilized in this research work.

4.9.1 Company Performance

In this study company performance was measured based on financial performance and market performance. Company performance is used in this study as dependent variables. The dependent variables are measured by four dimensions. These dimensions are; Return on equity (ROE), Return on Asset (ROA), Change in Sales (CIS), and Market Value for the purpose of determining the relationship between intellectual capital efficiencies and companies' performance. The two measures of company performance are explained below with their measurement variables. These variables are adopted from Calisir et al. (2011); Maditinos et al. (2011) and Shiu, 2006.

4.9.1.1 Financial Performance

Financial Performance was measured using Return on Assets (ROA), (Earnings before Interest and Taxes to Total Assets) and Return on Equity (ROE), (Earnings before Interest and Taxes to Total Equity), and Change in Sales (CIS) (revenue arising from sales). These variables are commonly used by researchers in the intellectual capital (Chen et al 2005; Nazari, 2010; Ting & Lean, 2009; Shiu, 2006; and Zeghal & Maaloul, 2010)

4.9.1.2 Market Performance

Market Performance is the second company performance measure used in this study. This measure was measured by market value (MV). Abdolmohamadi (2005) provides that market value is a function of total assets minus total liabilities. But this study measure market value as share price multiple by number of outstanding shares as used by Calisir et al. (2010) Maditinos et al. (2011); Shiu, (2007). MV is used as the Market performance (dependent variable), for the fourth regression model. It has

been used by many researchers to evaluate the contribution of IC efficiency on company performance. Some of the previous scholar that have used market value include; Abdolmohammadi, (2005); Calisir et al. (2011); Maditinos et al. (2011); Shiu, (2006). The measurements for the above variables can be viewed in Table 4.2.

4.10 Intellectual Capital

Intellectual Capital is used as independent variable in this study. Based on the previous studies, it comprises of human capital, structural capital and relational capital (Maditinos et al. 2011; Apphaumi, 2007; Shiu, 2006; Guthrie, 2001; Aboody & Lev, 1998; Skandia Value Scheme, 1998; Stewart, 1997; Sveiby, 1997; Edvinson & Malone, 1997). For this study, only human capital and structural capital were used to measure intellectual capital efficiency based on VAIC model of Pulic, (2000, and 2004). The previous researchers have evidence the appropriateness of this model in evaluating IC efficiency of companies.

4.10.1 Value Added Intellectual Coefficient (VAIC)

To determine the value efficiency of intellectual capital drivers/components, this research study makes used of Pulic (2000, 2004) framework called Value Added Intellectual Coefficient (VAIC) model. This model was employed to determine the value added (VA) of each components (Human capital and Structural capital) which is called IC efficiency. The VAIC must be calculated first to determine IC efficiency before assessing its contribution to company performance. Pulic (2000, 2004) VAIC is a composite sum of two indicators. These are: Capital Employed Efficiency (CEE) is an indicator of VA efficiency of capital employed, and Intellectual Capital Efficiency (ICE) which is an indicator of VA efficiency of company's intellectual capital resource. Intellectual capital efficiency is subdivided in to two. That is Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE). Therefore, VAIC^{TM} is calculated as:

$VAIC^{TM}$ = CEE + HCE + SCE.

$VAIC^{TM}$ = CEE + HCE + SCE.....(1)

Where:

HCE = Human Capital Efficiency

SCE = Structural Capital Efficiency

CEE = Capital Employed Efficiency

HCE = VA/HC .....(2)

VA = Value Added, which represents the value added created by a company.

The value of a company for this study is given below:

VA= OI + E + D + A where, OI = Operating Income, E = Employee Costs, D = Depreciation and A = Amortization.

Where:

OI = Operating Income,

E = Employee Costs,

D = Depreciation

A = Amortization

HC = Human Capital which is the total company investment on employee (salaries and wages, training and development cost, welfare package and compensation cost.

SCE = SC/VA .....(3)

Where:

SC = Structural Capital of a company represented as VA-HC. It is should be noted that structural capital value indicators are not always shown in the VAIC model but in the variable measurement (see Calisir et al. 2010; Nazari, 2010).

CEE = VA/CE.....(4)

Where:

CE = Book value of total net tangible assets.

This model have been used by several researchers such as Appuhami, 2007; Calisir, et al. 2010; Cheng, Hsiao, & Lin, 2010; Firer and Williams, 2005, 2003; Kavida and Sivakoumar, 2009; Shiu, 2006; Yalama and Coskun, 2007. This study makes use of this method following the submission of Makki et al. (2009). Makki et al. (2009) submit that there is need for more studies using VAIC method of valuing IC efficiency as the components of IC and the IC models have not yet been finalized, more studies on comprehensive and widely agreed VAIC are needed. These IC efficiencies were calculated in order to answer research question 3. Table 4.4 shows the measurement variables.

4.10.1.1 Human Capital Efficiency

Human capital efficiency is the value added by a company by the use of human resource investments (Pulic, 2000, 2004). Thus human capital efficiency (HCE) is calculated in accordance with the VAIC equation discussed above. For the purpose of this study, the researcher added compensation and welfare packages cost of the sampled companies to measure HC following IAS, 38 submissions on intangible investments of company on employees' benefits and in accordance with Skandia Value Scheme (1998).

Therefore, in view of the above submission and evidence, this study includes both welfare package and compensation as HC value indicators. In this study the following data were used to measure HC investment of the sampled companies: salaries and wage, training and development cost, compensation and welfare packages. They were used because the investment return of employees can be measure directly with company performance (Hussin & Salim, 2010; Nazari, 2010) and also they are company investments arising from employees' benefits (IAS, 38,

Skandia Value Scheme 1998). These HC value drivers were further explained in measurement of the variables.

4.10.1.2 Structural Capital Efficiency

Structural capital efficiency is the value added by the use of organization structure, data based, norm and processes in order to generate income (Edvinson & Malone, 1997; Pulic 2004). In order to calculate SCE, it is necessary to determine the value of firm's structural capital (SC). Pulic (1998) proposes a firm's total VA less its human capital is an appropriate proxy of a firm's SC, That is: SC= VA-HC. Based on prior research findings, Pulic (1998) argues that there is a proportionate relationship between Human Capital (HC) and SC in the value creation process attributable to the entire IC base. The less human capital participates in the value creation, the more structural capital is involved. Therefore, SCE for this study was calculated according to VAIC equation explained above.

It is important to note that, the indicators of Structural capital were not always included in VAIC model but in IC components measurement variables see for example (Calisir et al, 2010; Nazari 2010). This study adds patent as intellectual property to expand Pulic (2000, 2004) VAIC Model used to evaluate the structural capital efficiency of the sampled companies since it an output metric of organizational capital (R&D) following the submissions of Hall et al. (2005); Lanjouw et al. (1998) and Wyatt, (2008). Thus, Structural Capital is measured in this study by these indicators R&D investment, IT and advertising investment and intellectual property (patent).

4.10.1.3 Capital Employed Efficiency

In order to show the complete indicators of value in Pulic (2000, 2004) VAIC model, there is a need to show one important component that is not covered from the above intellectual capital components, called capital employed (CE). The component is Capital Employed (CE) by firm. Capital employed was taken as the book value of the total tangible assets. Pulic (2004) submits that to get a broad picture of efficiency of value creating resources of company the capital employed must not be left out. Therefore, CEE was calculated based on Public (2004, 2000) VAIC model discussed earlier in this session.

For IC disclosure, the three IC categories as developed by Sveiby (1997) and expanded by Guthrie et al.1999, and Guthrie and Petty (2000) were used. The three IC categories are: human capital, structural capital and relational capital. These capitals were subdivided in 24 attributes according to Sveiby (1997) IC disclosure framework. Sveiby (1997) framework can be viewed in appendix B.

4.11 Control Variables

The control variables used in this study are size of company, leverage, and sector as used by various researchers except sector for IC efficiency such as: Branco, Delgado and Sousa, 2010; Al-Twaijry, 2009; Oswald, 2007. Size and leverage are commonly control variables used in intellectual capital efficiency studies to reduce the effect that might arise because of individual company's distinct characteristics (Al-Twaijry, 2009; Riahi-Belkoaui, 2003). Sector is always used in intellectual capital disclosure (Al-Mamun, 2009). This study incorporates sector in IC efficiency and companies' performance regression model to evaluate the effect of sector. With reference to the prior studies, firm size is commonly measured as a proxy of total assets and leverage as total debt ratio (Abdolmohammadi, 2005; Al-Mamum, 2009; Vergauwen et al**,** 2005).

4.12 Measurement of Variables

Variables used in this study and their measurements are presented in the tables below. Table 4.2, 4.3 and 4.4 present this study variables and their measurement.

Table 4.2
Company Performance Variables; Control Variables and their Measurement

Variables	Measurements
ROE	Return on average equity is Earnings before Interest and Taxes to Total Equity).
ROA	Return on Assets is Earnings before Interest and Taxes to Total Assets
[5]Change in sales	Sales (Net) divided by the previous years' value of sales (Net) minus one.
Market Value	Share price multiple by number of outstanding shares
Control variables: Size	Total asset of the company, measured as (logarithm of total assets)
Leverage	Total debt ratio to equity
Sector	Total IC assets

Table 4.3
Intellectual Capital Disclosure Variables and Measurement

Variables	Measurement(s)
Human capital	Score (s) for attributes of human capital disclosed as in Sveiby (1997) framework
Structural capital	Score(s) for attributes of structural capital disclosed as in Sveiby (1997) framework
Relational capital	Score (s) for attributes of relational capital disclosed as in Sveiby (1997) framework

[5] Change in sales is the same thing as sales growth and has been used by Nazari (2010) and Al-Twaijry (2009).

Table 4.4
Intellectual Capital Efficiency, CE Variables and their Measurements

Variables	Measurement(s)
Human capital	Salaries and wages, training and development cost, welfare packages and compensation.
Structural capital	R&D represents all costs incurred during the year that relate to development of new products/services Cost of any IT material used in the company for the purpose of business (software and hardware) Patent value as it appear in annual reports Advertising Investments- all costs/expenditure incurred in relation to any form of advertising (billboard, television, radio and periodical) costs.
Capital employed	Book value of net tangible assets

4.13 Chapter Summary

This chapter explains how the research questions and research objectives were answered following series of research activities together with their justification. It covers data collection techniques, data analysis, operational definitions and variables measurements. The procedures for data analysis are outlined in the next chapter.

CHAPTER FIVE
DATA ANALYSIS

5.1 Introduction

The hypotheses developed to measure the relationship between independent variables (IC) and dependent variables (company performance) in this study were discussed in chapter two. The sample size selected from the population was also explained in chapter five. Essentially, this part focuses on the interpretation of results of the analyzed data for the test of the research hypotheses. Analyses were conducted using SPSS version 16 for test of normality, multicollinearity, homoscedasticity, descriptive analysis, reliability test and the relationship between intellectual capital and company performance. It is against this background that analysis of the data is presented under the following headings in this chapter - preliminary steps to inferential statistical analysis, common method of variance, inferential statistics and measurement of relationship, regression and summary.

5.2 Preliminary Steps in Inferential Statistical Analysis

In order not to violate the assumptions set for the application of multivariate analysis in research, the data in this study went through data exploration and screening. This is because, according to Sekaran and Bougie (2009) violation of multivariate analysis assumptions can result in committing type 1 or type 11 error which reduces the reliability of the research findings. The tests conduct for these assumptions in the current study included normality test (see Table 5.1, page 137), multicollinearity (see Table 5.2, page 138) and heteroscedasticity (Table 5.4, page 141).

5.2.1 Data Screening

Before analysing the data, the assumption of psychometric characteristic was confirmed. This study applied a series of data screening techniques such as identifying of outliers, treatment of missing values and test for normality assumption. These analyses are major pre-requisite for determining the choice of appropriate data

analysis technique (Coakes & Ong, 2011; Hair, Black, Babin, Anderson & Tatham, 2010; Pallant, 2003; Sekaran & Bougie, 2009).

5.2.1.1 Detection and Treatment of Outliers

Outliers are unusual observations present in a set of data with extreme values that differ from the rest of the data (Karioti, 2007). An outlier could be different from other points with respect to the value of variable or multivariate data, and could be unusual in respect of the combination of values of several variable s (Hair et al. 2010; Karioti & Caroni, 2002). It does not strongly influence the estimated slope of the regression line but could adversely affect the model fit and estimated error (Latin, Carrol & Green, 2003) and leads to wrong conclusion and inaccurate prediction (Karioti & Caroni, 2002). With obvious implication in the validity of the research findings when outliers present in a set of data, Hair et al. (2010) and Karioti and Caroni (2002) suggest detection and treatment of outliers at different levels.

