

# IJBED

ISSN 2051-848X (Print) ISSN 2051-8498 (Online)

## International Journal of Business and Economic Development



Volume-3

Number-1

March-2015

International Journal of Business & Economic Development is  
an Open Access Journal of the Academy of Business & Retail Management (ABRM)

# International Journal of Business & Economic Development

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# International Journal of Business and Economic Development

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The IJBED is a scholarly and refereed journal that provides an authoritative source of information for scholars, academicians, and professionals in the fields of business and economic development. The journal promotes the advancement, understanding, and practice of business & retail management. Manuscripts offering theoretical, conceptual, and practical contributions are encouraged.

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- Offer academics, practitioners and researchers the possibility of having in depth knowledge and understanding of the nature of business and management practices and.
- Create a forum for the advancement of business and economic development research.

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## International Journal of Business & Economic Development (IJBED)

### Volume 3 Number 1 March 2015

#### Editorial Comments

The current edition of the *International Journal of Business & Economic Development (IJBED)* contains eleven thoroughly researched and scholarly articles. Each paper conforms to the Academy's editorial policy and has been selected with a view to disseminating both applied and theoretical knowledge. The majority of the papers have an economic development focus, whilst others are sector specific with clear implications for both national and regional development. At the Academy we are fully committed to a robust selection process, but we are equally mindful of the fact that an increasing number of contributors carry out research and write in a second or sometimes third language. What follows certainly makes for a stimulating read and affords us an opportunity to reflect upon human endeavours and the challenges and opportunities that exist in this era of globalisation.

The opening paper of this edition is entitled: **An analytical hierarchy process and fuzzy inference system tsukamoto for production planning: a review and conceptual research by Bon and Utami**. The so-called 'Asian Tiger' economies have lead the way in many respects, when it comes to innovation and manufacturing and thus it seems appropriate that this paper explores the crucial part that planning plays in manufacturing optimisation. Clear objectives and definite outcomes are heavily reliant on the crucial decision making role of managers, a fact that immediately makes us aware of a potential variable that will having a bearing on outcomes. This research underscores the importance of management decision making and the way in which the Analytical Hierarchy Process provides an additional tool to ensure positive outcomes. The world of the manufacturing is understandably pre-occupied with the factors of production, with considerable time and energy given over to avoiding the haphazard and minimising risk and waste. Whilst we live in an era of increased automation we cannot afford to ignore the human element that proves decisive in regards to goal setting and whether those goals or targets are achieved within the manufacturing realm.

The general assumption is that computers by their very nature will always approach tasks as they are configured and thus the normal ambiguities and inconsistencies that are integral to human activity are seemingly alien. The Tsukamoto Fuzzy Inference System provides a means of replicating/factoring in situations that impact on effectiveness. To some the idea of being able to: "enable a computer system to reason with uncertainty" might well come as something of a revelation, but in truth this should not come as a surprise as the systems are invariably designed and configured to carry out specific tasks or replicate situations and respond accordingly. Here we are presented with yet another example of human ingenuity and the way in which the inefficiencies that are present in all manufacturing systems can be addressed in a practical and logical manner taking cognizance of internal and external factors. This paper raises some interesting questions, especially about the channels by which those engaged in manufacturing become aware of the potential benefit of new systems and processes. The worlds of academia and business are often somewhat suspicious and wary of one another, and yet research of this nature reminds us of the value to be gained from ensuring that theory and practice are not allowed to remain the preserve of any particular party. What might benefit Malaysian manufacturing would surely prove a boon elsewhere.

For the second paper we move from Asia to Central Europe. **Innovative activity in chosen branches of tertiary sector in the Czech Republic** by Jirásková is a timely reminder of the centrality of innovation to development. 'Adapt to survive' has long been integral to business, as well as human development. This paper makes a powerful case not only for the

innovation that is so important to continued commercial success, but interestingly explores the value added that can result from protecting intellectual property. The service/tertiary sectors has traditionally been extremely slow to recognise the importance of protecting intellectual property and as a consequence has appeared to lose out on the additional revenue streams that could accrue from taking the time and trouble to secure appropriate legal protection. With economies such as that of the Czech Republic seeing a marked increase in the growth of the service sector it is personally reasonable to see this as an area with considerable potential. That said, the point is well made here that the tertiary sector is diverse and often nebulous in nature and thus intellectual property opportunities are not always as clear as they are elsewhere. Research and development has been shown to be a significant contributor when it comes to improved GDP, yet there would appear to be an ignorance or reticence when it comes to securing legal protection and safeguards.

This research also underscores the disparities between the regions and provides some future areas of focus, especially when it comes to official policy and the support that should be provided to small and medium sized businesses across the Czech Republic. The size of an organisation is clearly significant, a fact that would be universal in this regard. As I read this fascinating piece of research I also found myself wondering whether there is a natural reluctance to engage in endeavours that involve either lawyers or patent offices as these may be perceived as costly, bureaucratic or superfluous to the nature of the core business. In noting that there is poor communication between the scientific community and business sector the author of this research reminds us that there needs to be far greater engagement at every level. Furthermore companies need to view intellectual property with far greater seriousness, not only when it comes to protecting brands and logos, but also with a view to securing additional income streams, something which after all is crucial to the bottom line and long term viability. In the light of this there are some serious questions to be asked of business schools and the courses they offer and whether they are doing enough to highlight this important issue.

The issue of energy, especially in much of the developing world is one that exercises citizens to a considerable degree. So heated has the debate about energy security and the price of energy become in some parts of the world that it generates sufficient hot air to almost become an alternative energy source in itself. Joking apart, this is a serious issue, one that is worthy of further analysis and where possible practical solutions that will help move matters forward in a constructive manner. It is therefore fitting that for our next paper we have one entitled: **Impact of deficient electricity supply on the operation of small scale businesses in North East Nigeria** by **Ado** and **Josiah**. As the economic powerhouse of West Africa there is enormous irony in the fact that a nation that is rich in oil, gas and renewable has become synonymous with power shortages and a general mismanagement of these vital resources.

This study refers to the fact that Nigeria has been dubbed a 'generator economy', something that reinforces perceptions of 'us and them'. The wealthier, along with larger corporate entities can afford alternatives, albeit expensive ones, yet this is not an option for micro, small and medium size entities. The time and money lost through power outages begs serious questions about recent policies, it also calls into question those in leadership roles who are charged with resolving the current situation. The energy deserts that emerge, especially outside the main urban areas face a multiplicity of challenges and we have seen in the more remote parts of the north of Nigeria a general lack of employment opportunities and development has fuelled a general disaffection that has acted as a veritable recruiting sergeant for Boko Haram with all its nefarious activities.

This study provides some useful evidence that helps in the wider appreciation of the challenges being faced. Whilst larger corporate entities are able to factor power outages into



their costs for small companies this is simply out of the question. This is not only a tragedy for Nigeria with its considerable potential, but also plays a part in the continued negative perceptions amongst foreign investors with regard to investing outside the major metropolitan areas. The additional costs caused by power outages are such that this issue continues to rank in the top three of primary concerns for small businesses across Nigeria and further afield. To have nearly 28% of respondents reporting that they have 16 days or more a month without electricity is truly shocking and raises questions about whether this issue is seriously being address at a national and state level or not. Whilst the author is quite right to suggest that the Government needs to consider this issue, it might have been useful to have some key pointers as to how things can be moved forward, especially when it comes to assisting those with greatest need.

**Auchter's paper: Supply chain responsibilities and the need for an integrative ethic management in Emerging Economies** is a highly original piece of research that is worthy of as wide a readership as possible. For those espousing ethical business here we have a paper that challenges head on some of the excepted norms, and uses powerful evidence to elucidate some of the unsavoury practices that are sadly a feature of aspects of globalisation. In this masterly exposé (albeit from an objective and scrupulously academic point of view) of the Sumangali Scheme we gain an insight into some of the unethical activity that exists within the textile and clothing sector in Tamil Nadu, India. The issue of supply chains is a pivotal one for complex supply chains can result in a blurring of lines when it comes to responsibilities, inspection, and enforcement. The unscrupulous happily exploit confusion or seek to take advantage of geographical distance and the absence of clarity that is all too often a feature of the arrangements that exist. One own needs to think of the 2013 horse meat scandal in Europe that was the result of a combination of factors, chief amongst them being a major breakdown in the traceability of the food supply chain mechanism, greed and a failure of regulatory frameworks. Laws and Codes of Practice are all very well, but all too often we see companies and organisation merely following the letter rather than the spirit of the law.

Auchter makes a particularly salient point when he writes of the challenge faced by organisations in; "identifying the standards by which they should govern themselves." Ethical relativism certainly manages to muddy the waters still further. Societal norms and expectations, especially in regard to women and children raises a whole raft of questions that some prefer to shy away from for fear of being accused of cultural imperialism. To its credit this masterly work presents in 3.4 Ethical Judgment (Rules of Thumb) a powerful series go guidelines that not only explain the complexities with great lucidity, but also proffers a practical approach that contains means of negating some of the current flaws that are blighting lives and sullyng reputations. Whilst this research takes Southern India as its primary area of focus it needs to be remembered that responsibility lies with a wealth of stakeholders, not least with the potential consumers of goods produced by those working as part of the Sumangali Scheme.

The fifth paper of this edition is entitled: **The role of diversification in the economic development for oil-dependent countries - the case of the UAE** by **Ahmed**. By almost any economic yardstick the progress made by the UAE is remarkable. As this paper makes clear both in its title and its analysis the driver for this growth has been oil, although local and external observers also note that having a vision has also been integral to the progress made. The role of vision must not be under estimated, especially in an increasingly uncertain and to some extent uncertain world and thus it is interesting to note that yet again the UAE is setting its store by working towards what is called VISION 21. Grand plans of this nature are not solely the preserve of cash rich nations that enjoy extensive sovereign wealth funds, but it is evident that there is a realisation that the UAE must plan ahead to balance its economy so as to protect itself from oil price fluctuations and the fallout from regional instability. It would be interesting to

know whether the rulers of the UAE have a specific vision or whether they have looked for inspiration from countries such as Malaysia and Singapore.

The author furnishes the reader with some fascinating data that helps the general understanding of the key elements of the economy, that said, for all the apparent success and forward planning it is evident that issues such as food security and a reliance on vast numbers of low paid foreign workers to do many tasks are issues that are a part of the equation and cannot be ignored. The move towards manufacturing is significant, especially as the UAE's strategic location and the fact that it is a key transport hub helps in this regard. Tourism too has proved remarkably successful, although there are plenty who would question the long term development value of certain vanity construction projects. Developing a knowledge-based economy, investing in Research & Development and ensuring Intellectual Property is registered and championed all help in the recalibration. Table (3-8) - UAE current standing (2013-2014) makes for particularly encouraging reading, although we would do well to note that these judiciously selected statistics have been compiled by none other than the Emirates Competitiveness Council in Dubai. That said, it would be churlish to deny that a remarkable transformation has taken place and there are clearly lessons that other oil dependent countries can learn from what the UAE has achieved to date and is working towards for the future.

There is an old adage that says: "There are two things we cannot avoid, death taxes". If we reflect on this for a moment it summarises the natural fear or resentment concerning revenue collection and the general antipathy that people have towards it. We would do well to explore some of the reasons why there is a universal resentment about taxation; invariably this stems from a perception (rightly or wrongly) that a disproportionate amount of taxation is being taken, that it is not being well spent or that in some way taxation represents a form of near State authorised theft of hard earned cash. There is a whole range of issues with regard to fairness, the ability to pay, tax avoidance and tax evasion. One thing is for certain, taxation whilst it may be seen as evil by many, it is a necessary evil.