Box plots were used in this study to detect outliers at univariate level while Mahalanobis distance was used to detect the multivariate outliers using exploratory descriptive method with SPSS 16 to prepare the data for analysis. After the inspection of the box plot for each of the variable it was revealed that the outliers found were not too far from all points and represented a sample from the selected samples which were representative of the whole population. Hence, the researcher left the data as it was and proceeded to the analysis following the caution from Hair et al. (2010). Hair et al., (2010) aver that researcher should take caution in the detection of any outliers because they can be representative of the population, 'unless proof indicates that they are not aberrant and not representative of any observation in the population'. The box plots for the seven variables are presented in the appendix "E" for visual inspection.

5.2.2 Normality Tests

It is necessary to test for normality of variables across two or more levels of another (Coakes and Ong, 2011; Pallant, 2003) in order to uphold the assumption of normality in respect of data distribution as one of the pre-requisite for multivariate analysis. Neglecting this aspect can lead to misleading association between the variables under investigation and hence distort the findings. One of the method in which normality of data can be measured is an assessment of data distribution through kurtosis and skewness (Sekaran & Bougie, 2009). Previous scholars assigned different acceptable values to kurtosis and skewness. Among these values are the values from (Kline, 2004; Tabanichnick & Fidell, 2007).

According to Tabanichnick and Fidell (2007) the value for kurtosis and skewness should not be greater than $\pm$ 2, Kline (2005) suggests $\pm$ 8 value for kurtosis and $\pm$ 2 for skewness. Value of Zero is assumed to be perfect for skewness which is unrealistic in social sciences research (Pallant, 2003). In this study all the variables fall within the acceptable values of kurtosis and skewness recommended by Tabanichnick and Fidell (2007). Therefore, the data for this study are fit to be analysed. Table 5.1 presents the normal distribution of all measured variables in this research study.

Table 5.1
Normality Test (Values of Skewness and Kurtosis of Measured Variables)

Variable	Skewness statistic	Standard error	Kurtosis statistic	Standard error
THCE	1.072	.224	.988	.444
TSCE	-.375	.224	.315	.444
TCEE	1.407	.224	2.081	.444
TSIZE	-.255	.224	-.103	.444
TLEV	1.895	.224	1.782	.444
TSEC	.152	.224	-.912	.444
TROE	.904	.224	.635	.444
TROA	1.316	.224	1.548	.444
TCIS	.855	.224	.255	.444
TMV	1.030	.224	.037	.444

Normal P-P plot and histogram were also used in this study to test for normality as suggested by some previous scholars. For example, Hair et al., (2010) delineate normal p-p plot and histogram as graphical representation of data distribution that enhance visual inspection at a glance. They therefore implored researchers to conduct normal p-p plot and histogram to assess the distribution of variables that are present in a data set for test of normality.

Hence, the normal p-p plot and histogram for the variables in this study were conducted showing the normality of the distribution of data for this study and showing the readiness of the data for further analyses. The normal P-P plot and histogram are presented in appendix “F and “G”.

5.2.3 Multicollinearity

This form of normality test of data distribution inspection focuses on the degree of the relationship that exists between independents variables (IC) and dependent variables (company performance). Multicollinearity exists in two ways; when there is correlation between dependent and independent variables on one hand, and inter-correlation between the independent variables is above 0.7 on the other hand (Coakes and Ong, 2011; Hair, et al., 2010; Pallant, 2003). Coakes and Ong (2011) reveal that

the existence of multicollinearity between variables distorts the predictive power of independent variables on dependent.

This study conducted the multicollinearity test between IC efficiency (ICE) components, control variables and company performance in order to check for the multicollinearity among the variables and to get the data prepare for further analyses. Table 5.2 shows the result of test of multicollinearity between the independent variables (IC) efficiency, as well as among independent variables (IC) efficiency, and control variables (size, leverage and sector) and dependent variables (company performance).

Table 5.2
Test for Multicollinearity

	THCE	TSCE	TCEE	TSIZE	TSEC	TROE	TM
				TLEV	TRO A	TCIS	V
ΤHC E							
	0.698*						
ΤSCE	*						
	0.477*	0.440*					
ΤCEE	*	*					
	0.196*	0.197*	0.031				
ΤSIZ E							
	0.035	0.183*	-0.117	-0.132			
ΤLEV							

ΓSEC	0.384**	0.657**	0.342**	0.262**	0.185				
	0.706**	0.506**	0.212**	-0.040	0.068	0.508**			
ΓRO E									
	0.551**	0.380**		-0.008	-0.14				
ΓRO A			0.289**			0.460**	0.363**		
TCIS	0.233**	0.076	0.099	-0.059					
					0.220**	0.284**	0.253**	0.241**	
TMV	0.334**	0.202**	0.085	-0.620	0.970	0.262**	0.198**	0.236**	0.132

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

Tolerance and Variance Inflation Factor (VIF) are both widely used measures of the degree of multicollinearity among the variables under study (O'Brien, 2007). Tolerance is a measure of collinearity reported by most statistical program showing the value of 'variability of the selected independent variables that is not explained by other independent variables' (Hair, et al., 2010: 201). A small tolerance value indicates that the variable under consideration is almost a perfect linear combination of the independent variables. O'Brien (2007) submits that, a tolerance value less than 0.1 should be investigated further. The tolerance value can be calculated using this

formula: 1-R^2 (Coakes & Ong, 2011: Hair, et al., 2010; O'Brien, 2007; Pallant, 2003). While Variance Inflation Factor (VIF) shows the degree to which the standard error has been inflated by collinearity, VIF measures the impact of collinearity among the variables in a regression model (www.researchconsultation.com/multicollinearity_regression_spss_collinearity_diagnosis_vif.asp; O'Brien, 2007). The formula for VIF is 1/Tolerance and it is always greater than 1. There is no specific limit value for VIF, but scholars suggest maximum of 10 (O'Brien, 2007). Multicollinearity exists when there is a low tolerance value and high value of VIF.

In this study, the researcher adopts the minimum value of 0.10 and value of 10 for VIF as suggested by Hair, et al., 2010; O'Brien, 2007). Variable with value less than 0.10 is assumed to have multicollinearity problem in this study. Table 5.3 below reveals the multicollinearity test conducted for IC efficiency and company performance. The variables used in this study can be said to be free from multicollinearity problem using 0.1 and 10 values for tolerance and VIF as benchmark. Thus, the data for this study could be said to be adequate for further analyses needed to answer all research questions.

Table 5.3
Test for Multicollinearity for the Four Years of Analysis

Dependent Variables	Independent Variable	Collinearity	Collinearity
		Tolerance	VIF
ROE 2007	CEE	.589	1.697
ROE 2008	SIZE	.696	1.004
ROE 2009	LEV	.552	1.042
ROE 2010	SEC	.574	1.110
ROA 2008	SIZE	.640	1.064
ROA 2009	LEV	.559	1.056
ROA 2010	SEC	.404	1.003
CIS 2007	CEE	.560	1.221
CIS 2008	SIZE	.616	1.092
CIS 2009	LEV	.684	1.068
CIS 2010	SEC	.515	1.153
MV 2007	CEE	.453	1.526
MV 2008	SIZE	.421	1.021
MV 2009	LEV	.402	1.007
MV 2010	SEC	.574	1.110

5.2.4 Assumption of Homoscedasticity

Going by the assumptions of multivariate analysis, test for homoscedasticity must be carried out. This test was conducted with the assumption that the level of variance in the company performance explained is equally distributed among the intellectual capital efficiency (ICE). If otherwise, the research data would be said to be heteroscedastic (Hair, et al. 2010). This test is statistically conducted in this study through independent sample *t*-test. Scholars such as Hair, et al. (2010); Pallant, (2003) argue that the Levene statistics result should be statistically insignificant (α>0.05) for the data to be outside the range of heteroscedasticity. In line with the above submission, this study appeared to be freed from the problem of heteroscedasticity going by the result presented in Table 5.4.

The result of Levene statistics of each of the company performance computed against intellectual capital (IC) efficiency data are insignificant, thus suggesting that variance in the company performance is equally spread across the intellectual capital (IC) efficiency in all the sectors examined in this study. The absence of multiple cases of heteroscedasticity in this data set indicates that the data is fit to run multivariate analysis.

Table 5.4
Test for Homoscedasticity

Test of Homogeneity of Variances				
	Levene Statistic	df1	df2	Sig.
THCE	1.891	6	110	0.089
TSCE	1.642	6	110	0.231
TCEE	1.937	6	110	0.541
TSIZE	1.570	6	110	0.262
TLEV	1.864	6	110	0.360
TSEC	1.738	6	110	0.095
TROE	1.379	6	110	0.229
TROA	1.096	6	110	0.369
TCIS	1.843	6	110	0.452
TMV	1.438	6	110	0.135

5.2.5 Assumption of Linearity

Before multivariate analysis can be run there is the need to test for linearity between dependent and independent variables (Coakes & Ong, 2011; Pallant, 2003). To comply with this assumption, this study examines the linearity between IC efficiency and company performance by using histogram and normal probability plots from regression standardized residual results as suggested by Coakes and Ong, (2011). Coakes and Ong, (2011) argue that the linearity relationship between independent variables and dependent variables can be assessed by using a graphic inspection of normal probability plots of regression standardized residual and histogram. The histograms in this study reveal that the data is relatively normal, while the normal probability further confirms the positive linear correlation between the study variables (IC efficiency and company performance measures). The histogram can be

seen in appendix “G” while the normal probability plots of regression standardized residual can be seen in appendix “F”. Both histogram and normal probability plots show that the data is fit for further analyses.

In summary, all the above discussed tests were conducted to screen the study’s data, to check for multicollinearity between the variables (IC) efficiency and company performance and to comply with the assumption of regression analysis. The screening generally indicates that the data is adequately fit for further analyses.

5.3 Common Method of Variance

According to Nunnally and Berstein, (1994) measurement errors arise from common method bias and these can have negative impact on the observed relationship between measured variables. It is necessary to guide against common method bias in studies involving same respondents to both independent and dependent measurement items. To investigate the variability in items, Cooper and Schindler (2000) suggest items with standard deviation of 1.0 and above as having adequate variability for inclusion in the analysis. All the 10 items in this study have standard deviation ranging from 1.020 to 1.710. Therefore, all the items in this study are adequate for further analyses.

5.4 Sample Profile and Descriptive Statistics

This section presents sample profile which is the composition of the sectors used in this study and the overall percentage. Also presented are the descriptive statistics of this study.

5.4.1 Sample Profile

Table 5.5 shows the sample composition of sectors used in this study. The sample cut across the industry groups making up the Nigerian economy except the financial institutions. Thus, they are representative of the population of this study. The majority of the samples come from logistic/services sectors in which 28 companies representing 24.7% were picked, 21 companies representing 17.9% were picked from ICT, and 21 companies represent 17.9% were picked from

construction/manufacturing. 5 companies representing 4% of the sampled companies were from Agric/agro-allied sector. The remaining sampled companies were from Health sector, 10 companies (8.5%), food and beverages, 15 companies (13%), downstream/marketing of petroleum, 9 companies representing 7.69%, and conglomerate, 8 companies representing 6.8%.

Table 5.5
Sample Composition Numbers and Percentage (%)

Sector	No of companies	Percentage (%)
Logistic/service	28	23.9
ICT	21	17.9
Construction/manufacturing	21	17.9
Food and beverages	15	13.0
Health	10	8.54
Downstream/marketing of petrol	9	7.69
Conglomerate	8	6.80
Agric/agro-allied	5	4.27
Total	117	100

5.4.2 Descriptive Statistics Analysis of Variables

The descriptive statistics for intellectual capital efficiency variables, control variables and company performance variables of this study showing inferences from all the variables are reported in Tables 5.6a-b. The Tables revealed the values of the mean, minimum, maximum and standard deviation. Return on equity, return on asset, change in sales and market value represent the dependent variables; while human capital efficiency, structural capital efficiency, and capital employed are indicators of value added efficiencies of intellectual capital and physical capital. Also, size, leverage and sector are control variables for four years of observations (2007-2010).

Table 5.6 (a)

*Descriptive Statistics of Observed Variables (IC efficiency, Control and Company Performanc*e

Variables	2007				2008			
	Min	Max	Mean	SD	Min	Max	Mean	SD
HCE	1.00	7.41	1.45	0.96	2.43	2.87	8.95	5.38
SCE	0.00	0.86	0.25	0.16	0.57	0.96	0.84	0.10
CEE	0.05	1.18	0.21	0.18	0.20	0.21	0.05	0.04
SIZE	0.14	0.51	0.14	0.01	1.59	3.67	0.78	0.55
LEV	0.01	2.81	0.55	0.63	0.12	7.36	1.69	1.86
SEC	0.94	2.75	0.81	0.42	0.50	0.12	0.03	0.01
ROE	0.04	5.69	1.09	1.43	5.68	9.36	1.21	3.14
ROA	0.52	4.93	3.49	2.88	0.43	3.06	2.65	1.37
CIS	0.83	2.49	0.61	0.34	0.96	8.46	1.77	1.15
MV	3.38	4.05	1.01	2.13	4.27	2.08	1.56	1.49
n= 117								

Table 5.6 (b)

Descriptive Statistics of Observed Variables (IC efficiency, Control and Company Performance

Variables	2009				2010			
	Min	Max	Mean	SD	Min	Max	Mean	SD
HCE	0.20	5.23	2.91	2.55	4.00	28.23	10.19	1.59
SCE	0.08	3.31	0.88	0.56	4.52	29.35	5.87	1.31
CEE	0.02	6.74	1.06	1.04	4.07	31.03	7.33	1.67
SIZE	4.00	6.89	5.39	0.75	3.69	16.11	13.10	1.10
LEV	0.05	7.59	1.24	1.12	0.01	5.797	1.37	1.47
SEC	2.23	6.33	6.75	4.91	4.34	33.42	9.80	1.63

ROE	0.20	8.32	2.49	4.61	29.21	9.40
	1.57			1.71		
ROA	4.36	5.31	1.12	4.13	30.00	11.33
	2.33			1.02		
CIS	0.11	6.87	1.52	4.10	28.20	6.43
	1.02			1.61		
MV	3.20	4.50	3.69	4.57	28.62	4.62
	4.85			1.57		
n= 117						

Note: The figures are in billion Nigerian currency ₦[6]

HCE shows the ratio of how much value added has been created by employees; SCE indicates the contribution of structural capital in value creation; and CEE presents companies' financial and physical capital employed ratio efficiency in creating value. The descriptive results indicate that the mean value of HCE shows that the sampled companies' human capital is more effective in creating value than structural capital and capital employed throughout the four years of observations. The result revealed further the efficient utilization of assets (measure as size) as the mean value increased tremendously from 0.14 (in 2007) to 13.10 (in 2010). So also sector (measured as total IC) is maximally utilized as its mean value increased from 0.81 (in 2007) to 9.80 (in 2010). Finally, the company performance measures ROE, ROA, CIS and MV are sound as their mean values improved on yearly basis.

In addition to descriptive statistics above Table 5.7 presents the performances of companies in relation to value added intellectual capital efficiencies (VAIC) values. Among the three VAIC indicators, human capital has the highest performance by all the sampled companies. These companies have relatively higher human capital efficiency (HCE) than structural capital efficiency (SCE) and capital employed (CEE) from 2007 to 2010. Among the sampled companies Chemical and Allied tops the list with intellectual capital efficiency (ICE) of 15.25 (HCE), 3.31 (SCE)

[6] Naira (₦) is 162 to 1 USD $

followed by Fidson 14.24 (HCE), 1.98 (SCE). Chemical and Allied is also the best performer in term of capital employed efficiency with 6.75. This result is consistent with Maditinos et al. (2011) and Calisir et al. (2010) supporting the value creation potentiality of IC as argued by RBV and ICV theories upon which this study is based.

With VAIC ranking, Chemical and Allied has the highest efficiency ranking with VAIC of 25.31, followed by Fidson (VAIC of 21.60), M-tech communication (VAIC of 18.49), IPWA (VAIC of 17.1), NCR (VAIC of 15.72) and Okomu oil (VAIC of 15.67). This implies that, these five companies used the IC resources efficiently in 2010. On the other hand, Vono, W.A aluminium, Wiggin Teape, Total, United, Udeofson and Aluminium have the least efficiency with less than 1 VAIC.

Table 5.7
Intellectual Capital Efficiency Performance of Sample Companies Using VAIC

Companies	**HCE**	**SCE**	**CEE**	**VAIC**	**Ranking**
Chemical & Allied	15.2471	3.3125	6.7487	25.3083	1
Fidson	14.2391	1.9784	5.3824	21.5999	2
M-tech communication	11.7789	1.9070	4.8012	18.4871	3
IPWA	10.6653	1.9040	4.5313	17.1006	4
NCR	10.1186	1.9010	3.7020	15.7216	5
Okomu oil	10.1106	1.8953	3.6682	15.6741	6
NGC	9.6380	1.8462	3.3903	14.9236	7
NAHCO	9.2021	1.6341	3.3003	14.1365	8
Briscoe	9.2011	1.4452	2.5632	12.8795	9
Tripple	8.5368	1.4423	2.5512	12.5303	10
Roads	8.2364	1.3553	2.3904	11.9821	11
Grief	7.0592	1.3433	2.3554	10.7579	12
Ashaka Cement	6.5223	1.2633	2.2503	10.0359	13
Smart	6.4407	1.2449	2.1673	9.8529	14
Wiggin Teape	6.3066	1.2308	1.9770	9.3984	15
Seven-Up	5.6275	1.2205	1.9760	8.8490	16

Table 5.7 (Continued)
Intellectual Capital Efficiency Performance of Sampled Companies using VAIC

Companies	HCE	SCE	CEE	VAIC	RANKING
Red Star	5.6275	1.2129	1.8804	8.5288	17
Juli	5.4079	1.2077	1.7830	8.1596	19
Conveilli	5.2433	1.2065	1.7809	7.8617	20
Thomas Wyatt	5.2403	1.2054	1.7508	7.8615	21
Unilever	5.1848	1.2052	1.7231	7.5721	22
Berger Paint	5.0420	1.2030	1.7020	7.5720	23
Cadbury	4.9057	1.2008	1.6903	7.4778	24
Ploy Product	4.7515	1.2006	1.6903	7.0994	25
Aboseldehyde lab	4.2208	1.1580	1.6422	7.0990	26
Beta Glass	4.2206	1.1213	1.6137	6.8576	27
Cement Co. of North	4.1207	1.1213	1.5545	6.8574	28
Inter-linked- Tech	3.9086	1.0901	1.5437	6.6307	29
Unifoam	3.7005	1.0852	1.5437	6.5375	30
Chams	3.6497	1.0076	1.3902	6.4644	31
Chellarams	3.6497	1.0076	1.3902	5.8591	32
Pharma-Deko	3.4999	0.9935	1.3860	5.6616	33
Conoil	3.4965	0.9789	1.3638	5.5446	34
Morison	3.3930	0.9614	1.3570	5.4985	35
First Aluminium Nigeria	3.3550	0.9343	1.3211	5.2311	36
W. A aluminium	3.2565	0.9343	1.2956	5.1889	37
Premier Paints	3.2410	0.9284	1.2476	5.1660	38
Nigerian Wire & Cable	3.2180	0.9151	1.2448	5.1159	39
Evans Medical	3.1669	0.9062	1.2166	5.1136	40
Nigerian Ropes	3.0671	0.9011	1.2090	5.1132	41
Cutix	3.0421	0.9011	1.1597	4.9361	42
Okitipupa Palm	3.0090	0.8960	1.1220	4.9360	43
Dangote Cement	2.9452	0.8913	1.1222	4.9209	44
Dangote Flour Mills	2.8473	0.8913	1.1136	4.8485	45

Table 5.7 (Continued)
Intellectual Capital Efficiency Performance of Sampled Companies using VAIC

Companies	**HCE**	**SCE**	**CEE**	**VAIC**	**Rank**
B. O. C Gases	1.5468	0.5816	0.4201	3.1696	80
Livestock Feeds	1.5398	0.5604	0.3871	3.1185	82
Capital oil	1.5205	0.5479	0.384	3.0444	83
May & Baker	1.5178	0.5386	0.3686	3.0068	84
UAC	1.4825	0.5336	0.3686	3.0068	85
Multitex	1.4538	0.4947	0.3684	2.9834	86
NBC	1.4344	0.4637	0.3548	2.9645	87
Chevron Oil	1.4344	0.4557	0.3320	2.8070	88
NSCN	1.4282	0.4528	0.3320	2.8023	89
Incar Nigeria	1.3925	0.4286	0.3290	2.8023	90
Neimeth	1.3855	0.4286	0.3175	2.7638	91
Foremost Diaries	1.3855	0.4274	0.3115	2.7384	92
Nestle	1.3747	0.4273	0.3115	2.6754	93
Golden Guinea	1.3727	0.4236	0.3029	2.5849	94
Longman	1.3265	0.4188	0.2984	2.5426	95
Honey flour	1.3196	0.3842	0.2919	2.486	96
NB	1.3056	0.3751	0.2816	2.3925	97
Omatex	1.2596	0.3535	0.2649	2.3909	98
African paints	1.2419	0.3506	0.2578	2.3178	99
Jos Intern.	1.2312	0.3159	0.2464	2.1369	100
Nigerian Wire & Cable	1.2312	0.3121	0.2427	2.1058	101
W. A Aluminium	1.1269	0.3087	0.2379	2.1058	102
Nigeria Enamelware Co.	1.0745	0.3028	0.2270	1.6043	103
Prestige	1.0124	0.3028	0.2049	1.5201	104
Rak Unity Petroleum	0.9205	0.2854	0.1997	1.4056	105
Nigerian Sew Machine	0.8635	0.2852	0.1973	1.3460	106
PZ Cusson	0.8067	0.2818	0.1972	1.2857	107
Stokvis Nigeria	0.7599	0.2782	0.1916	1.2297	108
Tropical	0.6089	0.2780	0.1912	1.0781	109
UDSN	0.5806	0.2726	0.1719	1.0251	110
Vono	0.5550	0.2653	0.1717	0.9920	111
W. A Glass Industries	0.5388	0.2648	0.1620	0.9656	112
Wiggin Teape Nig.	0.5243	0.2556	0.1061	0.8860	113
Total	0.4436	0.2396	0.1059	0.7891	114
United Nig.	0.3679	0.1231	0.1057	0.5967	115
Udeofson garment	0.3258	0.1126	0.0614	0.4998	116
Aluminium Extrusion	0.2084	0.0862	0.0246	0.3192	117
Average	3.0714	0.8893	1.0076	5.6671	

For further clarification of VAIC of the sampled companies see appendix "H" "I" and "J" for the remaining years (2007, 2008 and 2009), VAIC performance of the sampled companies for visual inspection. The next Table 5.7 (b) presents the average IC efficiency performance of individual intellectual capital components value added of the sampled companies from 2007 to 2010.

Table 5.7(b)
VAIC Performance of Sampled Companies for 2007-2010

Year	HCE	SCE	CEE	VAIC
2007	3.13	0.59	1.09	4.81
2008	3.27	0.53	0.93	4.73
2009	3.30	0.87	1.11	5.28
2010	3.07	0.89	1.08	5.04
Average	3.19	0.72	1.05	4.96

The result in Table 5.7(b) indicates that total efficiency of the sampled companies specifically from Cutix to Aluminium Extrusion in Nigeria is below the average (4.96) of 2007-2010. This situation provides evidence that there are redundant resources in these companies that have not been efficiently utilized (Ting and Lean, 2009). The result also suggests that the value creation efficiency of the sampled companies lie strongly on HCE. This result is consistent with Calisir et al. (2010); Maditinos et al. (2011); and Ting and Lean (2009). This means that human capital resources are more efficiently used by the sampled companies than structural capital resources thus, supporting the intellectual capital view theory.

Next is the Pearson correlation conducted between all the variables to establish the pair wise relationships and the direction of the relationships between the independent variables (IC efficiency) and the dependent variables (company performance). With Pearson correlation coefficient, there is easiness of identifying the direction and strength (positive or negative) of the relationship between the two variables (IC efficiency, control variables and company performance). This test was conducted to

check the direction of the relationship between IC efficiencies and company performance to answer research 3 and to test for hypotheses 1 to 8 of this study.