The thorny subject of taxation is at the heart of the next paper: **Correlates of state government finances and the Nigerian economy** by **Imegi**. This paper enables the reader to gain a better understanding of the Nigerian context, especially in regard to the national government and state governments. The complex relationship between these two elements of Nigerian society adds to the challenge in regard to revenue collection. Efficient revenue collection relies on the social contract, one which in Nigerian society is only slowly beginning to evolve. As things stand whilst there is evidence of an appreciation of the complexities that bedevil revenue collection the issues of trust, burden sharing and transparency are ones that are paramount. Revenue collection can be difficult at the best of times, but when various entities are involved then the potential for mistrust is significantly increased. Countries across the African continent are endeavouring to increase their tax take as this is perceived as instrumental to continued development. Anyone who has read; *For State & Citizen – Reforming Revenue Administration in Burundi* (Africa Research Institute, October 2013) will appreciate that whilst a genuine challenge exists, progress is indeed possible.

This paper makes clear that in Nigeria revenue gathering mechanisms do exist, but that they are overly complex and are sometimes viewed as being unjust or poorly applied. The existing fiscal architecture is often viewed with a somewhat jaundiced eye and when seemingly competing revenue structures are part of the mix there is potential scope for confusion, resentment and conflict. The shadow of history is evidently never very far away when it comes to attitudes and the prevailing mindset, yet it would appear that there are cautious grounds for optimism. Just as the economy is slowly beginning to be restructured so as not to be entirely dependent upon oil revenues, so fiscal mechanisms are being realigned in such a manner as to

offer some hope that they will gradually become more effective. The recent national election should serve as a reminder to the world that whilst Nigeria has its problems, it is more than capable of finding a way forward when there is a collective desire for positive and purposeful change. A later paper in this publication by Ironkwe and Peter provides some fascinating insights into Value Added Tax (VAT) in Nigeria, especially with regards to implementation, effectiveness and the division of revenue between federal and state authorities.

The seventh paper of this edition is entitled: **Operating revenue changes in a demutalized stock exchange** by **Abdel-Hafez**. Few aspects of globalised business operation have undergone such radical change and daily scrutiny as have the various stock exchanges around the world. Technology has had a dramatic effect, so much so that in many respects trading as it was once known has disappeared.

This paper charts the rapid move towards demutalization driven by increased competition and it is interesting to see that no aspect of business has been immune to change. As well as making a varied selection of seven stock exchanges to compare (ranging from Malta Stock Exchange to the New York Stock Exchange) this research benefits from an extensive literature review that helps anchor the readers understanding. It would have been interesting to hear why the selection of exchanges was made, I assume that it was not random and was an attempt to include small, medium and large exchanges with a view to giving a balanced perspective. Such is the dynamic within this area of trading that it is often difficult for laymen and women to keep up with developments. That said, some interesting findings are revealed here especially in regard to income generation through fees etc. The intense competition has driven mergers, acquisitions and alliances between stock exchanges, something that in some respects what has happened in global aviation, an example of this is the fact the London Stock Exchange Group owns the Borsa Italiana along with MillenniumIT (whose Millennium Trading platform is the world's fastest). All of this, activity as the author makes clear, is a world away from the mutual society status that was often a part of the origins of many stock exchanges.

Our next paper returns us to West Africa, with a detailed analysis of taxation and its possible impact on a key industry. **Value Added Tax and the financial performance of quoted agribusinesses in Nigeria** by **Ironkwe** and **Peter** seeks to elicit the degree to which VAT impacts on the profitability of seven publicly listed companies. It is extremely rare for individuals or sectors to actively embrace a form of taxation and it should come as little surprise to any of us that agribusiness in Nigeria are no exception. As a key industry it is keen to be exempt or given certain incentives or tax breaks as a means of stating its claim to be addressing the issue of food security and potentially providing goods for export regionally and further afield. VATs introduction in Nigeria emulates the British model and this thorough overview and cogent analysis of this particular fiscal mechanism makes for an interesting read. A particularly telling line is; "An important challenge to administering VAT is the nature of the Nigerian business environment." - a fact underscored by the general paucity of record keeping amongst many corporate concerns.

I note with interest that the paper appears to assume that those engaged in business are all male, a point which in my experience of Nigeria is patently not the case. By choosing companies that are listed on the Nigerian Stock Exchange by its very nature this research is self-selecting, for the requirements of such listing mean that companies are required to conform to certain established norms. Thus it is reasonable to assume that in non-listed companies the situation could well be markedly different, especially when it comes to accurate record keeping and adherence to the requirements in regard to VAT. That said, whilst we can assume that record keeping might well be weaker in non publically listed companies, there will always be some that are doing an exemplary job and hence we must be wary of assuming that larger

automatically means more compliant. Whilst no business welcomes another layer of taxation and all the work that goes with it, this research appears to have found that whilst VAT does have a negative impact in the scheme of things this negativity is small compared with other factors. We only need to reflect on infrastructural challenges and the power outages examined in an earlier paper and we can appreciate that this point is well made. Whilst VAT may well be resented by businesses in Nigeria since it was first introduced in 1994 it has at least become a familiar part of the fiscal landscape with businesses being required to make monthly VAT returns and payments at their local VAT office. The recommendations made by the authors of this paper are in themselves interesting, balancing the need for more accurate record keeping by agribusinesses with the need for the authorities, namely the Federal Government to consider certain incentives that will assist a key sector.

The apparent triumph of Western capitalism and the theories that underpin it has shaped the prevailing economic orthodoxy for some considerable time. Whilst the Western model appears to have gained near universal acceptance, it is worth noting that there are some cultures and countries that appreciate that unfettered capitalism comes at a price, both economically and in regards to well-being. The ninth paper in this edition is entitled: **The relationship between the understanding of philosophy of sufficiency economy and the living standard: the case study of sufficiency economy community in lower north region of Thailand** by **Wanasilp and Tangvitoontham** provides a South Asian perspective on the challenges faced by communities endeavouring to adapt post a period of severe economic downturn. Crises, particularly those of a prolonged nature often result in a degree of reflection and introspection.

The authors of this paper explain that the Financial Crisis of 1997 had a deep impact on Thai society and as a result there was a desire to find a means of understanding societal needs, especially in regards to core values. Where some might look to spiritual leaders or theorists for direction, the Thais with their deep reverence for the Thai Monarchy looked to his pronouncements and has taken them as guiding principles. These principles help form the Philosophy of Sufficiency Economy (PSE) with as the authors' state; "...sustainable development through the practice of reasonableness, moderation and self-immunity by people of all walks of life." These guiding principles are very much in keeping with the tenets of Buddhism, a fact that is surely significant as 95% of Thais are practicing Buddhists. Here we see echoes of E. F. Schumacher (1911-1977) the author of the seminal work *Small is Beautiful - Economics as if People Mattered* (1973), he was a man who espoused and championed what he called Buddhist Economics. This emphasis on quality of life also reminds one of the approach taken by the Himalayan kingdom of Bhutan that has a national policy of measuring progress by Gross National Happiness.

A growing body of literature has begun to emerge in recent years that explores alternative approaches, which whilst not exactly utopian in nature do at least endeavour to factor in values that some might dismiss as quaint or in some way incompatible with the standard capitalist approach. This study certainly provides some food for thought and whilst there will always be those who take a somewhat sceptical viewpoint, it is evident that there is indeed merit in such research and paper such as this make it clear that it deserves a decent hearing.

The penultimate article in this edition is entitled: **The new determinant creation theory a way to attract new foreign direct investment flows** by **Botello and Dávila**. Traditionally growing an economy was all about local activity and the productivity that resulted. In the era of globalisation a major driver of growth and economic development is the constant quest to attract and retain foreign direct investment (FDI) as this brings with it not only precious capital flows, but also new practices and connections that can yield substantial dividends for the host country.

Building on an extensive literature review the authors of this paper seek to examine the key drivers when it comes to successfully attracting FDI and by examining the recent Mexican experience formulate a theory/mechanism that offers a means to optimise existing knowledge and ensure that it remains fit for purpose. One of the central observations they make is as follows: "The advance of global knowledge has become itself as an attractive determinant to catch the attention of investors.", this point is well made and hence it goes some way to explaining the emergence of knowledge clusters such as Silicon Fen (UK) and the Hague Security Delta (HSD).

Naturally states and regions will have their unique selling points and priorities and thus it is important to have an understanding of the local dynamic whilst at the same time fitting this into the national picture. One area that I felt Botello and Dávila could have explored is the role played by perception/misconception and reality, some nations are perceived for some certain qualities, for example Germany is invariably associated with efficiency, others might be viewed in a rather more negative light and this becomes a nature impediment when it comes to attracting FDI. This research certainly reiterates the importance of "the creation and renewal of key determinants" and in so doing has some useful pointers for other regions and countries seeking to optimise their position with regards to FDI. Mexico is evidently doing something right as according to UNCTAD's *World Investment Report 2014* it came in a very respectable 10<sup>th</sup> place in the list of recipients of FDI pulling in a very respectable \$38 billion. This paper underscores the importance the FDI continues to play in economic development.

Our final paper is entitled: **The role of information communication technology (ICT) in enhancing productivity in local government in Benue State, Nigeria** by Teryima and Sunday. We would all do well to reflect for a moment on the extraordinary impact that ICT has had on our lives over the last couple of decades, then let us imagine some of the challenges that can thwart our fast and efficient use of such technology. Benue State and its 4,000,000 plus citizens has also benefitted by the progress that new technology has brought, yet this paper makes clear that there is room for substantial improvement. In choosing to focus on ICT in local government the authors have managed to highlight both the opportunities that are available, as well as the issues that are cause of frustration or indeed failing.

The fact that this study chooses to quote Griffins (1997) and the Characteristics of Useful Information is itself of interest, for whether we are students or working in the public or private sector, we are all faced with a veritable tsunami of information that presents us all with an immense challenge. Where Griffins highlighted the importance of information being: Accurate, Timely, Complete and Relevant, and yet one of the skills seems completely missing from our information saturated world is that of discernment.

We have heard in previous research that power outages are a major cause of concern in Nigeria and thus it is inevitable that this would result in inefficiencies in local government, but it is evident that there are legitimate concerns about adequate funding mechanisms, technical competency, up to date equipment and cyber governance. In addition one thing that the paper did not explore is the fact that many of those who now occupy positions of influence were educated in the pre-ICT age and thus have a different mindset, one that almost certainly has negative consequences when it comes to identifying, prioritising and championing the ICT needs of the local government sector in Benue State and elsewhere. This paper is a timely reminder that development can easily be impeded if officials and public servants are not given the appropriate tools, training and knowledge to do their job.

These papers remind us that business and economic development is always a work in progress and yet there is much here that provides grounds for optimism, but what is more is

proof of mankind's ingenuity and desire to seek to grow and benefit from the interaction with the wider world.