5.5 Testing Association between Intellectual Capital Efficiency and Company Performance

Correlation analyses were conducted to test for the association that exist between the pair of all variables under study in order to answer the study's research questions and test for the stated hypotheses of the research. Table 5.8 shows the relationship among the independent variables (IC) efficiency, dependent variables (company performance) and control variables (size, leverage and sector).

The correlation results of this study revealed that the three components of VAIC used in this study to measure IC efficiency and capital employed are statistically significant ($p<0.05$), pointing to the fact that there is no collinearity among the variables under study and supporting the IC literature that stresses the connectivity of the IC components (Sulllivan, 1998). The Pearson correlation (r) between HCE and SCE; HCE and CEE; HCE and ROE; HCE and ROA; and HCE and CIS; HCE and MV are statistically significant at $r = 0.698$, ($p<0.05$), $r = 0.477$, ($p<0.05$), $r = 0.706$, ($p<0.05$), $r = 0.44$, ($p<0.05$), and $r = 0.551$, ($p<0.05$), $r = 0.233$, ($p<0.05$), $r = 0.334$. A strong correlation exists between HCE and ROE ($r = 0.706$, $p<0.05$). Likewise there is a correlation between SCE and company performance measures except for CIS. The results also show SCE has a strong correlation with sector with $r = 0.657$, ($p<0.05$).

The Table 5.8 further shows the detail of all the variables correlation among each other. To further confirm this, Durbin Watson test was conducted with regression. Durbin Watson value should be close to 2. The result of Durbin Watson in this study

ranges from 1.59 to 2.214, therefore, suggesting absence of non-autocorrelation among the variables.

Table 5.8
Correlation between the Variables (Independent, Control and Dependent)

	THCE	TSCE	TCEE	TSIZE	TLEV	TSEC	TROE	TROA	TCIS	TMV
THCE										
TSCE	0.698**									
TCEE	0.477**	0.440**								
TSIZE	0.196**	0.197**	0.031							
TLEV	0.035	0.183**	-0.117	-0.132						
TSEC	0.384**	0.657**	0.342**	0.262**	0.185**					
TROE	0.706**	0.506**	0.212**	-0.040	0.068	0.508**				
TROA	0.551**	0.380**	0.289**	-0.008	-0.140**	0.460**	0.363**			

A							*		
TCIS	0.233*	0.076	0.099	-0.059				0.241*	
					0.220*	0.284**	0.253**		
TMV		0.202*	0.085	-0.620	0.970			0.236*	0.132
	0.334**					0.262**	0.198*		

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

Next to correlation is the data analysis technique which is made up of the independent *t*-test and Mann-Whitney U test to investigate the existence of differences between groups of the sampled companies and multiple regressions.

5.6 Data Analysis

The following are the data analysis techniques used in this study to answer the research questions. These data analysis technique include descriptive statistics to answer research question 1, 2 and 4; independent *t*-test to answer research 2, and 4. Mann-Whitney U test was employed to answer research question 2; and multiple regressions to answer research question 3.

5.6.1 Intellectual Capital Disclosure Level (Descriptive Statistics)

This section provides the IC disclosure practice of the sampled companies to answer the research question 1 and to test for the hypothesis 13 - There is difference between IC disclosure categories of the sampled companies. And also to differentiate between the IC disclosures practice of 'old' and 'new' companies using independent *t*-test and Mann-Whitney U Test. These tests were conducted to examine the mean scores of two difference groups (old and new) companies to answer the research question 2 and 4 and to test for hypothesis 14 and 15. The traditional companies in the sample were

tagged ‘old’ company while the emerging companies were tagged ‘new’ (Abdolmohammad, 2005).

Table 5.9 (a-c) presents descriptive statistics showing the mean and standard deviation of IC disclosure categories of the sampled companies over 4 years of observations. Starting from ICD categories (HCD, SCD, and RCD results, followed by grouped difference (old and new) ICD and before and after release of SAS 22.

Table 5.9 (a)
Mean and Standard Deviation of Human Capital Disclosure

Item	2004 Mean	2004 SD	2005 Mean	2005 SD	2007 Mean	2007 SD	2008 Mean	2008 SD
Know-how	0.86	0.34	0.88	0.32	0.88	0.32	0.86	0.34
Education	0.87	0.33	0.88	0.31	0.90	0.29	0.91	0.28
Voc.qfn	0.65	0.47	0.66	0.47	0.70	0.45	0.72	0.44
Work-rel.kn	0.75	0.43	0.76	0.42	0.77	0.41	0.76	0.42
Workrel.competence	0.76	0.42	0.77	0.41	0.76	0.42	0.76	0.42
Entrep.spirit	0.84	0.36	0.85	0.35	0.86	0.34	0.87	0.33
HCD SCORE	4.75	0.47	4.80	0.45	4.89	0.45	4.90	0.45

Table 5.9 (b)
Mean and Standard Deviation of Structural Capital Disclosure

Item	2004 Mean	2004 SD	2005 Mean	2005 SD	2007 Mean	2007 SD	2008 Mean	2008 SD
Patents	0.82	0.38	0.86	0.34	0.87	0.33	0.88	0.31
Copyrights	0.28	0.45	0.28	0.45	0.30	0.46	0.32	0.47
Trademarks	0.29	0.45	0.30	0.46	0.34	0.47	0.35	0.47
Mgt. Phil.	0.21	0.41	0.23	0.42	0.27	0.44	0.28	0.45
Mgt. process	0.37	0.48	0.40	0.49	0.41	0.49	0.42	0.49
Corp-culture	0.23	0.42	0.26	0.44	0.28	0.45	0.29	0.45
Inf. system	0.41	0.49	0.43	0.49	0.45	0.49	0.47	0.50
Networking	0.17	0.38	0.19	0.39	0.21	0.41	0.23	0.42
Fin.Relation	0.37	0.48	0.41	0.49	0.43	0.49	0.45	0.49
SCD SCORE	3.18	0.44	3.41	0.45	3.58	0.45	3.73	0.46

Table 5.9 (c)
Mean and Standard Deviation of Relational Capital Disclosure

Item	2004 Mean	2004 SD	2005 Mean	2005 SD	2007 Mean	2007 SD	2008 Mean	2008 SD
Brands	0.42	0.49	0.44	0.49	0.45	0.49	0.47	0.50
Customer	0.44	0.49	0.46	0.50	0.47	0.50	0.52	0.50
Cus. loyalty	0.58	0.49	0.58	0.49	0.59	0.49	0.64	0.48
Company name	0.68	0.45	0.70	0.46	0.71	0.45	0.73	0.44
Dist. channels	0.46	0.50	0.47	0.50	0.48	0.50	0.47	0.50
Bus.collaboration	0.41	0.49	0.43	0.49	0.45	0.49	0.50	0.50
Licensing	0.58	0.49	0.58	0.49	0.60	0.49	0.63	0.48
Fav-contracts	0.42	0.49	0.43	0.49	0.45	0.49	0.47	0.50
Franchising	0.55	0.49	0.56	0.49	0.58	0.49	0.61	0.48
RCD SCORE	4.58	0.49	4.68	0.49	4.83	0.49	5.08	0.49

Based on the intellectual capital categories, the sampled companies disclosed, human capital disclosures are more than the two other IC categories (SC and RC) in the first three years (2004, 2005 and 2007) representing 37.96%, 32.23% and 36.77% of the overall ICD for the three years. However, relational capital takes the lead in 2008 in term of disclosure with 37.05% of the overall ICD. On the hand, structural capital is the least disclosed out of the three IC categories. Table 5.10 presents the overall ICD based on IC categories for the four years of the study.

Table 5.10
Mean and Standard Deviation of Intellectual Capital Disclosure Practice of the Sampled Companies

Variable	2004 Mean	2004 SD	2005 Mean	2005 SD	2007 Mean	2007 SD	2008 Mean	2008 SD
HCD	4.75	0.47	4.80	0.45	4.89	0.45	4.90	0.45
SCD	3.18	0.44	3.41	0.45	3.58	0.45	3.73	0.46
RCD	4.58	0.49	4.68	0.49	4.83	0.49	5.08	0.49
ICD	12.51	1.40	12.89	1.39	13.30	1.39	13.71	1.40

Table 5.10 shows the descriptive statistics of the intellectual capital disclosure (ICD) practice of the sampled companies. ICD is total of human capital disclosure (HCD),

structural capital disclosure (SCD) and relational capital disclosure (RCD). The mean scores of ICD are 12.51, 12.89, 13.30 and 13.71 for 2004 to 2008 respectively. It can be deduced from the result that out of 5 items (attributes) under human capital (HC) 4.75, 4.8, 4.89 and 4.90 items were disclosed on average by the sampled companies based on 2004, 2005, 2007 and 2008 years of observations. For structural capital (SC) out of 9 items, 3.18, 3.41, 3.58 and 3.73 items were disclosed for 2004 to 2008. The last IC category- relational capital, out of 9 items, 4.58, 4.68, 4.83 and 5.08 represent the numbers of RC disclosed for 2004 to 2008 by the sampled companies.

5.6.1.1 Independent t-test Showing Intellectual Capital Disclosure Level

The independent *t*-test was conducted to examine whether the companies' characteristics will affect their intellectual capital disclosure for the year 2008. This test was conducted to answer research question 2, and test for hypothesis 14- There is difference between ICD practice "old" and "new" companies. The tests show that there is a significance difference in level of disclosure of the sampled companies based on "old" and "new" independent *t*-test result ($t = 3.078$, $df = 115$, $p = 0.003$). Coakes and Ong (2011) and Pallant (2003) submit that if the significant value of t-test of equality is less than 0.05, there is a significant difference between the two groups. The significance level for *t*-test for equality of mean is 0.003 less than 0.05 indicating that there is a significant difference in the mean scores of the disclosure of "old" and "new" companies. Table 5.11 presents the descriptive statistic of the level of IC disclosure of the two groups (old and new) followed by independent t-test result in Table 5.11(b).

Table 5.11
Descriptive Statistics of the level of IC Disclosure by "Old" and "New" Companies for 2008

Items	Old Mean	New Mean	Old Max.	New Max.	Old Min	New Min	Old SD	New SD
Know.how	0.40	0.42	1	1	0	0	0.40	0.39
Education	0.37	0.38	1	1	0	0	0.47	0.47
Voc.qfn	0.12	0.15	1	1	0	0	0.33	0.36
Work-relat.kldge	0.47	0.59	1	1	0	0	0.33	0.31
Work-relat. comp	0.13	0.37	1	1	0	0	0.42	0.49
Entrepre. Spirit	0.12	0.34	1	1	0	0	0.42	0.47
Patents	0.39	0.86	1	1	0	0	0.49	0.34
Copyright	0.12	0.62	1	1	0	0	0.33	0.49
Trademark	0.22	0.82	1	1	0	0	0.42	0.39
Mgt.phil	0.21	0.28	1	1	0	0	0.41	0.43
Mgt.proc	0.21	0.54	1	1	0	0	0.41	0.50
Corp.cul	0.23	0.63	1	1	0	0	0.42	0.49
Inf.sys	0.19	0.60	1	1	0	0	0.49	0.40
Networks	0.17	0.57	1	1	0	0	0.38	0.33
Fin.relatn	0.15	0.44	1	1	0	0	0.51	0.34
Brands	0.15	0.34	1	1	0	0	0.51	0.45
Customers	0.22	0.45	1	1	0	0	0.39	0.33
Cust. Loyalty	0.12	0.43	1	1	0	0	0.48	0.49
Company name	0.67	0.91	1	1	0	0	0.32	0.35
Distr. Channel	0.39	0.40	1	1	0	0	0.43	0.50
Bus. Collaboratn	0.12	0.56	1	1	0	0	0.49	0.31
Licensing	0.13	0.48	1	1	0	0	0.49	0.30
Fav. Contracts	0.15	0.23	1	1	0	0	0.34	0.44
Franchising	0.10	0.23	1	1	0	0	0.48	0.39
ICD SCORE	5.52	8.19	24	24	0	0	1.40	1.42

Table 5.11 (b)
Independent t-test Result (Comparison of Disclosure of IC by Companies (Old and New)

Variable	Company	N	Mean	SD	T	P
ICD	New	58	5.52	1.42	3.078	0.003
	Old	59	8.19	1.40		
Total		117				

*p = 0.05

A non-parametric statistics Mann Whitney U-test was also conducted to check whether there will be difference in the result produced from independent t-test which is parametric statistics.