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**International Journal of Business & Economic Development (IJBED)**  
**Volume 3 Number 1 March 2015**  
[www.ijbed.org](http://www.ijbed.org)

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# An analytical hierarchy process and fuzzy inference system tsukamoto for production planning: a review and conceptual research

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## Keywords

Production planning, Analytical Hierarchy Process, Fuzzy Inference System Tsukamoto

## Abstract

*Production planning is an area that is very important on the corporate strategy-level decision-making, especially in the manufacturing companies. The problems that often arise in the production planning are the factors that affect the decline of production and uncertainty that often complicate the decision-making in the production process. These factors are derived from the company's internal and external factors. The purpose of this study is to introduce the Analytical Hierarchy Process as an effective method that can help to determine the priority of the production factors, so as to facilitate and accelerate decision-making. Other than the AHP methods, this paper will introduce the Tsukamoto Fuzzy Inference System as a method that can help to determine how much product to be manufactured by the company using the variables in the form of fuzzy numbers. These methods hopefully can assist in a better decision making process in the production process and manufacturing generally.*

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## 1. Introduction

Production planning is compulsory in manufacturing enterprises. Production planning is a tactical planning that aims to give a decision, based on the company's resources in order to meet customer's demands [1]. Production planning function in making sure everything necessary to make the product is available, and in accordance with the specified schedule beforehand. Planning the production of a product can be tricky, because it requires cooperation between several functional units within the company [2]. Production managers play an important role in production planning. One of the tasks of the production manager is as a decision maker to determine how much product will be produced.

Each company is generally established with the aim to gain profit and maintain its viability. In an effort to maintain its existence, every company will do its best to meet customer's demands. However, in meeting those demands, often a company faces various problems. One of it is the uncertainty in factors of production planning [6]. Uncertainty can be categorised into two types which are environmental uncertainty and uncertainty of the system. Environmental uncertainty refers to the uncertainty that would be beyond the scope of control of the production process, such as demand and supply uncertainty. While the system uncertainty refers to the uncertainty associated with the production process, such as production uncertainty, uncertainty of production time, quality and production failure [3,4].

Uncertainty that occurs normally comes from the factors of production within the company. Factors of production themselves can be divided into two, which is internal and external. Internal production factors are factors that are directly related to the production processes such as capital, labour, technology and raw materials. While external factors are the factors of production that are not directly related to the production process, such as inventory, suppliers and market demand [5, 7].

Production planning practitioners are usually aware of the problems they face in determining the amount of production. It is common for them to confront uncertainty in many factors of production. One of the cases that are often encountered is the presence of an excess or shortage of production facilities and production output. This case happens on a regular basis in the enterprise and always has a direct impact on the cost of production and storage, as well as profits.

In order to facilitate the decision-making process in production planning and provide a basis for future research, some researchers use variety of methods to resolve the problems of uncertainty in many fields, such as research [4] which is decomposed in the table 1.

<b>Conceptual models</b>	<b>Analytical models</b>
Yield factors	Hierarchy process
Safety stocks	Mathematical programming (LP, MILP, NLP, DP, and MOP)*
Safety lead times	Stochastic programming
	Deterministic approximations
<b>Hedging</b>	Laplace transforms
Overplanning	Markov decision process
Line requirements planning	
Flexibility	
<b>Intelligence artificial based models</b>	<b>Simulation models</b>
Expert system	Monte Carlo techniques
Reinforcement learning	Probabilistic distributions
Fuzzy set theory	Heuristic methods
Fuzzy logic	Freezing parameters
Neural network	Network modelling
Genetic algorithms	Queuing theory
Multiagent system	Dynamic systems

\* LP = linear programming; MILP = mixed-integer linear programming;  
NLP= nonlinear programming; DP= dynamic programming; MOP= multi-objective programming.

Table 1. Classification for the general type of uncertainty models in manufacturing system

Table 1 shows the methods that can be used to cope with the uncertainty. All of the listed models and methods starting from the conceptual models down to simulation models are widely used to deal with the uncertainty in the manufacturing system. All of these models are established to make it easier for practitioners in the company to overcome the uncertainty. For the purpose of model development in the field of production planning, this paper proposes two methods to be presented as a means of decision-making process on complex issues and a lot of uncertainty. The methods that this paper emphasises are firstly, the analytical hierarchy process and secondly, the fuzzy inference system Tsukamoto.

This study will discuss the previous literature review and only introduce to the audience with some of the research related to the production planning, as evidence that there has been much development of the methods to help companies achieve their targets.

## 2. Analytical Hierarchy Process

AHP is a method that was first introduced by Thomas L. Saaty, a mathematician from the University of Pittsburgh, USA in 1977. He successfully developed the AHP method to solve the problem of decision-making in 1980 [8, 9, and 10]. AHP is a simple and flexible decision-making method that can accommodate creativity in the design of a problem. This method is also designed to solve the problem of multi-criteria decision-making (MCDM) which has been proven to be very effective in analyzing complex problems. With AHP, complex problems can be systematically arranged in a hierarchical relationship [13, 12]. AHP analysis intended usage is to create a model of unstructured problems and is usually applied to solve problems of scalable and those that require opinion (judgment). AHP includes qualitative and quantitative aspects of the human mind [12, 13]. Qualitative aspects define the issue and hierarchy while the quantitative aspects express assessment and preferences concisely. Therefore, AHP requires assessment on respondents of the study who is expert in decision making.

According to Saaty [13], AHP can be used for decision-making such as: setting priorities, generating a set of alternative, choosing alternative, choosing alternative best policy, establishing various requirements, allocating resources, predicting outcomes and assessing risks, measuring achievement, designing the system, planning and solving conflicts. Based on [12], many outstanding works have been published based on AHP. It included the applications of AHP in different fields such as planning the best alternative, resources allocations, resolving conflicts, optimisation, investment decisions and sosial-economics planning. In any case of prioritization, AHP is often used as a tool. As in the study done by Kardi Teknomo [19] using the AHP as a method for making the selection decisions for campus transportation, Doraid dalalah *et al.* [20], in a study he was using AHP to analyse the selection of cranes, Debmallya Chatterjee *et al.* [21] also using AHP as a method of decision-making in the selection of the best banks in India. While Fashiar [22], applying a multi-criteria AHP on an ergonomic approach, to select the best material heandling.

Nowdays, so many researchers are trying to combine the AHP method with other methods to solve problems. Thus, many studies created a combined AHP with different versions and the studied problems also varied. Merging is done in order to achieve better results. Merger is also done for developing the models of the AHP method. Yusuf [23], has been combining AHP with Goal Programming Program as a model to determine the best supplier. Meanwhile, Rezaie *et al.* [10], combined AHP with DEA (Data Envelopment Analysis) to determine ranking of the intelligence of parameters for people with epileptic. In addition, another example for the development of the AHP method, such as Hidayat *et al.* [24] which uses a model FAHP (Fuzzy Analytic Hierarchy Process) to identify risks and develop strategies of the palm oil supply chain. The investigation of this model is used to determine the interest rate risk to the supply chain actors.

In the development of AHP, it is still rarely used for decision-making in the field of production planning, especially in Malaysia. This paper is intended to introduce the AHP model in the production planning to be applied in Malaysia. Many production problems can be solved by the AHP model, such as production problems that caused a decrease in the amount of production. By using AHP, priority of the factors that influence it will be sought, so it can look for the appropriate solutions to minimize their impact. To obtain a rational decision by using AHP, basically there are several steps that need to be considered using this method, among others:

1. Defining the problem and determining the desired solution.
2. Creating a hierarchical structure that begins with a general purpose, followed by the criteria and sub-criteria.
3. Establishing pairwise comparison matrix that describes the relative contribution or influence of each element on each level objectives or criteria above. Comparisons are made based on the judgment of a choice or decision-makers by assessing the level of interest of an element compared to other elements.
4. Normalising the data by dividing the value of each element in the matrix paired with a total value of each column.
5. Calculating eigenvalues vector and tested for consistency, if not consistent then the data (preferences) should be repeated.
6. Repeating steps 3, 4, and 5 for the entire level of the hierarchy.
7. Calculating eigenvector of each pairwise comparison matrix. Eigenvector value is the weight of each element. This step synthesizes choice and prioritization of the elements at the lowest level of the hierarchy to the achievement of objectives.

- Test the consistency of the hierarchy. If it does not comply with  $CR < 0.1$ , the assessment should be repeated again.

To determine the factors that affect the priority of the decline in production quantities, the first thing to identify is the criteria for the study from literature or to find out directly from the company. From the conducted literature study, there are two types of factors found: internal and external. The internal factors are divided into capital, labour, technology, and raw materials. While external factors such as inventory, suppliers and market demand. The next step is to create a hierarchical structure. In the hierarchical structure it is necessary to determine the goal you want to target, criteria and sub-criteria, such as:

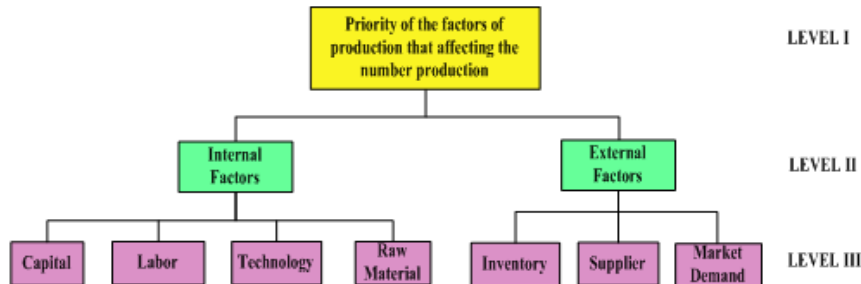


Figure 1. The concept of hierarchical problem solving priority factors of production

Explanation :

Level I : Goal

Level II : Criteria

Level III : Sub-criteria

After creating the hierarchy, the next step is to create a questionnaire with the goal is to determine the respective interests of the top level then performed pairwise comparisons between criteria and sub-criteria. Questionnaires were distributed to a sample that is usually a team of managerial and production manager of the company who knows quite well the ins and outs of production of the company. Scale used by Saaty scale, such as:

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Weak importance of one over another	Experience and judgment slightly favor one activity over another
5	Essential or strong importance	Experience and judgment strongly favor one activity over another
7	Demonstrated importance	An Activity is strongly favored and its dominance demonstrated in practice
9	Absolute importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values between the two adjacent judgments	when compromise is needed
Reciprocals of above	If activity i has one of the above nonzero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i	A reasonable assumption
Rationals	Ratios arising from the scale	If consistency were to be forced by obtaining n numerical values to span the matrix

Table 2. Saaty scale pairwise comparisons [30]

The next step after getting the results from the questionnaire is to establish a comparison matrix such as:

	$A_1$	$A_2$	...	$A_n$
$A_1$	1	$a_{12}$	...	$a_{1n}$
$A_2$	$a_{21}$	1		$a_{2n}$
⋮	⋮	⋮	⋮	⋮
$A_n$	$a_{n1}$	$a_{n2}$	...	1

Figure 2. Pairwise Comparison Matrix [30]

A  $n \times n$  matrix is a reciprocal matrix, which is assumed that there are  $n$  elements  $w_1, w_2, \dots, w_n$  that make up the comparison. Values are pairwise comparisons between  $w_i, w_j$  presented in a matrix  $w_i, w_j = a_{ij}$  with  $i, j = 1, 2, 3, \dots, n$  while the value of  $a_{ij}$  is the value of the comparison matrix that reflects the value of the respective interests of  $A_i$  to  $A_j$  in order to obtain the matrix normalized. Value of  $a_{ij} = 1$ , for  $i = j$  (diagonal matrix has a value of 1), or if the operating elements of  $A_i$  with  $A_j$  have the same interest rate, the value of  $a_{ij} = a_{ji} = 1$ . When the elements of the weighting vector operations expressed by  $W$ , with  $W = (w_1, w_2, \dots, w_n)$  then, the intensity of the interests of the operating elements  $A_1$  to  $A_2$  is  $= \frac{w_1}{w_2}$ , so the pairwise comparison matrix can be expressed as follows:

	$A_1$	$A_2$	...	$A_n$
$A_1$	$w_1/w_1$	$w_1/w_2$	...	$w_1/w_n$
$A_2$	$w_2/w_1$	$w_2/w_2$		$w_2/w_n$
⋮	⋮	⋮	⋮	⋮
$A_n$	$w_n/w_1$	$w_n/w_2$	...	$w_n/w_n$

Figure 3. Pairwise Comparison Matrix [30]

After getting the results of pairwise comparisons, then the next step is to normalize the data. Normalization of data is done by the following formula:

- a. Summing the values of each column in the pairwise comparison matrix, the total value of the column is denoted by  $S_{ij}$

$$S_{ij} = (\sum_{i=1}^n a_{ij}) \tag{1}$$

Explanation:

$S_j$  = Total value of the column

$a_{ij}$  = Element in row  $i$  and column  $j$

$i, j = 1, 2, 3..n$

- b. Dividing the value  $a_{ij}$  in each column with the number of values in a column, the result of the division is denoted by  $VE_{ij}$

$$\left( VE_{ij} = \frac{a_{ij}}{\sum_{i=1}^n a_{ij}} \right) \tag{2}$$

Explanation :

$VE_{ij}$  = Normalized Comparison Matrix Pairewise

$S_j$  = Total value of the column

$a_{ij}$  = Element in row i and column j

$i, j = 1, 2, 3, \dots, n$

- c. Calculating the relative priority vector of each criterion by summing all the values of each row of the matrix has been normalised and dividing by the number of elements of each row i. Priority criterion i is denoted by  $P_{ij}$  matrix has been normalized and denoted by  $M_i$ .

$$P_{ij} = \sum_{i=1}^n \frac{M_i}{n} \quad (3)$$

Explanation :

$P_i$  = Value Eigenvector Normalisation (Factor Priority)

$M_i$  = Number of rows matrix normalisation

$n$  = Number of factors / criteria

Eigenvector value is the weight of each element. This step synthesises choice and prioritisation of the elements at the lowest level of the hierarchy to the achievement of objectives. If it is known elemental ratios  $A_i$  with  $A_j$  is then theoretically the matrix characterised by positive reverse, ie  $a_{ij} = 1 / a_{ji}$ . The weights is expressed in vector  $w = (w_1, w_2, w_3, \dots, w_n)$ .  $W_n$  value stating the weights criteria of  $A_n$  entire set of criteria on the subsystem. If  $a_{ij}$  represents the degree of the interest factor i to factor j, and the degree of interest expressed  $a_{ik}$  of factor j on factor k, then the decision to be consistent, the interests of the k i factor, must be equal to  $a_{ij} \cdot a_{jk}$  or if  $a_{ij} \cdot a_{jk} = a_{ik}$  for all i, j, k. For a matrix to be consistent with the vector  $w$ , then  $a_{ij}$  element can be written as:

$$a_{ij} = \frac{w_i}{w_j} ; i, j = 1, 2, 3, \dots, n \quad (4)$$

so the consistency matrix is:

$$a_{ij} \cdot a_{jk} = \frac{w_i}{w_j} \cdot \frac{w_j}{w_k} = \frac{w_i}{w_k} = a_{ik} \quad (5)$$

from equation (5) above, it can be decomposed into:

$$a_{ij} = \frac{w_i}{w_j} = \frac{1}{w_j/w_i} = \frac{1}{a_{ji}} \quad (6)$$

from equation (6) the following equation can be obtained:

$$a_{ji} = \frac{w_j}{w_i} = 1 \quad (7)$$

Thus for the consistent pairwise comparison matrix the equation is as follow:

$$\sum_{i,j=1}^n a_{ij} \cdot w_{ij} \cdot \frac{1}{w_{ij}} = n ; i, j = 1, 2, 3, \dots, n \quad (8)$$

$$\sum_{i,j=1}^n a_{ij} \cdot w_{ij} = n w_{ij} ; i, j = 1, 2, 3, \dots, n \quad (9)$$

The above equation is equivalent to the matrix equation below:

$$A \cdot w = n \cdot w \quad (10)$$

In matrix theory, this formulation was expressed as  $w$  is the eigen vector of the matrix  $A$  with eigenvalues  $n$ . Note that  $n$  is the dimension of the matrix itself. In the form of a matrix the equation can be written as follows:

$$\begin{bmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \dots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \dots & \frac{w_2}{w_n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \dots & \frac{w_n}{w_n} \end{bmatrix} \cdot \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix} = n \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix}$$

But in practice it can not be guaranteed that:

$$a_{ij} = \frac{a_{ik}}{a_{jk}} \tag{11}$$

Mulyono (2004: 337-338) states if  $a_{ij}$  not based on the exact size as  $w_1, w_2, w_3, \dots, w_n$  but on subjective judgement, then  $a_{ij}$  will deviate from the real ratio of  $w_i/w_j$  and consequently  $Aw=nw$  cannot meet again. But the matrix theory can provide convenience in two ways: First, if  $\lambda = \lambda_1, \lambda_2, \lambda_3, \dots, \lambda_n$  are number that satisfy the equation  $Aw=\lambda w$ , where  $\lambda$  is eigenvalue of matrix  $A$ , and if  $a_{ii}=1$  for  $i$ , then :

$$\sum_1^n \lambda_i = n \tag{12}$$

If  $Aw=\lambda w$  fulfilled, then all eigenvalue equal to zero value, except the eigenvalue is valued at  $n$ . So obviously in the case of consistency,  $n$  is the largest eigenvalue.

Secondly, if one  $a_{ij}$  reciprocal of the matrix  $A$  change very little, then the eigenvalue also will change very little accordingly. The combination of the two explains that if  $A$  diagonal matrix, consisting of  $a_{ij}=1$  and if  $A$  consistent, then a small change in  $a_{ij}$  hold the largest eigenvalue  $\lambda_{maks}$  close to  $n$ , and the remaining eigenvalue close to zero. If  $A$  is a pairwise comparison matrix, then to obtain a priority vector,  $w$  has to looked for that satisfies.

$$Aw = \lambda_{maks}.w \tag{13}$$

The next step is to calculate the pairwise consistency of assessment which has been done. The consistency of the pairwise assessment can be evaluated by calculating Consistency Ratio (CR). Saaty set if the CR value less than or equal to 10% ( $CR \leq 0.1$ ) then the result assessment is said to be consistent. The formulation to calculate is:

$$CR = \frac{CI}{RI} \tag{14}$$

Where, CI = Consistency Index (consistency index) and RI = Random Consistency Index. CI values using the formula:

$$CI = \frac{(\lambda_{max} - n)}{(n - 1)} \tag{15}$$

$\lambda_{max}$  is the maximum value of the matrix eigenvalue  $n$ . Maximum eigenvalues obtained by summing the results of the comparison matrix multiplication with the main eigenvector (priority vector) and dividing by the number of elements. CI values would be meaningless if there is no reference to whether the CI matrix showed a consistent or inconsistent. Saaty provided a reference sample of 500 pieces of random matrices, with a 1-9 ratio, for some order matrix. Saaty [13], to get the average value of the Random Index (RI) as follows:

Size of Matrix	Random Consistency
1	0.00
2	0.00
3	0.58
4	0.90
5	1.12
6	1.24
7	1.32
8	1.41
9	1.45
10	1.49

Table 3. Nilai Random Index (RI) [31]

If the resulting value is consistent, then this means that all of the elements have been grouped homogeneously and the relation between each criterion has been logically justified, then the next value arranged from the highest to the lowest sequence. The factor with the highest value can be said to be a factor that needs to be prioritised.

### 3. Fuzzy Inference System Tsukamoto

Fuzzy Logic is an area of soft computing that enables a computer system to reason with uncertainty. Fuzzy logic was first introduced by Lotfi A. Zadeh in 1965. Basic Fuzzy Logic is the theory of fuzzy sets. In fuzzy set theory, the role of the degree of membership as a determinant of the presence of elements in a set is very important. Degrees of membership function as a major characteristic of the fuzzy logic reasoning. In many ways, fuzzy logic is used as a way to map the problem of inputs leading to the expected output. For instance, warehouse manager told the production manager how much inventory at the end of this week, then production manager will set the number of items that must be produced tomorrow [34]. One example of an input-output mapping in graphical form as shown in Figure 1.3

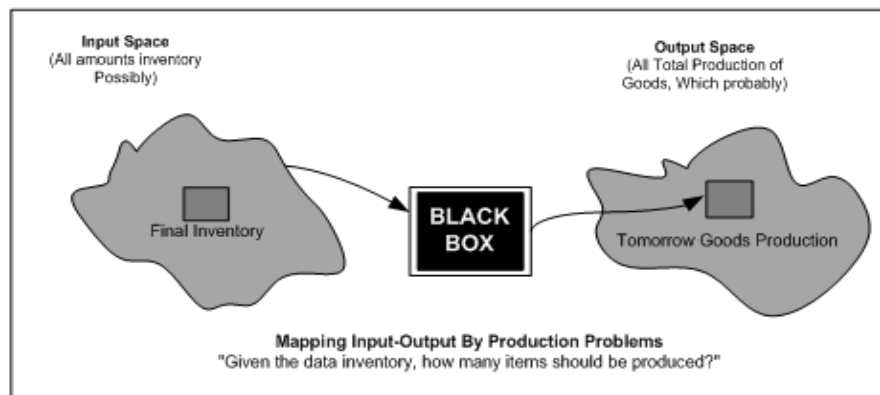


Figure 1.3 Examples of Input-Output Mapping adapted from [35]

Fuzzy logic can be considered as a black box that connects the input space to output space. The black box contains a way that can be used to process data inputs into outputs in the form of good information. One application of fuzzy logic that has grown very broad today is a fuzzy inference system (Fuzzy Inference System/FIS), the computing system that works on the principle of fuzzy reasoning, reasoning like humans do by instinct. An example, the determination of the production of goods, decision support systems, data classification systems, expert systems, pattern recognition systems, robotics, and so on. The Tsukamoto method was first introduced by Tsukamoto, 1979, which is one of the methods of decision-making. This method applies to any used monotone reasoning rule; the intention is to use the system with



only one rule. The implications of each rule in the form of implications; "Cause and Effect" or Implications "Input-Output" in which the antecedent and the consequent has to be related. Each rule is represented using fuzzy associations, with monotonous membership function. Then, to determine the outcome of a firm (Crisp Solution) is used with formulas assertion (defuzzyfication) called "centered average method".

There are 3 steps in using the Tsukamoto method:

1. Fuzzification
2. Inference
3. Defuzzyfication

This formulation is to determine the crisp output value that will be the number of goods produced ( $Z$ ), by changing the input (in the form of fuzzy sets derived from the composition of fuzzy rules) into a number of fuzzy sets in the domain. This is the centered average method equation :

$$Z = \frac{\sum_{i=1}^n \alpha_i z_i}{\sum_{i=1}^n \alpha_i} \quad (16)$$

From the literature study, there are still a few researchers who apply this method for production planning. The few researchers who apply this method is Ginanjar [39]. He applied the Tsukamoto method in the decision support system to determine the amount of production of goods. Tsukamoto method is used to optimise the production number by looking at the data demand, inventory and production of canned food in the month of January 2010 from the results of the calculation method of Tsukamoto, the amount of production is 4500, while the production on the 20th day is of 3000 package only, so the company will experience a shortage of 1500 production of packaging, while inventory at day 20 only 473 packs. Thus on the 20th day of 1027 the company still lack of packaging. This is certainly going to hurt the company, because if the company can not meet the demand of consumers, then consumers are not satisfied with the service of the company and can cause a bad image for the company Then, the research conducted Firmansyah & Firda, similar to that done Ginanjar is to optimise the number of items to be produced. But the studied products are medicine. The results of this study can help the enterprise's production planning and control.

#### 4. Conclusion and Future Research

Problems that often arise in production planning is dominated by the factors of production itself, either from internal factors and external factors. On each of these factors, uncertainty and ambiguity often occur in the processing stage. To reduce the uncertainty in production planning, many researchers have tried to solve this problem. Most of the previous studies focused on the factors of production factors such as labour and so on. Among the factors of production, it is closely related to one another and are equally important in realising the company's production goals. So far there have not been studies that measure the interests among these factors. In accordance with the objective of this study, AHP is introduced as a method which can help measure interest among these factors by determining the order of priority of these factors. This method has been widely used for prioritization and has been proved flexible to complex problems.

In addition, the problem of uncertainty which is no less important in the production, is the uncertainty of the amount of production. Some cases of uncertainty has been successfully sought for a solution by previous researchers. One of the methods used, are fuzzy method which is known as a method that can resolve the problem of uncertainty and ambiguity. Uncertainty

problem is complex because of the number of production usually occurs due to the production manager at a loss to determine the amount of production that is due to the uncertainty of other factors such as the amount of inventory and raw materials. Based on the second objective which is to introduce the Tsukamoto FIS method as a method that can help to resolve the problem of uncertainty. This method can resolve uncertainty by using fuzzy sets. This method is very simple but very effective. This method is still rarely used and applied by researchers to solve production problems. Expected outcome from this paper is to put the attention back on this method while developing and apply it to the production line.

#### Acknowledgment

This research is supported and sponsored by Fundamental Research Grant Scheme (FRGS) Phase 1/2014 Research Vot. 1469, under Ministry of Education, Malaysia.

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## Innovative activity in chosen branches of the tertiary sector in the Czech Republic

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### Key words

Innovation, investment, services, Czech Republic, patent, protection.

### Abstract

*The aim of this paper is to provide a brief overview on innovation in services and their approach to the protection of intellectual property. The submitted article summarizes preparing part of a starting project mostly focused on investment environment. The area of interest is companies providing services in the territory of the Czech Republic. The aim of the project is supporting actions of promoting investment and innovative environment. It is necessary to exactly define innovation in services and to analyze innovative activity first so the aim could be achieved. A partial aim of the project will be finding out whether branches which report higher revenues from innovative activities are actively using the opportunity to patent their service because innovations are closely connected to the protection of intellectual property as well. The described part concerns innovations in selected branches of tertiary sector whereas all the branches which have been registered by Czech Statistical office, because of a validation of application for patent proceeding at least in two examined periods since 1993 are examined. Furthermore a possible dependency between an amount of patents in single regions and an amount of revenues coming from innovative companies to a region.*

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### 1. Introduction

Permanent innovative process is necessary for a successful entrepreneurship because according to Kotler and Armstrong (2004, p. 856), there are two types of businesses: those that change and those that disappear. Markets, competitors, customers, technology, everything around the business is changing. If a company wants to be successful, it must change, too. (Adamska and Minářová, 2014) It is common knowledge that innovative enterprises achieve higher revenues and that is the reason why regions try to attract new and innovative enterprises to their area. The aim of this report is to confirm that the more enterprises in the region innovate, the more income flows. This paper also examines the relationship between the amount of approved patents in chosen branches of tertiary sector and the amount of revenues of innovating enterprises. Finally the report is going to try to confirm a hypothesis saying the more new patents are in the region the higher are revenues of innovating enterprises. The main asset of the report is the identification of minor factors which could affect the amount of revenues.

### 2. The theoretical basis of innovation in services

Since there are many definitions of innovation it will be chosen generally acknowledged one according to the Oslo manual (OECD, 2005) which defines innovation as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. The general definition of innovation is not sufficient for innovation in services since services have certain specifics which affect the character and process of innovation. The main reason is the intangible nature of services which results in more non-technologic character of innovation in services. In general the services innovation is a topic of growing interest for

researchers and policy makers alike. (Miles, 2005, p. 433) There are many approaches to innovations in services. For instance Salter and Tether (2006, p. 4 - 9) divide evolution of thinking about innovation in services from the 1980s to the present day into 4 groups:

- **neglect** – until the 1980s very little research was undertaken on innovation in services.
- **assimilation** – by the early 1980s when the growth of services continued and it was hard to ignore it.
- **distraction** – the middle of 1990s is the primary focus of study by innovation researchers.
- **synthesis** – this approach highlights the increasing complex and multidimensional character of modern services.

Gallouj and Weinstein divided innovation in services into two complementary groups:

- group focuses on analysis of the introduction of technical equipment and systems in services,
- group of studies where the technologist gaze perceives nothing.

To define innovations in services is also necessary to include the fact that their products are often customized to particular client needs and we could often see a close relationship between service firms and their clients. (Miles, 2005, p. 441) Gallouj and Weinstein (1997, s. 537) mention that analysis of innovation in service is difficult to define from two standpoints. On one side, innovation theory has been developed on the basis of analysis of technological innovation and especially for manufacturing. On the other hand, the specific nature of services makes it particularly difficult to measure them by the traditional economic methods.

Based on mentioned above innovation in service could be generally defined as: *any commercialized change which has not been realized in services yet and in most cases is based on customer's needs and it is not technological.*

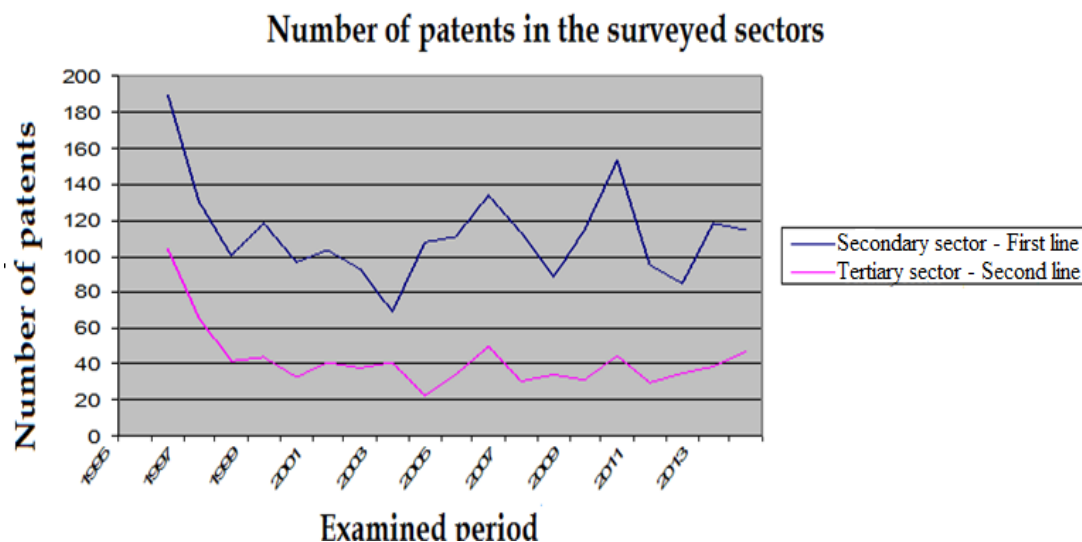
One of the main reasons for focusing on tertiary sector only is:

- its growing importance which has been noticed during last twenty years. (Pazour, 2007, p. 9). It could be said, that in 1990s, a great number of research projects on services innovation were launched.
- service sector participated in the creation of GDP with about 70%.
- the dynamics of the branch.
- less stress on tertiary sector by innovation and by the protection of intellectual property.

It is also important to realize that service sectors are important for their productivity, quality of life and economic competitiveness also.

## 2.1 The protection of intellectual property

Innovations are closely connected with the protection of intellectual property as one of indicators of innovative activities. As mentioned, tertiary sector mainly deals with non-technological innovations which result less number of approved patents. From the figure n. 1 the important difference between manufacturing industry and services by comparing the number of approved patents could be found out. Strongly higher share of the protection of intellectual property in secondary sector is obvious from the first sight during whole monitored period. The same development can be found in utility models and other types of the protection of intellectual property (Statistics of patents, 2014) except of a trademark where can be predicted increasing importance due to intensity of the branch and constantly strengthening competition.



**Figure 1:** Number of patents in examined branches

**Source:** Own processing according to Czech Statistical Office.

Services in the Czech Republic are divided into 16 categories, according to the branch classification CZ-NACE, the same effort to acquire patents cannot be seen in all of these categories. Examined branches and a number of assigned patents see tab. 1.

Examined branch	Number of assigned patents
Information and Communication	5
Financial and Insurance Activities	0
Transportation and Storage and Wholesale and Retail Trade	67
Professional, Scientific and Technical Activities	22
Architectonic and engineering activities, technical tests and analyses	43
Research and Development	99
Other business services	19
Health, community, social and other services	6

**Tab. 1:** Number of assigned patents in examined branches

**Source:** Own processing according to Czech Statistical Office

A contrast in the number of assigned patents in single branches is obvious in tab. 1.

We can say that services are highly diverse and that some areas of services are slow, whereas others are dynamic and open. Most patents were assigned to a section of research and development, followed by transportation and storage, which were examined with wholesale and retail trade. These sectors used more technologies and that is why there is greater need of the protection of intellectual property.

### 3. Methodology

Three hypotheses concerning a patent activity of companies executing their main object of interest in services were expressed. Regressive analysis and correlative coefficient were used to prove the expressed hypotheses.

The first examination concerns possible mutual dependency between a number of innovative companies and an amount of income coming from an innovative activity. By confirming this hypothesis it would be possible to prove that the more a company innovates the higher is the income coming from its entrepreneurial activity.

- *H0: There is not any mutual dependency between an amount of innovative companies in single regions of the Czech Republic and an amount of income coming from an innovative activity.*
- *H1: There is a mutual dependency between an amount of innovative companies in single regions of the Czech Republic and an amount of income coming from an innovative activity. That means that the more companies innovate the higher their revenues are can be proved.*

The hypothesis concerning mutual relationship between a number of approved patents in innovative branches and an amount of revenues of these innovative companies was examined next. By verification of this hypothesis the need for innovation could be proved again if the service enterprise wanted to achieve higher revenues:

- *H0: There is not mutual dependency between a number of approved patents in chosen branches of tertiary sector and an amount of revenues of innovative companies.*
- *H1: There is mutual dependency between a number of approved patents in chosen branches of tertiary sector and an amount of revenues of innovative companies.*

Finally within the framework of examined categories there will be an effort to confirm a hypothesis saying the more patents in single regions company owns the higher are their revenues:

- *H0: There is not mutual dependency between a number of approved patents in single regions of the Czech Republic and an amount of revenues of innovative companies.*
- *H1: There is mutual dependency between a number of approved patents in single regions of the Czech Republic and an amount of revenues of innovative companies.*

Examined hypotheses were spoken because companies in tertiary sector often do not pay enough attention to patent process nor to innovation. The next reason is difficult measurability of innovative process in services. Because of it a size of the protection of intellectual property could be considered as quantitation factor of innovative process in services. If the hypothesis that the more patents were approved in chosen branches the higher revenues were achieved by innovative companies was confirmed that could be an impulse for bigger effort for the protection of intellectual property in tertiary sector. The remaining two hypotheses were expressed for complex analysis of chosen area.