5.6.2 Mann-Whitney U Test Showing Intellectual Capital Disclosure Level

This study also used Mann-Whitney U Test to further confirm and complement the independent *t*-test result. Pallant (2007) argue that Mann-Whitney U test having Z value with P value less than or equal to 0.05, indicates there is a significant difference between the group. The result of the Mann-Whitney U test reveals Z value of -.3.875, p= 0.000 less than p-value (0.05); suggesting that there is a significant difference in the intellectual capital disclosure of the two groups. The Mean Rank Table 5.11 (d) is also presented to show the direction of the difference as suggested by Pallant (2007). This test was conducted to answer research question 2.

Table 5.11 (c)
Mann-Whitney U Test Result

Test Statistics[a]	
	TICDs
Mann-Whitney U	934.500
Wilcoxon W	1.970
Z	-3.875
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Company	

Table 5.11 (d)
Ranks for Mann Whitney U Test

Ranks					
	Company	N	Mean Rank	Sum of Ranks	Median
TICDs	New companies	58	68.52	4933.50	12.0000
	Old companies	59	43.77	1969.50	5.0000
	Total	117			

Tables 5.11(c and d) showed that 'new' companies IC disclosure is more than that of the 'old' companies. This result is in support of the result obtained in the previous study by Abdolmohammadi, (2005). Ceccagnoli, Arora, Cohen and Vogt (1998) argue that differences in the companies' capabilities and nature affect their ability to disclose IC.

5.6.3 The Effect of Statement of Accounting Standard 22

In this section, the researcher compares IC disclosure (ICD) performance level of the sampled companies based on 'before'[7] and 'after'[8] the release of Statement of Accounting Standard (SAS) 22, using independent *t*-test. The test was conducted to examine the ICD performance of sampled companies in the first two years (2004 and 2005) which stands for 'before' the release of SAS 22 with the two years (2007 and 2008) 'after' the release of SAS 22 to answer research question 4 and to test for the

[7] ICD performance in 2004 and 2005
[8] ICD performance in 2007 and 2008

hypothesis 15 - There is difference between ICD performance of sampled companied before and after SAS 22. Table 5.12 (a and b) show the results of the two groups.

Table 5.12(a)
Descriptive Statistics of Intellectual Capital Disclosure Before (2004 and 2005) SAS 22

Items	2004 Mean	2005	2004 Max.	2005 Max.	2004 Min	2005 Min	2004 SD	2005 SD
Know.how	0.86	0.88	1	1	0	0	0.34	0.32
Education	0.87	0.89	1	1	0	0	0.33	0.31
Voc.qfn	0.65	0.66	1	1	0	0	0.47	0.47
Work-relat.kldge	0.75	0.76	1	1	0	0	0.43	0.42
Work-relat. comp	0.76	0.77	1	1	0	0	0.42	0.41
Entrepre. Spirit	0.84	0.85	1	1	0	0	0.36	0.35
Patents	0.82	0.86	1	1	0	0	0.38	0.34
Copyright	0.28	0.28	1	1	0	0	0.45	0.45
Trademark	0.29	0.30	1	1	0	0	0.45	0.46
Mgt.phil	0.21	0.23	1	1	0	0	0.41	0.42
Mgt.proc	0.37	0.40	1	1	0	0	0.48	0.49
Corp.cul	0.23	0.26	1	1	0	0	0.42	0.44
Inf.sys	0.41	0.43	1	1	0	0	0.49	0.49
Networks	0.17	0.19	1	1	0	0	0.38	0.39
Fin.relatn	0.37	0.41	1	1	0	0	0.48	0.49
Brands	0.42	0.49	1	1	0	0	0.49	0.49
Customers	0.44	0.50	1	1	0	0	0.49	0.50
Cust. Loyalty	0.58	0.49	1	1	0	0	0.49	0.49
Company name	0.68	0.45	1	1	0	0	0.46	0.45
Distr. Channel	0.46	0.50	1	1	0	0	0.50	0.50
Bus. collaboratn	0.41	0.49	1	1	0	0	0.49	0.49
Licensing	0.58	0.49	1	1	0	0	0.49	0.49
Fav. Contracts	0.42	0.49	1	1	0	0	0.49	0.49
Franchising	0.55	0.50	1	1	0	0	0.50	0.49
ICD SCORE	12.51	12.89	24	24	0	0	1.40	1.39

Table 5.12(b)
Descriptive Statistics of Intellectual Capital Disclosure After (2007 and 2008) SAS 22

Items	2007 Mean	2008 Mean	2007 Max.	2008 Max.	2007 Min	2008 Min	2007 SD	2008 SD
Know.how	0.88	0.86	1	1	0	0	0.32	0.34
Education	0.90	0.91	1	1	0	0	0.29	0.28
Voc.qfn	0.70	0.72	1	1	0	0	0.45	0.44
Work-relat.kldge	0.77	0.76	1	1	0	0	0.41	0.42
Work-relat. comp	0.76	0.76	1	1	0	0	0.42	0.42
Entrepre. Spirit	0.86	0.87	1	1	0	0	0.34	0.33
Patents	0.87	0.88	1	1	0	0	0.33	0.31
Copyright	0.30	0.32	1	1	0	0	0.46	0.47
Trademark	0.34	0.35	1	1	0	0	0.47	0.47
Mgt.phil	0.27	0.28	1	1	0	0	0.44	0.45
Mgt.proc	0.41	0.42	1	1	0	0	0.49	0.49
Corp.cul	0.28	0.29	1	1	0	0	0.45	0.45
Inf.sys	0.45	0.47	1	1	0	0	0.49	0.50
Networks	0.21	0.23	1	1	0	0	0.41	0.42
Fin.relatn	0.43	0.45	1	1	0	0	0.49	0.49
Brands	0.45	0.47	1	1	0	0	0.49	0.50
Customers	0.47	0.52	1	1	0	0	0.50	0.50
Cust. Loyalty	0.59	0.64	1	1	0	0	0.49	0.48
Company name	0.71	0.73	1	1	0	0	0.45	0.44
Distr. Channel	0.48	0.47	1	1	0	0	0.50	0.50
Bus. collaboratn	0.45	0.50	1	1	0	0	0.49	0.50
Licensing	0.60	0.63	1	1	0	0	0.49	0.48
Fav. Contracts	0.45	0.47	1	1	0	0	0.49	0.50
Franchising	0.58	0.61	1	1	0	0	0.49	0.48
ICD SCORES	13.30	13.71	24	24	0	0	1.39	1.40

After the assessment of ICD based on all the items/attributes, independent t-test was also conducted to confirm the ICD results. According to Coakes and Ong (2011), and Pallant (2003), if *t*-test of equality having a significant value greater than 0.05, then there is no significant difference in the mean scores, assuming that the mean scores are equal. The result of independent *t*-test of equality of mean (t = 0.593, df = 115, p = 0.554) has its p-value greater than 0.05; thus the ICD performances of the sampled

companies are equal when comparing 'before' and 'after' the release of SAS 22. With the results in Tables 5.12 (a and b), both the mean scores of the two periods are similar (12.5, 12.89 and 13.30, 13.71). The differences between these means scores in the two groups are less than 1(0.79, 0.82). Table 5.13 (a and b) shows that there is no significant difference in the ICD performance of sampled companies before and after release of SAS 22 thus, confirming the results in Table 5.12 (a and b).

Table 5.13 (a)
Comparison of Companies Performance Before and After SAS t-test for Equality of Mean

		F	**sig**	**t**
ICD before and after SAS 22	Equal variance assumed	127	0.554	0.593
	Equal variance not assumed			0.594

Table 5.13 (b)
Group Statistics for Comparing Companies Performances Before And After SAS 22

ICD Performance	**N**	**Mean**	**Std. Dev**	**Std. Error mean**
2004 and 2005	117	12.70	1.395	1.09588
2007 and 2008	117	13.51	1.395	1.09588

5.7 Inferential Statistics and Measurement of Relationships

In order to answer all the research questions, 15 hypotheses were tested using independent t-test and multiple linear regressions so that the results of the study can be inferred statistical. Hypotheses 1 and 8 test the direct relationship between IC efficiency and company performance, while hypotheses 9 to 12 test the direct relationship between capital employed efficiency (CEE) and company performance. Capital employed is one of the indicators of efficiency in VAIC model used in this study. Therefore, there is the need to test for CEE in relation to company

performance. The hypotheses 13 to 15 test the difference between IC categories (HC, SC and RC), and the difference between ICD of "old" and "new" companies. And the last hypothesis tests the difference between ICD performance of the sampled companies before and after the release of SAS 22. The research hypotheses tested are presented below:

Hypothesis 1: There is a positive relationship between human capital efficiency and ROE *(ceteris paribus).*

Hypothesis 2: There is a positive relationship between structural capital efficiency and ROE *(ceteris paribus).*

Hypothesis 3: There is a positive relationship between human capital efficiency and ROA *(ceteris paribus).*

Hypothesis 4: There is a positive relationship between structural capital efficiency and ROA *(ceteris paribus).*

Hypothesis 5: There is a positive relationship between human capital efficiency and CIS *(ceteris paribus*).

Hypothesis 6: There is a positive relationship between structural capital efficiency and CIS *(ceteris paribus*).

Hypothesis 7: There is a positive relationship between human capital efficiency and MV *(ceteris paribus*)**.**

Hypothesis 8: There is a positive relationship between structural capital efficiency and MV (*ceteris paribus).*

Hypothesis 9: There is a positive relationship between capital employed efficiency and ROE *Ceteris Paribus*

Hypothesis 10: There is a positive relationship between capital employed efficiency (CEE) and ROA *Ceteris Paribus*

Hypothesis 11: There is a positive relationship between capital employed efficiency (CEE) and CIS *Ceteris Paribus*

Hypothesis 12: There is a positive relationship between capital employed efficiency (CEE) and MV *Ceteris Paribus*

Hypothesis 13: There is difference between IC disclosure categories (HC, SC and RC) of the sampled companies

Hypothesis 14: There is difference between ICD practice "old" and "new" companies

Hypothesis 15: There is difference between ICD performance of sampled companied before and after SAS 22

5.7.1 Multiple Regressions Analyses

In this study, multiple regression analysis was further used to examine the relationship between IC efficiency and company performance in order to answer question 3. Before regression was conducted, the research data were screened through series of tests such as testing for outliers (see box plot in appendix "E", normality test (see Table 5.1, page 137), test for multicollinearity (see Table 5.2, page 138), test for homoscedascity (see table 5.4, page 141). Having screed the data and conformed with the linearity assumptions, multiple regressions were performed to establish the relationship and the direction of the relationship that exist among the IC efficiency, control variables and company performance variables. Table 5.14 to 5.17 show the results of the multiple regressions for the four years (2007 to 2010). Each table presents the four regression models results showcasing the relationship between IC efficiencies, control variables and company performance measures. Model 1 stands for ROE results, followed by model 2 – ROA results, model 3 – CIS results and model 4 – MV results. Table 5.14, 5.15, 5.16 and 5.17 show regression analyses results for the years 2007, 2008, 2009 and 2010 respectively.

Table 5.14
2007: Regression Results of the Four Models (ROE, ROA, CIS and MV)

Variables	**Model 1**	**t**	**Model 2**	**T**	**Model 3**	**t**	**Model 4**	**t**
Constant	-4.899	-3.01	1.648	1.45	2.167	3.39	18.801	5.68
HCE	0.345	5.16	-0.013	-0.21	-0.095	-2.73	-0.003	-0.02
SCE	-4.081	-4.73	-0.569	-2.17	0.086	0.58	5.855	-3.64
CEE	0.026	0.25	1.372	8.96	0.549	6.36	0.411	1.09
SIZE	0.011	0.123	0.020	0.23	0.001	1.05	0.003	1.32
LEV	0.010	0.201	0.006	0.00	0.003	0.07	0.005	0.03
SEC	0.221	3.701	0.212	3.52	0.330	2.65	0.317	3.42
sig	0.003**		0.149		0.001**		0.000***	
R^2	0.674%		0.469%		0.275%		0.520%	
Durbin Watson	1.673		1.989		1.900		1.719	
F	31.975		5.473		4.187		24.382	
n = 117								

**p<0.05, ***p<0.001

Table 5.15
2008: Regression Results of the Four Models (ROE, ROA, CIS and MV)

Variables	**Model 1**	**t**	**Model 2**	**T**	**Model 3**	**t**	**Model 4**	**t**
Constant	-2.476	-1.36	-2.651	-0.56	-0.483	-0.74	16.839	2.45
HCE	0.167	1.97	0.376	1.96	-0.018	-0.54	-0.007	-0.07
SCE	-0.220	-2.50	-4.391	-1.77	0.001	0.00	-0.337	-3.66
CEE	0.041	0.63	1.510	5.17	0.076	1.40	0.050	0.57
SIZE	0.019	0.01	0.100	0.31	0.107	0.22	0.114	0.85
LEV	0.026	0.34	0.013	0.27	0.037	0.06	0.190	0.42
SEC	0.243	2.54	0.269	2.50	0.342	2.76	0.515	3.92
sig	0.176		0.041**		0.461		0.016**	
R^2	0.575%		0.469%		0.296%		0.406%	
Durbin Watson	2.058		1.989		1.873		2.163	
F	17.422		5.473		4.720		11.270	
n = 117								

*p<0.05, ***p<0.001

Table 5.16
2009: Regression Results of the Four Models (ROE, ROA, CIS and MV)

Variables	**Model 1**	**t**	**Model 2**	**T**	**Model 3**	**t**	**Model 4**	**t**
Constant	7.896	6.99	-8.471	-5.36	10.352	6.53	-9.4.16	-4.49
HCE	0.460	4.87	0.453	3.93	0.416	3.98	0.567	3.83
SCE	0.635	5.13	0.561	5.77	0.340	3.82	0.616	5.46
CEE	0.422	2.48	0.211	3.33	0.241	3.81	0.279	1.16
SIZE	0.008	1.03	0.001	1.51	0.027	0.89	0.131	0.31
LEV	0.021	0.75	0.050	0.84	0.113	0.46	0.115	1.54
SEC	0.119	3.67	0.206	4.49	0.215	3.62	0.269	4.84
Sig	0.000***		0.000***		0.000***		0.000***	
R^2	0.654%		0.767%		0.616%		0.615%	
Durbin Watson	1.794		1.853		1.806		2.214	
F	22.707		9.398		9.375		22.548	
n = 117								

*p<0.05, ***p<0.001

Table 5.17
2010: Regression Results of the Four Models (ROE, ROA, CIS and MV)

Variables	**Model 1**	**t**	**Model 2**	**T**	**Model 3**	**t**	**Model 4**	**t**
Constant	14.136	8.73	-12.216	-.634	9.341	5.33	11.570	5.63
HCE	0.615	6.65	0.265	4.27	0.522	3.97	0.264	4.74
SCE	0.861	7.60	0.316	3.89	0.540	4.63	0.316	4.54
CEE	0.244	3.90	0.290	3.76	0.394	3.88	0.290	3.69
SIZE	0.182	0.64	0.002	0.86	0.103	0.74	0.121	1.86
LEV	0.086	0.52	0.020	0.69	0.125	0.50	0.130	0.57
SEC	0.201	2.76	0.261	4.53	0.103	2.85	0.323	4.48
sig	0.000***		0.000***		0.000***		0.000***	
R^2	0.618%		0.785%		0.421%		0.762%	
Durbin Watson	1.775		2.002		1.938		2.113	
F	8.466		4.144		13.262		29.185	
n = 117								

*p<0.05, ***p<0.001

5.7.2 Significance Estimates of the Study

The significance for all the variables under this study was determined following the suggestions of Pallant (2007, 2003); Tabachnick and Fidell, (2007). They argued that, t-calculated should be compared with t-distribution table. If the t-calculated value is greater than 1.96 or lesser than -1.96, the estimates are considered to be significant at alpha = 0.05. If the t- calculated is greater than 2.56 or lesser than -2.56 for a two tailed test then, the estimates are considered to be significant at alpha = 0.01. Following this background, the significance of each variable was determined using statistical significance of the t- calculated value compared with the t-distribution table at alpha = 0.05 for this study.

5.7.3 Hypothesis 1: There is Positive Relationship between Human Capital Efficiency and ROE

Hypothesis 3 states that there is positive relationship between human capital efficiency and ROE. The result of the coefficient revealed that human capital efficiency is positively related to ROE based on the standardized coefficient = 0.567, t = 6.645, p< 0.05; 0.377, t = 4.865, p< 0.05. Thus, the hypothesis 1 is supported.

5.7.4 Hypothesis 2: Structural Capital Efficiency Positively Predicts ROE

Hypothesis 2 states that structural capital efficiency positively predicts ROE. The result of the regression analysis showed that structural capital efficiency predicts companies' ROE based on the standardized coefficient = 0.703, t = 7.600, p< 0.05; 0.527, t = 5.132, p< 0.05). Hence, the hypothesis 2 is supported.

5.7.5 Hypothesis 3: There is Positive Relationship between Human Capital Efficiency and ROA

Hypothesis 3 states that there is positive relationship between human capital efficiency and ROA. The coefficient result showed that human capital efficiency is positively related to ROA. Standardized coefficient = 0.344, t = 4.271, p<0.001; 0.319, t = 3.935, p<0.001. Therefore the hypothesis 3 is supported.

5.7.6 Hypothesis 4: There is Positive Association between Structural Capital Efficiency and ROA

It is hypothesized that there is positive association between structural capital efficiency and ROA. The coefficient result showed that structural capital efficiency is positively associated with ROA. Standardized coefficient = 0.336, t = 3.890, $p<0.001$; 0.390, t = 5.773, $p<0.05$. Thus, the hypothesis 4 is supported.

5.7.7 Hypothesis 5: Human Capital Efficiency is Positively Related to CIS

It is hypothesized that human capital efficiency is positively related to CIS. The coefficient result showed that human capital efficiency is related to CIS. Standardized coefficient = 0.426, t = 3.965, $p<0.05$; 0.366, t = 3.984, $p<0.001$; 0.362, t = 2.801, $p<0.05$. Therefore, this hypothesis 5 is supported.

5.7.8 Hypothesis 6: Structural Capital Efficiency is Positively Related to CIS

Hypothesis 6 states that structural capital is positively related to CIS. The coefficient result revealed that structural capital efficiency is related to CIS. Standardized coefficient = 0.438, t = 4.632, $p<0.001$; 0.358, t = 3.822, $p<0.001$. Hence, this hypothesis 6 is supported.

5.7. 9 Hypothesis 7: There is a Positive Relationship between Human Capital Efficiency and MV

The hypothesis 7 states that, there is a positive relationship between human capital efficiency and MV. The result of the study showed there is relationship between the

two variables. Standardized coefficient = 0.343, t = 4.744, p<0.001; 0.441, t = 3.827, p<0.05, which is significant. Hence, the hypothesis 7 is supported.

5.7.10 Hypothesis 8: There is a Positive Relationship between Structural Capital Efficiency and MV

Hypothesis 8 states that there is a relationship between structural capital efficiency and MV. The result of coefficient revealed that there is relationship between the two variables based on the standardized coefficient =- 0.315, t = 4.543, p<0.05; 0.596, t = 5.459, p<0.001, which is significant. Hence, the hypothesis 8 is supported.

5.7.11 Hypothesis 9: There is a Positive Relationship between Capital Employed Efficiency and ROE

Hypothesis 9 states that, there is a positive relationship between capital employed efficiency and ROE. The result of this study showed a positive relationship between the two variables based on standardized coefficient = 0.244, t = 3.903, p<0.001, which is significant. Hence, the hypothesis 9 is supported.

5.7.12 Hypothesis 10: There is a Positive Relationship between Capital Employed Efficiency and ROA

Hypothesis 10 postulates that, there is a positive relationship between capital employed efficiency and ROA. The result of this study confirmed a positive relationship between the two variables based on standardized coefficient = 1.372, t = 8.957, p<0.001; 1.510, t = 5.165, p<0.001, 0.211, t = 3.330, p<0.001, which is significant. Hence, the hypothesis 10 is supported.

5.7.13 Hypothesis 11: There is a Positive Relationship between Capital Employed Efficiency and CIS

The hypothesis 11 states that, there is a positive relationship between capital employed efficiency and CIS. With the result of the standardized coefficient = 0.549, t = 6.362, $p<0.05$; 0.394, t = 3.878, $p<0.05$, and 0.241, t = 3.818, $p<0.05$, which is significant. There is a positive relationship between the two variables. Hence, the hypothesis 11 is supported.

5.7.14 Hypothesis 12: There is a Positive Relationship between Capital Employed Efficiency and MV

Hypothesis 12 stipulates that, there is a positive relationship between capital employed efficiency and MV. The result of this study confirmed a positive relationship between the two variables. Standardized coefficient = 0.290, t = 3.695, $p<0.05$, which is significant. Hence, the hypothesis 12 is supported. Sequel to the hypotheses testing using regression analysis to answer research question 3, are the testing of the remaining hypotheses 13 to 15 to answer the research question 1, 2 and 4 for ICD.

5.7.15 Hypothesis 13: There is a Difference between ICD Categories (HCD, SCD and RCD) of the Sampled Companies

Hypothesis 13 stipulates that, there is a difference between ICD categories (HCD, SCD and RCD) of the sampled companies. The result obtained revealed that there is a difference in the scores of the three IC categories in term of disclosure. HCD has the following mean scores for the four years, 4.75, 4.80, 4.89 and 4.90. SCD mean scores are 3.18, 3.41, 3.58, and 3.73, while RCD mean scores are 4.58, 4.68, 4.83 and 5.08. These results show that there is difference in the scores of the three ICD categories. Thus, the hypothesis 13 is supported.

5.7.16 Hypothesis 14: There is a Difference between ICD Practice of "Old" and "New" Companies

Hypothesis 14 stipulates that, there is a difference between ICD practice of "old" and "new" companies. The result of independent t-test (t = 3.078, p = 0.003), revealed that there is significant difference between ICD of "old" and "new" companies. Therefore, the hypothesis 14 is supported.

5.7.17 Hypothesis 15: There is a difference between ICD Performance Before and After SAS 22 of the Sampled Companies

Hypothesis 15 states that, there is a difference between ICD performance before and after SAS 22. The result of independent t-test (t = 0.593, p = 0.554), revealed that there is no significant difference between ICD performance of "before" and "after" the release of SAS 22. Therefore, the hypothesis 15 is not supported. The summary of the result of the tested hypotheses is presented in Table 5.18.

Table 5.18
Summary of the Tested Hypotheses

Research Hypotheses	**Results**
H1: There is a positive relationship between structural capital efficiency and ROE	*Significant, thus supported*
H2: There is a positive relationship between human capital efficiency and ROE	*Significant, thus supported*
H3: There is a positive relationship between structural capital efficiency and ROA	*Significant, thus Supported*
H4: There is a positive relationship between human capital efficiency and ROA	*Significant, thus Supported*
H5: There is a positive relationship between structural capital efficiency and CIS	*Significant, thus Supported*
H6: There is a positive relationship between human capital efficiency and CIS	*Significant, thus Supported*
H7: There is a positive relationship between Structural capital efficiency and MV	*Significant, thus Supported*
H8: There is a positive relationship between human capital efficiency and MV	*Significant, thus Supported*
H9: There is a positive relationship capital employed efficiency and ROE	*Significant, thus Supported*

H10: There is a positive relationship capital employed efficiency and ROA	*Significant, thus Supported*
H11: There is a positive relationship capital employed efficiency and CIS	*Significant, thus Supported*
H12: There is a positive relationship capital employed efficiency and MV	*Significant, thus Supported*
H13: There is a difference between ICD categories (HCD,SCD and RCD)	*Significant, thus Supported*
H14: There is a difference between ICD practice by old and new companies	*Significant, thus Supported*
H15: There is a difference between ICD performance before and after SAS 22 by sampled companies	*Not supported, thus Rejected*

5.8 Chapter Summary

This chapter covers data analysis procedure. Preliminary tests were conducted. These normality test of the distribution (page 137); test for mullticollinearity (page 138) heteroscedascity test (Table 5.4), test for group differences using independent t-test, (Table 5.11a, page 157) and Mann-Whitney U test (Table 5.11b page 158). These tests were conducted to screen the data used in this research so as to provide reliable answers to the research questions. Descriptive statistics analysis was performed to address research question 1, independent t-test conducted to address research questions 2 and 4. Lastly, multiple regressions analyses were run to test the research hypotheses which provide answer to research question 3.