All of the hypotheses were confirmed at the 5 % significance level using regression analysis of unilateral dependence. Regression analysis was chosen since expressed hypotheses compare independent variable and dependent variable. A model equation of simple regression task can be described using equation (1):

$$Y = a + b \cdot x + e \quad (1)$$

where Y is dependent variable,

a is simple term,

b is regression coefficient,

x is independent variable,

e is residual deviation.

The correlation coefficient which determines the relative degree of linear dependence will be examined in single hypotheses as well to express mutual dependency. Correlation coefficient is defined as (2):

$$\rho(XY) = \frac{\text{cov}(XY)}{\sqrt{D(X)D(Y)}} \quad (2)$$

where the numerator expresses covariance and the denominator expresses square root of the product of divergences.

The correlation coefficient is within the limits  $-1 \leq \rho \leq 1$ , where

- $\rho = 0$ , then  $X$  and  $Y$  are linearly independent ( $b=0$ )
- $\rho = 1$ , then  $X$  and  $Y$  the correlation is positive ( $b>0$ , direct linear dependency)
- $\rho < 0$ , then  $X$  and  $Y$  the correlation is negative ( $b<0$ , indirect linear dependency)

### 3.1 Analytical part – verification of given hypotheses

All of the expressed hypotheses were confirmed on the level of significance of 5 % thanks to the regression analysis. The mutual dependency between all the expressed hypotheses was confirmed. It could be said that there is a dependency between:

- The revenues of innovative companies and a number of innovative companies also for better interpretation the regression analysis was supplemented with the correlation coefficient which was 0,71 and that can be considered as medium strong dependency. Also there is stated value of the R-Squared parameter thanks to which is possible to say that the amount of revenues depends on innovative productivity of single companies in 51 %.
- Total revenues of innovative companies and a number of patents in chosen branches of tertiary sector. A mutual dependency can be considered very strong ( $CC=0,85$ ) in this case and can be said also that the amount of revenues depends on the number of patents in examined branches in 73 %.
- Revenues of innovative companies and a number of patents not only in single branches of services (see the hypothesis 2) but also within single regions of the Czech republic. The dependency was measured 0,92 by means of CC, it means it was very strong.

	1. hypothesis	2. hypothesis	3. hypothesis
<b>P-Value</b>	0,0447	0,0286	0,0009
<b>Correlation Coefficient (CC)</b>	0,718382	0,858635	0,927577
<b>R-squared</b>	51,60%	73,72%	86,03%

**Tab. 2:** Correlation analysis

**Source:** Own research. Statgraphics

## 4. Discussion and conclusion

The aim of this article was to confirm possible dependency of sales of innovative companies on the external circumstances like a number of patents or a number of innovative companies. Since all of the three expressed hypotheses were on the significance level of 5 % possible to verify, a conclusion can be made that the more companies try to innovate the bigger their revenues are. Next it can be assumed that the more companies care about the protection of intellectual property the higher are their revenues. The innovation and also patent proceedings can be considered as a driving force of the economy of the Czech Republic. Not only the need of companies for innovating and increasing revenues, also the need for improving innovative and investment environment for potential investors show the results. The Czech Republic was placed on the 19th place of rankings of EU of investment environment and friendly climate for innovation. Looking at the individual categories the Czech Republic can be rated as above average for introducing new high-tech procedures and technologies. Next advantage increasing

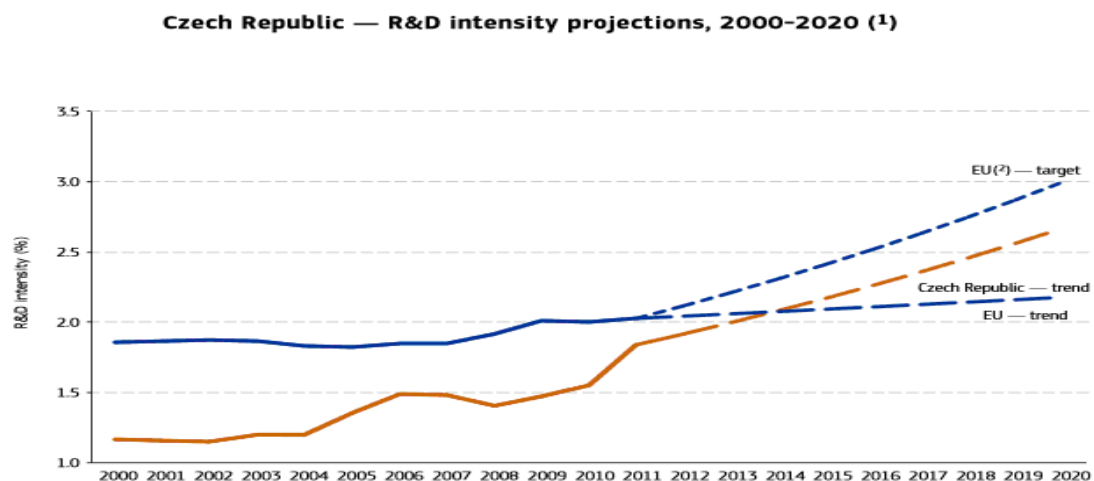


the attractiveness of investment environment for foreign investors is rising quality of graduates. The disadvantages in the Czech Republic are an ability to electrify processes in public administration and worsened ability to mobilize and allocate development capital. (Zahradník, 2013)

Research carried out by the European Commission shows more shortcomings of innovative and investment environment of the Czech Republic. Poor cooperation between scientific community and business sector is stated as the main shortcoming. On the other hand the European Commission proclaims 5 areas (transportation, construction, energy industry a environment) where strong cooperation between scientific outputs and patent applications was noticed (European Union, 2013).

## 5. Limitations of research and the new direction for further research

As mentioned above the shortcomings of investment environment of the Czech Republic could be definitely an object of closer examination. The results found out by this research which shows direct dependency between an amount of revenues and an amount of approved patents or a number of innovative companies could be implemented as well. An effort to attract investors by using various programs concerning innovation is obvious now, that is why I would like to recommend focusing on the oft-repeated protection of intellectual property which is being ignored mostly by service companies. Most patents in the Czech Republic were registered by companies Zentiva and Škoda Auto in the recent years. Both of them are from secondary sector which implies that tertiary sector does not engage in patent proceedings much. To better illustrate the discussed issues it is possible to state the relationship between an intensity of research and a number of innovative companies. Figure 2 shows that the Czech Republic lags behind the European average in the long term. Figure 2 also shows that the Czech Republic could approach the targets of European Union or overcome them even in the future.



**Figure 2:** R&D intensity projection in Czech Republic

**Source:** EUROPEAN UNION, 2013. *Research and Innovation Performance in Czech Republic*. ISBN 978-92-79-30865-9.

## 6. Conclusion

The research mentioned above shows that innovations are positive entrepreneurial impulse and that innovative enterprises produce bigger amount of revenues. The reason for continuing innovative processes should not be only an effort to achieve short-term higher rate of

profits but primarily implementation of innovative strategy to a long-term entrepreneurial plan. The need for continuing innovation comes from a present globalizing world where traditional competitive advantages are becoming more available and forcing society to innovate. A part of this process should be a continuing effort to protect intellectual property. Thanks to these factors, not only an entrepreneurial but also investment environment will improve. (Maskell, 2001, p. 4) As Crescenzi points out (2007, p. 682) the process of making innovation is influenced by many factors in which a traditional amount of investment in primary inputs and also institutional framework for making innovation belong. A part of this innovative process should be not only suppliers but also clients.

Finally, tertiary sector is less innovative than secondary sector (Salter and Thether, 2006), but it should not be a reason to underestimate the innovation process and the subsequent protection of intellectual property.

Since the project dealing with investment environment is in the initial phase it is possible to start an international cooperation. If a research team from abroad is interested in participation on a research, contact us via contact email. The results which come from this article will definitely be a base for further research.

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**Appendices - Documents for the hypotheses:**

## 1. Hypothesis

Regions in Czech Republic	Revenues of innovative enterprises	Number of innovative enterprises
Prague	1256258	2340
Central Bohemia	388281	857
Southwest	216754	1107
Northwest	261560	801
Northeast	248574	1433
Southeast	283566	1894
Central Moravia	244974	1223
Moravia-Silesian	320459	968

## 2. Hypothesis

Selected branches	Whole revenues of innovative enterprises	Number of patents
Transportation and Storage and Wholesale and Retail Trade	353767	67
Financial and Insurance Activities - K /64-66/	361 824	2
Architectonic and engineering activities, technical tests and analyses - M71	13 733	43
Information and Communication - J62	183819	5
Publishing - J58	9 408	12
<b>Czech Republic together</b>	<b>3 220 427</b>	<b>129</b>

## 3. Hypothesis

Regions in Czech Republic	Revenues of innovative enterprises	Number of patents
Prague	1 256 258	813
Central Bohemia	388 281	177
Southwest	216 754	167
Northwest	261 560	90
Northeast	248 574	345
Southeast	283 566	258
Central Moravia	244 974	186
Moravia-Silesian	320 459	164

**Own processing according to:**

*Produktoová inovace* [online]. Czech Statistical Office, 2014 [vid. 2014-06-26]. Available from: [http://www.czso.cz/csu/2014edicniplan.nsf/t/BA00252B56/\\$File/21300314a04.pdf](http://www.czso.cz/csu/2014edicniplan.nsf/t/BA00252B56/$File/21300314a04.pdf)

# Impact of Deficient Electricity Supply on the Operations of Small Scale Businesses in North East Nigeria

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## Key Words

Small Scale Businesses, Deficient Electricity, Private Provision, Economic Development, North East Nigeria

## Abstract

*Electricity supply in Nigeria is often erratic. Consumers of electricity (residential, commercial and industrial consumers) suffer untold hardships as the State Owned Enterprise; the Power Holding Company of Nigeria (PHCN) has been unable to supply reliable power. This is despite massive injections of funds by the Federal Government into the operations of the company over recent years. The failure has significantly impacted negatively on the operations of the business sector especially the small scale subsector that operates with little capital and are thus in most cases unable to afford a back-up facility to ensure un-interrupted power supply for their operations. The study examined the impact of deficient electric power supply on the operations of small scale businesses operating in north east of Nigeria. From the population of small scale businesses, a sample was selected through the use of stratified random sampling to ensure the effective representation of the population of small scale businesses in north east Nigeria. Results from data analysis indicates the severity of electricity supply outages and the costs imposed by power supply outages on the operation of this class of businesses in the region. The paper therefore recommends the need for policy attention towards revitalizing the electricity sector of Nigeria for enhanced supply of electricity to the national economy. When this is achieved, the small business sub-sector will be in a position to effectively lead in the drive towards industrializing the Nigerian economy.*

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## 1.0. Introduction

Nigeria is hugely endowed with energy resources that include oil, natural gas, coal, biomass, solar, wind and hydro resources among others (Iwayemi, 2008; Onuaha, 2010). However despite this huge endowment Nigeria is also an energy deficient country whose economy suffers tremendously from the shortage of energy supply (Iwayemi, 2008). The shortage imposes huge cost on the economy and compels widespread private provision by different classes of energy users (Lee and Anas, 1998; Adenikinju, 2005). Additionally Nigerians often spend many productive hours queuing for petroleum products in the fuelling stations to buy fuel at government regulated prices because fuel supply scarcity has been a recurrent feature of the Nigerian energy market. Fuel scarcity in the economy and failing electricity supply create dual energy crisis for Nigeria (Iwayemi, 2008). Investment in back up generating facility is widespread and imposes significant costs on the economy. Small Scale businesses suffer the most from Nigeria's energy poverty as they spend a large proportion of their capital (about 20-25% of their investment) on back up generating facilities (Lee and Anas, 1991; Foster and Steinbuks, 2008). In fact Iwayemi, (2008) links most of the country's economic woes including its

inability to industrialize to the dismal performance of the energy sector. However power supply outages are not peculiar to developing countries alone considering the recent black outs in California and other parts of north eastern United States of America. Though it has been the cardinal policy of government electricity policy and consumers desire to have power supply reliability, *keeping the light on* is an extremely difficult challenge (DOE, 2003) especially in a developing economy.