Summary of the regression results, in 2007 (see Table 5.14, page 164), HCE was significant and positively related to ROE but inversely related with CIS. SCE was negatively related to ROE and MV but not significant related to ROA and CIS. The same was the trend in 2008 (Table 5.15, page 165), but there was a remarkable improvement in the performance of intellectual capital efficiency with company performance measure from 2009 to 2010 (see Table 5.16, page 165 and Table 5.17, page 165).

The variables were not only significant but were also positively related to all the company performance measures throughout the two years. However, out of the three control variables, only sector was significantly related to all the four company performance measures, the other two control variables (size and leverage) were insignificantly. Complimenting these results are R^2, F statistics and Durbin Watson values. Although, there is no specified acceptable R^2 that determines the fitness of the model, Latin, Douglas and Green (2003) argue that there is no absolute standard value for an acceptable fit, when dealing with social sciences data. However, they suggest R^2 values ranging from 0.1 and 0.5 and add that when testing hypotheses, goodness of fit takes the back seat compare with statistical significance as the yardstick for evaluating models. In this study, the R^2 values range from 0.57 to 0.67 which are greater than 0.10, hence, the assumption of fitness of the model is achieved. F statistics results range from 4.144 to 31.975, while the Durbin Watson range from 1.67 to 2.21. This indicates that the statistical tool (regression model) is good enough to analyze the data for this study. Out of these fifteen (15) hypotheses testing conducted, fourteen (14) were supported, while only one (1) was rejected. Next is the discussion of research findings.

CHAPTER SIX
DISCUSSION OF THE RESEARCH FINDINGS

6.1 Introduction

This section deals with the discussion of the research results presented in chapter five of this study in line with the study objectives. This includes (1) Intellectual capital disclosure (ICD) in the financial statements/annual reports (2) Differences in intellectual capital disclosure practice by traditional (old) companies and emerging (new) companies; intellectual capital efficiency in relation to companies' performance and Intellectual capital disclosure (ICD) performance before and after the release of Statement of Accounting Standard (SAS) 22. This is arranged according to the research questions proposed in this study.

6.2 Intellectual Capital Disclosure in Financial Statement

The results of the IC disclosure are in two parts, one part showing the IC disclosure in accordance with the three main categories and the second part showing the overall ICD in the annual reports of the sampled companies. According to the three main ICD categories mean scores, human capital has the highest scores in the first three years (2007, 2008 and 2009) with 37.96%, 32.23% and 36.77% disclosure among the three, followed by relational capital with 37.05% having the highest mean score in 2008.

On the other hand, structural capital has the lowest mean scores among the three IC categories among the sampled companies. This finding is consistent with previous researchers such as Oliveras et al. (2006) and Abeysekera and Guthrie (2005). Oliveras et al. (2006) analyzed sample of Portuguese companies and found that human capital was the most disclosed among the sample companies. Likewise, the study of Abeysekera and Guthrie (2005) who conducted research on IC disclosure of Sri Lanka companies also found the same result. Impliedly, the finding shows that Nigerian companies IC disclosure practice is the same level as practiced by companies in the developing countries.

In addition to the above submission, the overall intellectual capital disclosure (ICD) is the summation of Human capital disclosure (HCD), structural capital disclosure (SCD) and relational capital disclosure (RCD). It can be deduced from the results that out of 5 items (attributes) under human capital (HC) 4.75, 4.8, 4.89 and 4.90 items were disclosed on average by the sampled companies based on 2004, 2005, 2007 and 2008 years of observations. For structural capital (SC) out of 9 items, 3.18, 3.41, 3.58 and 3.73 items were disclosed for 2004 to 2008. The last IC category- relational capital, out of 9 items, 4.58, 4.68, 4.83 and 5.08 represent the numbers of RC disclosed for 2004 to 2008 by the sampled companies.

In summary, the IC disclosure of the sampled companies in Nigeria is above average for the four years. Based on the 24 items, 52.1%, 53.70%, 55% and 57% were disclosed in the annual reports of the sampled companies. This finding is in line with Rahim et al. (2011). Rahim et al. (2011) examined the IC reporting of Technology Industry in Malaysia. They found that IC reporting practice of this industry is above average, thus, Nigerian companies are not behind its counterpart (developing) countries in term of IC disclosure. This result could also be attributed to the fact that, every company now realised the importance of IC for sustainability in this challenged economy (Aduwa-Ogiegaen & Iyamu, 2005). Also, because of the emphasis NASB placed on IC recently.

6.3 Intellectual Capital Disclosure Practice and ICD Performance

Data were tested for differences in the intellectual capital disclosure practice between the traditional companies ‘old’ and the emerging companies ‘new’ to answer research objective 2 and to test for hypothesis 14. And also the ICD performance of sampled companies was also tested whether there is difference between companies’ ICD performance before (2004 to 2005) and after (2007 to 2008) the release of SAS

22 to answer the research objective 4 and to test for hypothesis 15. The findings are stated below:

6.3.1 Intellectual Capital Disclosure of Traditional 'Old' and Emerging 'New' Companies

The result of the independent t-test and Mann-Whitney U test show that there is significant difference in intellectual capital disclosure (ICD) of 'old' and 'new' companies. Meaning that, both groups (old and new) ICD is not the same. Impliedly, companies disclose their IC according to what they think is best for them to disclose going by stakeholders' theory. The result of this study provides support for the earlier studies. Firstly, this study provides that those companies with highest disclosure of IC were 'new' emerging companies. Secondly, the study also reveals industry effect because there is empirical evidence showing that the 'old' and 'new' companies IC disclosure are significantly different. This finding is consistent with Abdolmohammadi, (2005) finding. He reported that companies which disclosed more IC information do so to indicate their wealth creation capabilities. Abdolmohammadi, (2005) conducts an empirical study of 58 *Fortune 500* companies over the five year periods of 1993-1997.

The reason for this result is probably owing to the fact that the "new" companies are intellectual capital intensive are being emerging companies that are moving towards the global trend in term of operational resources (Abdolmahammadi, 2005) than the "old" companies that are traditional companies which used more of physical capital (tangible) as their operational resources (Firer and Williams, 2003). In addition, the sampled companies uphold the stakeholder theory, which says that individual company will voluntarily disclose what will benefit its stakeholders.

6.3.2 Intellectual Capital Disclosure Performance Before and After SAS 22

In order to examine the difference between ICD performance before and after SAS 22 of the sampled companies, independent t-test was conducted. The result shows that there was no significant difference in the mean scores of 'before' and 'after' the release of SAS 22. What accounted for this finding may be probably associated with the fact that there was no specific accounting standard on IC disclosure in Nigeria, before SAS 22. And even the SAS 22 is only on R&D disclosure. Thus, disclosure of internally developed IC is voluntary.

More so, it is not easy to determine ICD performance in new accounting regulation. This finding is consistent with the submission of Shukor et al. (2009) that examine the intangible asset performance of Malaysia companies before, during and after accounting regulation and between weak and strong economy. They submit that for companies in a weak and new accounting regulation, the intangible (IC) asset performance might not be easily determined at the early stage of accounting regulation.

6.4 Findings from Hypotheses Testing the Relationship between Intellectual Capital Efficiency and Companies' Performance

The results of this research work supported all the twelve (12) hypotheses testing the relationship between intellectual capital efficiency and company performance showing the value added potentiality of intellectual capital components and capital employed. These results show positive relationship at different level of significance supporting the two theories (Resource-based theory and Intellectual Capital View) used in this study. The results presented were arrived at after controlling for independent variables with size, leverage and sector to reduce the effect of individual company's distinct characteristics in order to have unbiased results.

6.4.1 The Relationship between Structural Capital Efficiency and Company Performance

This study found evidence to support the predicting power of structural capital efficiency (SCE) in enhancing companies' performance through regression analysis. The result show that SCE has a significant positive relationship with Return on equity (ROE), Return on assets (ROA), Change in sales (CIS) and Market value (MV) as it was found in most of the previous studies that found positive relationship between structural capital value indicators and company performance. For example Gu and Li, (2010), Joshi and Hanssens (2010) studies. Gu and Li (2010), investigated relationship between advertising (structural capital value indicator) and firm's stock price and return on pharmaceutical companies. The results of their study found that there is a relationship between advertising expenditure and firm's stock price and return. Joshi and Hanssens (2010) examined the direct and indirect effects of advertising spending on firm value performance. They found advertising spending positively related to firm's market capitalization. These findings are not restricted to recent studies; there are earlier studies with similar results. In the earlier studies, Hanssens, Parsons and Schultz, (2001) argued that in competitive markets, active advertising is shown to be useful for keeping up with competition by preserving a firm's market share.

These findings are in contrast to few studies' findings applying the same value added intellectual capital coefficient (VAIC) and company performance using R&D and advertising as measure of structural capital. Gu and LI (2010) found R&D to be insignificant in relation to future earning in their study on value-relevance of advertising of pharmaceutical companies. Examples of studies with negative findings using VAIC method are: Chen et al., (2005) who carried out a study on Taiwanese companies using VAIC, found a negative relationship between structural capital and financial performance. Firer and William (2003) conducted an empirical investigation

on South African 75 publicly listed companies, found only capital employed efficiency to be related with company performance. Nazari (2010), investigated relationship between IC components and financial performance of UK companies by applying VAIC model. The study found a negative relationship between structural capital and financial performance.

The difference in the findings of the present study and the above discussed studies could be explained by the sample characteristics. Chen et al. (2005) used only manufacturing companies where capital employed efficiency was the most significant variable to financial performance. The Taiwanese companies were manufacturers; hence, their efficiency was more driven by capital employed. The same thing applied to Firer and Williams's (2003) study that used 75 public listed South African business sectors. The South African companies are heavily relied on physical asset. But the sample of this present study is made up of 14 sectors grouped into 8 sectors comprising of manufacturing, construction and building material, Food and beverages, service companies, automobile and tyre, technology and communication etc. As structural capital in both the sectors of the economy for competitiveness, creativity for sustainability, structural capital efficiency was found to be important for all these sectors.

Conclusively, as could be deduced from the findings of this study, the SCE has a significant positive relationship with company performance. And also, the study reveals that the higher the companies' investment in structural capital the higher the return and efficiency of the structural capital performance. Meaning that, investments of sampled companies are justified because it added value to these companies and the variables used as measures of SCE are adequate to measure it.

6.4.2 The Relationship between HCE and Company Performances

The findings of this study provide support for relationship between human capital and (ROE, ROA, CIS and MV) company performance. Meaning that all the indicators used in measuring human capital and company performance are suitable for this study and the investments of the sampled companies in human capital are commensurate and adequate to add value to these companies in line with the theories used in this study. This result is consistent with some earlier studies such as Maditinos et al. (2011); Lajili and Zeghal, (2006); Abdel-Khalik, (2003); Rosett (2003). Maditinos et al. (2011) study found only human capital efficiency significant and positive related with company performance (ROE and ROA). Rosett (2003) found human capital asset significantly and positively related with market value. Therefore, this study confirmed the argument of Pulic (2002) that says human capital is the back bone of structural capital and company performance. The implication of this result is that, the higher the investment in human capital, the higher the return. And also the investment in human capital in sampled companies is worthwhile and effectively utilized because there is an increase in the value added efficiency of human capital between 2007 and 2010.

In summary, this study found structural capital efficiency and human capital efficiency adequately creating value in the sampled companies. Therefore, these IC components should be properly nurtured and managed by the sampled companies in order to continue to add value.

6.5 Chapter Summary

This chapter discusses of the findings of this study. It deals with how the findings relate to the research objectives and was presented according to each research objective of this study. And also the chapter shows the consistence of the findings with previous studies.

CHAPTER SEVEN
SUMMARY AND CONCLUSION

7.1 Introduction

> "The entire edifice of financial reporting of publicly listed companies is pragmatic creation, born of political economy. It is a residual legal artefact of the historical opposition between corporations that do not want to disclose, and shareholders who require degrees of disclosure. As such, this statutory reporting edifice has no reliable compass and arbitrary" (Ginoglou et al. 2009, p134-146).

Now, with globalization and advancement, disclosure of accounting information is imperative (IC disclosure inconclusive) if corporate body wants to remain competitive in the global market and put the desire of stakeholders in the picture. Thus, measurement of corporate value has changed with the globalization and technological advancement which rely heavily on intellectual capital (Salamudin, et al. 2010; Suraj & Bontis, 2012). With this new development, IFRS has issued guideline for disclosure of intangible of which IC is part. Some countries have started to amend their previous accounting standards in relation to IC disclosure, Nigeria inclusive. Now, to what extent is the relationship between IC efficiency and company performance? and ICD practice in Nigerian companies?

This research study aimed to examine the relationship between intellectual capital efficiency and company performance. The study was divided into two phases. The first phase dealt with intellectual capital efficiency and company performance (2007 to 2010), while the second phase dwelled into the intellectual capital disclosure practices (2004, 2005, 2007 and 2008) by the sampled companies in Nigeria. The data collected for the study covered only six years (2004, 2005, 2007, 2008, 2009 and 2010). Data for 2006 was not collected because the Statement on Accounting Standard (SAS) 22 on one driver of intellectual capital was released in 2006. For fair comparison for all the sampled companies, the study excluded data for 2006.

This study is different from the previous studies in the following by (1) expanding the Pulic (2000, 2004) VAIC Model by introducing new IC components value indicators such as compensation cost, welfare package cost and intellectual property; (2) widening the scope by covering 14 sectors of Nigerian economy; (3) providing clue to the companies' management on how to measure their IC using VAIC methods; (4) assesses the effect of Accounting Standard by examining the sampled companies' performance before and after the release of SAS 22 thus, the NASB can use this finding as a basis for issuing another standard that can improve accounting information and in turn improve company performance by financial reporting, if comply with. The detail of this study is discussed below.

The main objective of the study was to examine the relationship between intellectual capital efficiency and company performance. However, the examination of the relationship between intellectual capital efficiency and company performance cannot be achieved if we do not assess the IC disclosure of these sampled companies. Therefore, the study first assessed the IC disclosed in the annual reports of the sampled companies, measured the IC efficiency with the used of Value Added Intellectual Coefficient (VAIC model) developed by Pulic (2004, 2000). Thereafter, finds the relationship between IC efficiency and companies' performance (financial and market performance) in order to support or reject the research hypotheses developed based on the theory establishing relationship between intellectual capital efficiency and company performances.

Methodologically, this study is of two parts. The first part deals with the measurement of intellectual capital efficiency, which starts with the use of VAIC model. According to Pulic (2000, 2004), VAIC is a composite sum of two indicators: (1) intellectual capital efficiency (HCE and SCE) which is the value added (VA)

efficiency of company' intellectual capital and (2) capital employed efficiency (CEE) which is the value added (VA) efficiency of capital employed. Both ICE and CEE stand for the independent variables in this study. In other to investigate the relationship between IC efficiency and company performance, the calculated VAIC was regressed with the dependent variables (ROE, ROA, CIS and MV) with three controlled variables (Size, leverage and sector) for four years.

The second part covered the intellectual capital disclosure practice of the sampled companies in Nigeria. This section present the total disclosure level of the sampled companies based on the three main categories of intellectual capital. Human capital has the highest disclosure mean scores, followed by the relational capital, while structural capital has the least mean score. Generally, ICD of the sampled companies were above average. Based on the 24 items, 52.1%, 53.70%, 55% and 57% were disclosed in the annual reports of the sampled companies.

The findings of this study also revealed that, there is significant difference in the ICD of 'old' and 'new' companies. The 'old' companies stand for the traditional companies while the 'new' companies are the emerging companies. The result is in line with the previous studies. For example Abdolmohamad (2005) study revealed also that the ICD of 'old and 'new' companies are different. In assessing the group differences of ICD performance before and after SAS 22, the result reveals that there was no difference between the ICD performance before and after SAS 22. This finding is consistent with Shukor et al. (2009).

Sequel to ICD result is the multiple regression results. The results of the regressions revealed that human capital efficiency and structural capital efficiency are significant positively related with companies' performance, which is contrary to previous African countries' study. Specifically, Firer and Williams (2003) study of South

Africa companies do not have significant result in relation to IC efficiencies, but their study is significantly related to physical assets. But the findings of this present study are consistent with some previous studies such as Calisir et al. (2010); Maditinos et al. (2011); Shiu (2006).

The present result may be attributed to the method adopted by researcher which is called input-process-output concept. More importantly, the investment in human capital and structural capital by sampled companies are justified because there is a significant positive relationship between IC efficiency and company performance. That is, the higher the sampled company investments in human and structural capitals the higher the returns in both human capital and structural capital towards creating value to the companies. This finding confirmed the statement of Yalam and Coskun (2007), which says the higher the investment in intellectual capital the greater is company's performance. Presently, in knowledge economy, the intellectual capital has become more important in adding value when compare to physical asset (Maditinos et al., 2011; Yalam and Coskun, 2007).

7.2 Contributions of the Study

This section presents the contributions of this study, focusing theoretical, methodological and practical implications. An important contribution of this study is the introduction of Nigerian companies' intellectual capital efficiency features to the field of intellectual capital studies. It is a significant contribution in many ways to the field of intellectual capital, especially in the developing countries. Most researchers on intellectual capital paid great attention to the developed countries. Very few studies have emerged from developing countries generally and Nigeria in particular. Empirical evidence shows that the understanding and development of IC concepts in emerging economies is still very much in its infancy. Thus, this study contributes to the scanty literature, theory and methodology on IC concepts in the developing

countries. More importantly, several significant findings from this study have confirmed the relationship between intellectual capital efficiency and company performance. Consequently, it is an empirical support of intellectual capital based theory which advanced that the firm-IC resource is three to four times more value-relevant than the tangible resource. This study's finding revealed the efficiency of intellectual capital thus, giving a clue to the management on the need to manage, and nurture their IC in order to get the best out of them for their sustainability. Therefore, this study contributes to the existing literature on intellectual capital by extending the understanding of the role of IC in developing countries.

Secondly, the study provides evidence that human capital is a pillar upon which all other resources of an organization rest on which is in support of previous submissions of Okwy and Christopher, (2010); Pulic (2002) and Stewart (1997). Higher success and profitability of a company might be accomplished by the employees (Okwy & Chritopher, 2010; Stewart 1997). And structural capital needs human capital to be effective and vis-visa (Youndt et al., 2004). Hence, the investments are worthy resources to be invested on by sampled companies. Therefore, this study finding provides evidence that the two VAIC indicators (HCE and SCE) have substantial explanatory power for companies' value creation efficiency.

However, beyond giving evidence on the value creation of IC using Pulic (2000, 2004) VAIC method in evaluating the IC resources of Nigerian companies with workable measurement tools that can be applied to IC components to calculate its efficiency to minimizing the trouble on how to measure the value added of IC in Nigerian companies, and also providing other IC measurement methods that can be used to evaluate IC resource. Although it has been observed that old tool cannot be

used to assess the new measures (IC) leading to the development of new measurement tool (Bontis et al. 1999; Green & Ryan, 2005; Pulic, 2000). These new measurement tools have been discussed in the previous chapter of this study.

In addition, this study focuses on Nigeria rather than a developed western economy which makes the study to be unique. With global prosperity and stability increasingly dependent on emerging economies, there is a need to establish evidence of IC development in different socio-political and economic settings. The result of this study provides and supports the role of IC in creating firm's value suggesting the need of further examination into the relationship between IC in different countries, different economy, where different level of technological advancements may affect the implication for valuation of IC.

Finally, one of the contributions of this study is that the findings from this study might be useful to the policy makers and regulators in making informed decision and formulating policies that will indeed contribute to the bottom line of IC measurement, disclosure and valuation and indirectly help to solve the problem in intellectual capital reporting. This study also serve as basis for future research on IC studies and a guide for evaluating firm's performance.

7.3 Policy Recommendation

This study provides evidence that IC efficiencies are related to company performance. Specifically, findings show that human capital efficiency is related to company performance of the sampled companies. Therefore, in order to improve human capital efficiency, the sampled companies should implement policies that will improve and upgrade their employees' skill and competence especially in the area of training and development and welfare. This may include introduction of in-training programme, and work-related programmes. And also the welfare of their employees should be their priority in order to have quality, qualified and healthy employees at

all time. This recommendation could be applicable to all Nigerian companies. Because the employees of the Nigerian companies can be of world standard in term of quality of the service they can render; so that they can be marketable around the world.

In addition, Nigerian government should follow the move of Malaysian government by enacting HRDF (human resource development fund) Act and establish a body to be in-charge of collecting shares levy from the employers for the purpose of promoting training of employees' in workplace, and administrative of the HRDF like Pembanguan Sumber Manusia Berhad (PSMB) in Malaysia since 1993. This will in return help the Nigerian economy to grow as the employees in the sectors will have the skill in line with the needs of their businesses and industrialization strategy of the country. These will boost the skill and ability of the employees and ultimately better performance will be enhanced. All these measures will provide competent human capital for the Nigerian companies and economic growth at large.

The study further reveals the potentiality of structural capital in adding value to the company. This is a signal to Nigerian companies that investments in structural capital drivers are worthwhile. Therefore, it is important that Nigerian companies should lay more emphasis on policy that will promote and improve the process, structure, culture and norms of their companies. This study suggests that all the policies recommended may be universally implemented as this study cut across 14 sectors in Nigerian economy.

With the significant role of intellectual capital in companies' performance in view, the study justifies the need to draw the intellectual capital standard for measuring and disclosing intellectual capital in financial reports of Nigerian companies. IAS and IFRS may be considered as precedence. Due to availability of information related to

intellectual capital efficiency, potential investors would be in better position to estimate the risk associated with their investment which may reduce borrowing cost and ultimately reduction in weighted average cost of capital for the company. Therefore, NASB should borrow a leaf from developed countries which already have IC report guideline format such as Japanese government's intellectual capital report guideline and Danish Ministry guideline on intellectual capital statement.

7.4 Limitation of the Study

Despite the effort of this study to investigate the relationship between IC efficiency and company performance, the study has a number of limitations. First the study does not cover all the sectors of the Nigerian economy. Currently, there are 16 sectors making up of Nigerian economy, whereas this study only covered 14 sectors. Hence, the findings may not be universally true for all the sectors in the Nigerian economy because the IC practice of financial sector not covered is different from others. Therefore, this study suggests studies that will cover all the sectors in the future. Also, this study covered only six years with 117 companies thus, the empirical results and conclusions drawn from the tests establishing relationship between IC efficiency and company performance should be considered as leading to future study. Also, this study covered only public listed companies. Private limited companies were out of coverage of this study as such the findings of this study may not be generalized to private companies.

Secondly, the study makes use of VAIC method to measure the efficiency of IC components. Future research should make use of other IC measurement tool, from the available suggested methods, to further confirm or reject this study results. Thirdly, the source of data collection in this study is secondary based on IC information on annual reports of the sampled companies, future study can be conducted using primary data source.

Finally, this study assumes the theory of 'Ceteris Paribus'. This theory assumption and the related concept of parsimony are assumed in this study to help convey ideas, and to retain simplicity given to endogenous variable. The IC efficiencies are taken as exogenous holding all the IC efficiencies variables and company performance variables constant. And also any factors that determine the efficiency of IC were excluded in the course of this study because they are beyond the scope of this study. This theory has been used by previous researchers such as Eisner (1992); Gosh and Ostrey, (1997); Lewis and Sappington (1992).

7.5 Future Research

There is no yet a consensus as to the intellectual capital efficiency measurement and model. Therefore, more researches on this topic are needed. Future study may explore more on different parameters of intellectual capital (such as management philosophy, information system, distribution channel, cost of employees' educational qualification) but develop some exhaustive intellectual capital framework usable for external stakeholders as well as internal management to evaluate intellectual capital efficiency of a company, which could be acceptable to International Accounting Standard Board (IASB) for financial reporting.

The intellectual capital efficiency of the financial sector of the Nigerian economy (banks and insurance companies) could be investigated in the future studies. For measurement of intellectual capital, both CIV method and VAIC method could be used and compared with the IC efficiency results of these two methods in future studies. And for better understanding of interconnectivity of the IC components, structural equation modelling and Path least square may be employed for the analysis.

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