Ukpong, (1973); Iyanda, (1982); Lee and Anas, (1991, 1992); Uchendu, (1993); Ajayi (1995), Adenikinju, (2005); Oseni and Pollit, (2013) have examined the cost of power outages and unreliable supply of electricity on firms and document firms survival strategies in Nigeria and Africa. This study builds on the previous studies by focusing on the small scale businesses in the North East Nigeria for many reasons. First the small scale businesses have a lot of contributions to make towards the development of the Nigerian economy in terms of providing employment and income opportunities for the people. Based on experience, these types of businesses provide the surest path to industrialization. Additionally the choice of small scale business is informed by the fact they are the dominant businesses found in the North East region of Nigeria. Finally like other parts of Nigeria, the North East region also suffers from epileptic supply of electricity. The study is therefore expected to bring to the fore the challenges small scale businesses face due to unreliable supply of electricity in the region as a way of attracting the needed policy attention that could go to alleviate their plight. It is also expected to highlight on the investment potentials for electricity generation, transmission and distribution infrastructure that the private sector could take opportunity of in closing the prevailing deficit. This is especially important considering the recent introduction of electricity market reform in Nigeria.

### **The objective of the study is;**

To determine the impact of deficient electricity supply on the operational performance of small scale businesses in north east Nigeria.

Consequently the research intends to test the hypothesis that:

*Deficient electricity supply does not significantly constrain the operational performance of small scale businesses in north east Nigeria.*

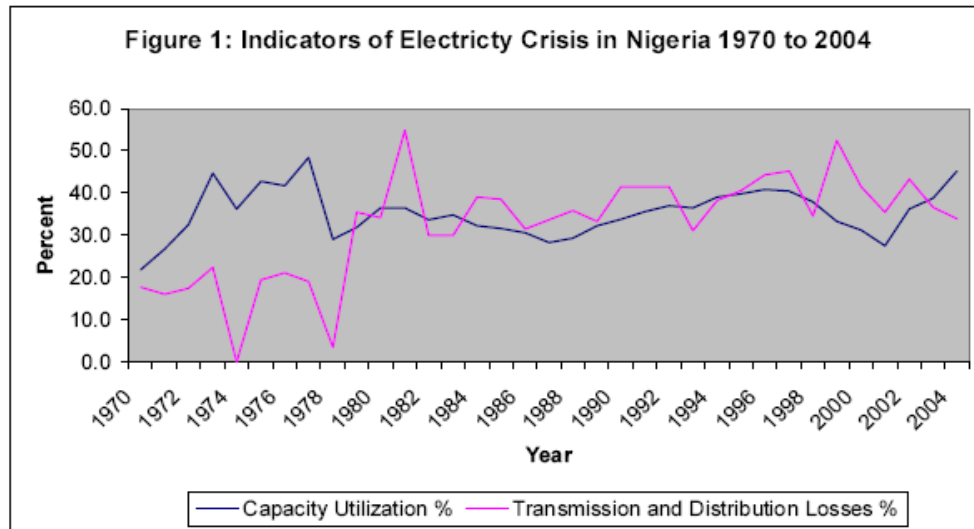
The rest of the paper is organised as follows: section two presents the literature review and the methodology to be used in the conduct of the study. Data analysis and hypothesis testing are performed in section four while section five presents the concluding parts of the study.

## **2.0 Conceptual and Empirical Discussions**

### **2.1 The State of Power Supply in Nigeria**

The dismal performance of the Nigerian electricity supply industry is well noted (Adenikinju, 2005; Iwayemi, 2008; FGN, 2008; FGN, 2010 among others). Nigeria's quests for industrialization have been hampered by erratic and inadequate electric power supply (Olugbenga, Jumah and Phillips, 2013). This is largely due to inadequate generation, transmission and distribution infrastructure. Though a lot of resources have been expended to expand the industry's infrastructure (the amount spent from 1999 to 2004 was higher than that spent on the power sector between 1981 to 1998), Nigerians still experience inadequate and unreliable electric power supply characterised by high voltage variations, recurrent black outs and brown outs and pervasive reliance on self generated electricity (Iwayemi, 2008). Because of the pervasive dependence of the electricity consumers on generators, the Nigerian economy has been described as a *generator economy* (Ekpo, 2009) exemplified by high operational costs and poor competitiveness. Thus Nigeria's persistent electricity crises have hampered the

industrialization process of the country due largely to production stoppages and high operational cost. These have undoubtedly significantly undermined the growth and development process of the economy (Udah, 2010). The huge transmission and distribution losses and low capacity utilization (about 40%) in the industry define the dismal performance of the electricity sector as indicated in the diagram below



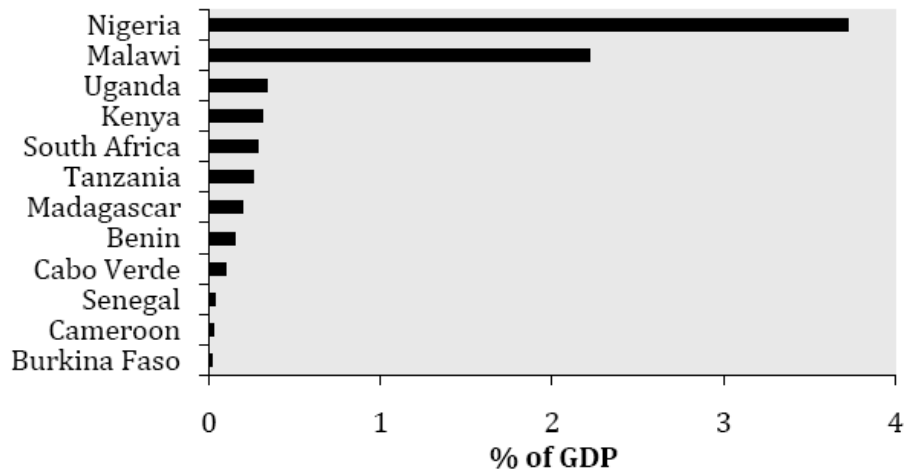
**Figure 1: Indicators of Electricity Crisis in Nigeria 1970-2004**

**Source: PHCN and NEPA as cited in Iwayemi, (2008)**

Consequently power outages have become the norm in Nigeria. In fact in 2004, major manufacturing firms experienced 316 outages. This increased by 26% in 2005, followed by an explosive 43% increase between 2006 and 2007 (Iwayemi, 2008). Due to the incessant power supply challenges, in 2005 the Government promulgated reform of the industry by opening the sector for private investment especially in the generation segment of the market (FGN, 2010). The reform has however failed to enhance the quantum and reliability of power supply in Nigeria. The result is the frequent power supply failure that has made electric power supply to be very unreliable and inadequate

Electricity supply reliability has become an important public policy issue due to the enormous costs being born by electricity users due to unreliable and inadequate electric power supply. Ensuring electricity supply reliability has also occupied important space in private investment and operating decisions (DOE, (2003). Consumers of electricity require infrequent occurrence of outages or other power supply disturbances which usually interfere with their use of electrical appliances (for domestic consumers) or halt their production or operational activities. Even at macro level, unreliable power system poses serious challenges to the socio-economic and political structure of an economy. Some of these challenges manifest in the loss of welfare, pressure on governance, and loss of output among others (Oseni and Pollit, 2013). Poor electricity supply in Nigeria and indeed the rest of Africa has posed the greatest challenge to productivity, investment growth and competitiveness (Renneika and Svenson, 2002; ADB, 2009). For example an average firm in Nigeria in 2007 experienced an outage of 8.2 hours, 26.3 times in a typical month translating into about 216 hours on average every month (Oseni and Pollit, 2013). Business firms respond to unreliable supply of electricity in a variety of ways which include choice of business, choice of location, output reduction, factor substitution and self generation.

However, self generation has been the most widely adopted strategy (Lee and Anas, 1989; Adenikinju, 2005). Firms invest in back up capacity to generate their own electricity during power outage. Reinikka and Svensson (2002) found that unreliable and inadequate electric power supply (which compelled firms to invest in back up generations) greatly reduces firms' investment in other productive activities. In Nigeria, it has been estimated that firms self generate their electricity at a cost that ranges between 16 to 30 times higher than the publicly provided electricity (UNDP/World Bank, 1993). Thus the unreliable supply of electricity imposes enormous costs on the firm. Such costs include raw materials damages, equipments spoilage and lose of productive man-hours and forgone sales, disruption of production, reduced profits and management attention among others. As a strategy of mitigating the costs of unreliable or inadequate power supply firms invest in back up facilities to generate owned electricity in house. As a result many firms are forced to maintain back-up generation capacity. However self generation of electricity generally costs more than the grid supplied electricity. This cost differential limits the potentials of self generation as a permanent substitute or solution to power supply unreliability. Figure 2 presents the economic costs of electric power outage (as a percentage of GDP) in some selected African countries, Nigeria has the highest with more than 3.5% of GDP (Eberhard, et al, 2009).



**Figure 2: Economic Costs of Power Outages in Selected Countries**

**Source:** Eberhard, et al (2009) reported in Foster and Pushak, (2011)

The distribution of cost imposed by the frequent power outages is disproportionately high for the small scale businesses. Small scale businesses spend about 25% of their investment costs on back up generating plant (Lee and Anas, 1991). Even the large industrial concerns also suffer hugely from electricity supply shortages bedeviling the country. The Manufacturer's Association of Nigeria (MAN) Survey, (2005) reports that the cost for generating power supply by Nigerian firms for production activity amounts to about 36% of firms' costs of production. Iwayemi, (2008) also estimated that 20% of investment in large industrial projects is usually allocated to alternative source of electricity supply. In fact it is reported that banks insist on provision for captive generating plants before any loan request is considered worthy of being granted (Ajayi, 2005).

The nation's difficult business environment largely been caused by inadequate power supply is aptly described by the World Bank (2004:135) report that 'manufacturing firms in Nigeria consider inadequate infrastructure particularly power supply as their most severe constrain...' Table 1 depicts electricity supply to different industrial axes of the country in

percentage. The Bauchi, Borno, Benue and Adamawa axis received 52.5% of its power needs in 2003, 19.75% in 2004, 57.55% in 2005 and 60.60% in 2006 receiving on the average about 34.1% of the electricity needs of the region (MAN, 2007)

S/N	ZONE	PERCENTAGE OF POWER SUPPLY BY NEPA/PHCN IN:			
		2003	2004	2005	2006
1.	Oyo, Osun, Ondo, Ekiti Axis	53.00	39.60	26.65	33.30
2.	Edo/Delta Axis	39.30	18.30	64.60	45.70
3.	Anambra/Enugu Axis	43.10	24.13	25.65	23.70
4.	Kano State Axis	24.5	28.75	40.40	39.15
5.	Bauchi, Borno, Benue, Adamawa, Plateau Axis	52.50	19.75	57.55	60.60
6.	Ogun Axis	22.30	46.25	54.35	50.60
7.	Imo/Abia Axis	33.20	28.30	41.85	31.90
8.	Kaduna Axis	44.00	31.25	46.25	27.40
9.	Rivers Axis	45.50	8.00	40.65	44.50
10.	Lagos Axis	48.30	39.18	52.70	52.25
	<b>Average Per Year</b>	<b>40.56</b>	<b>31.30</b>	<b>45.40</b>	<b>41.70</b>

**Table 1: PHCN Electricity Supply to Industrial Axes of Nigeria**

## 2.2. Small Scale Businesses

Small scale businesses are very crucial to the economic development of any nation. They make substantial contributions to the economy through many channels. For example small scale enterprises are known to make about 55% of GDP and 65% of employment in high income countries. In the low income countries small scale businesses contribute over 60% of GDP and about 70% of total employment (Fan, 2003; Ariyo, 2006). Their economic contribution in Nigeria falls below expectation due largely to the harsh economic environment (Osotimehin, Jegede, Akinlabi and Olajide, 2012). The shallow infrastructure base of the economy means that small scale businesses just like other business types face serious operational challenges and must have to provide for most of their infrastructure needs if they have to optimize their operations.

## 2.3. Empirical Review

Adenikinju (2005) undertook an analysis of the economic costs of power outages in Nigeria using the revealed preference approach. He estimated the marginal cost of power outages to businesses in Nigeria to be in the range of \$0.94 to \$3.13 per kWh of lost electricity. Reinikka and Svensson (2002) analyzed the impact of poor provision of infrastructure on firm performance in Uganda using a discrete choice model on business survey data. They concluded that unreliable power supply causes firms to substitute complementary capital (for backup generators) as a response to deficient public services. Estimating investment equations on the same data, they found that poor complementary public capital significantly reduced private investment. Lee and Anas (1991) in their study on manufacturers responses to infrastructure deficiencies in Nigeria reported four different response patterns adopted by manufacturing firms which include self sufficiency (where the firm provides all its infrastructure needs), standby private provision (the firm has its own facilities which it turns to when public supply is absent or quality and reliability fall below acceptable standards), public source as standby (the firm relies on its own facilities and turn to public supply when the quality and reliability improves) and captivity (where the firm relies entirely on the public service despite the quality and reliability of such supplies). Lee, Anas, Verma and Murray, (1996) in their study of reasons for self generation of electricity by manufacturing firms in Nigeria, Indonesia and Thailand found that because of economies of scale in internal electricity generation enjoyed by larger



firms, small scale businesses are at disadvantage and therefore suffer more from electricity supply unreliability than larger firms. Idah, (2009) undertook an empirical study on the effect of electricity supply on industrial development in Nigeria and found that the dismal performance of the electricity sector has contributed in retarding the industrial development of Nigeria. He therefore concluded that fixing the electricity sector is central to the realization of industrial development of Nigeria.

#### 2.4. Methodology and Data Analysis

The research surveys existing small scale businesses/firms in Adamawa, Bauchi, Borno Gombe, Taraba and Yobe States that are into manufacturing, service provision and trading. The research surveys responding firms on their experiences with frequent power supply failure. The research also analyses the impact of the incessant power supply failure on the operations of the responding firms and document their response pattern. From the population of small scale businesses sample was drawn using the simple random sampling technique from the population of SMEs in the North east region. The research generates primary data through the use of structured questionnaire personally distributed to the respondents by the researchers and their assistants.

The questionnaire contains items on the general information of the company (such as the number of employees of the company, turn-over, sectoral classifications among others etc), respondents' experience with power interruptions, respondents' satisfaction with the status of power supply as used by Bliem, (2009). Other important items covered in the questionnaires include the estimate of the costs of power supply deficiency on the respondents operations and the response pattern adopted to deal with the dismal power supply as employed by Adenikinju, (2005), Lee and Anas,(1998); Rennika and Svenson (2002) among others. The instrument was subjected to reliability and validity tests (face and content validity). The data collected was subjected to descriptive analysis (such as percentages, mean, frequency standard deviation) and inferential analysis using regression analysis as suggested by Hairs, Anderson, Tatham and Black (1998). Simple bivariate regression analysis was used to analyse the impact of the IV (deficient electric power supply) on the DV (operations of small scale businesses, response pattern). From a population of 468 firms (Federal Ministry of Industry, 2013) a total of 312 questionnaires were distributed to small scale businesses in the region out of which about 245 were retrieved. About 4 questionnaires were returned unfilled. 241 questionnaires were entered into the data file. 7 questionnaires were found to be defective, data and descriptive analysis.

Table 2 presents descriptive data about the firms surveyed. About 32% of the firms were engaged in manufacturing activities which include bottled and sachet water, block making, bread and confectionaries among others. 35.5% of responding firms are engaged in service provision such as computer and media services, transportation services, barbing and hair dressing, restaurants among others. The remaining 33.3% are engaged in trade. In terms of employment only 9% of the firms surveyed employ more than 50 persons. More than half of the firms have less than 10 persons in their employment. In terms of capital invested about 82% of the responding firms invest less than 27, 000 dollars. Up to 18% of responding firms reported investing more 27,000 dollars. On annual turn- over, 73.5% of firms reported having a turn-over of less than 14 thousand dollars while only 7% have turn-over in excess of 136 thousand dollars. On the duration of business 56% are less than 5 years while 44% have been in business for more than 5 years. Firms were asked to rate their electricity needs into low, medium and high. About 20% indicated low, while 44% and 36% indicated medium and high respectively. This means

that frequent power outages being experienced in the country imposes significant costs on the significant number of small scale firms. On the respondents experience with power outage, about 17 % experienced outage less frequently while 44% experience frequent power outage.

On the other hand 36% indicated they experienced power outage most frequently. On the costs invested in the acquisition of back up generating facility for in-house generation of electricity as a proportion of the firm's investment, 30% invest about 5% of their total investment on back up facility while 65% spent about 6-10% of their investment to self provide due to unreliable power supply. On the other hand 5% of the responding firms spent more than 10% of their total investment on the acquisition of generating facility. Cost of generator as a proportion of investment in equipment, 60% spend between 20-29% while 30% spend between 30-50% and 10% spend above 50% of total investment in equipment. Length of managerial experience is found to influence the mitigation decision of firms faced with unreliable supply of electricity (Oseni and Pollit, 2013). Accordingly firms responded as thus; 46.5%, 6-10 years, 43.2% and above 10 years 10.3%

As a way of gauging the willingness to pay (WTP) for improved electricity, firms were asked to state their monthly electricity bills. About 59% pay less than 55 US dollars per month while 36% 56-105 dollars and 111 and above. On the other hand monthly expenditure on fuelling and generator maintenance gulps between 111 to 250 dollars for 32% of the respondents and 255-388 dollars for 50% of respondents while 394 dollars for the remaining 18% of the sampled respondents. Finally respondents were asked to state the number of days they stay without light from the public supply in a month. 31% reported 5-10days without electricity in a month, 41% reported 11-15days and 28% reported 16days and above.

Variable	Manufacturing	Service	Trade	Total
Line of Business	31.2	35.5	33.3	100.0
<b>Variable</b>	Less than 10	10-50	Above 50	
Number of Employees	55.6	35.5	9.0	100
<b>Variable</b>	Less than US \$ 27,778	US \$ 27,778-272,222	Above US \$ 272,222	
Capital Invested	71.8	20.5	7.7	100
<b>Variable</b>	Less than US \$ 13,889	US \$ 13,889-136,111	Above US \$ 136,111	
Turn over	73.	20.9	5.6	100
<b>Variable</b>	Less than 5 years	Above 5 years		
Duration of Business	56.0	44.0		100
<b>Variable</b>	Low	Medium	High	
Electricity Needs	19.7	44.4	35.9	100
<b>Variable</b>	Less Frequent	Frequent	Most Frequent	
Experience with Power Outage	17.1	46.6	36.3	100
<b>Variable</b>	5%	6-10%	Above 10%	
Cost of Generator as % of total investment	29.9	65.0	5.1	100
<b>Variable</b>	20-29%	30-50%	Above 50%	
Cost of Generator as Proportion of Investment in Equipment	59.8	29.9	10.3	100
<b>Variable</b>	Less than 5 Years	6-10Years	Above 10 Years	
Length of Managerial	46.5	43.2	10.3	100

Experience				
<b>Variable</b>	Less than 55dollars	56- 105.5 dollars	111 dollars and above	
Monthly Electricity Bill	59.0	35.9	5.1	100
<b>Variable</b>	111- 250 dollars	255- 388 dollars	394 dollars and above	
Monthly Expenditure on fuelling and maintaining backup generator	32.1	50.0	17.9	100
<b>Variable</b>	5- 10 days	11-15 days	16 days and above	
Number of Days without power in a month	30.8	40.6	28.6	100

**Table 2: Descriptive Data.****Source: Field Data, (2015)**

Table 4 presents the model summary and regression ANOVA statistics. The model depicts an r value of .543. This indicates that the independent variable explains variation in the dependent variable by about 54%. A change in the IV will cause a change in the DV by about 54%. Thus a small scale business operation is constrained by deficient and unreliable electricity supply in the north east Nigeria. In other words improvement in electricity supply in the region will improve operational performance of small scale businesses in the region.

Model	R	R Square	Adjusted R Square	Sum of Squares	df	Mean Square	F	Sig.
1								
Summary	0.543	0.295	0.292					
Regression				15.244	1	15.244	97.252	0.000
Residual				36.366	232	0.157		
Total				51.610	233			

**Table 4: Model Summary<sup>b</sup> and ANOVA<sup>b</sup> Statistics****Source: Field data, 2015**

Table 5 presents the model regression coefficients. The table shows p value at 0.000 implying that the influence of the model is significant. The influence of the model is therefore significant and not by chance.

Model	Unstandardized Coefficients			Standardized Coefficients		
	B	Std. Error		Beta	t	Sig.
1	(Constant	2.110	0.172		12.242	0.000
	UPS	0.412	0.042	0.543	9.862	0.000

a. Dependent Variable: FO

**Table 5: Model Regression Coefficients**

Table 5 indicates the model's reliability statistics. With a Cronbach's alpha of .69 and Cronbach's Alpha on standardized items at .70 the model reliability is highly reliable.

Cronbach's Alpha	Cronbach's Alpha on Standardized Items	N of Items
0.687	0.704	2

**Table 6: Reliability Statistics****Source: Field data, 2015**

On the basis of the result of the analyses shown in the tables we will test our hypothesis.

The hypothesis states that:

*Deficient electricity supply does not significantly constrain the operational performance of small scale businesses in the north east Nigeria.*

Table 5 shows a p value of 0.000.

Decision rule: Reject  $H_0$  if  $P < 0.05$

Accept  $H_0$  if  $P > 0.05$

With this decision rule the null hypothesis is rejected which states that *Deficient electricity supply does not significantly constrain the operational performance of small scale businesses in the north east Nigeria* and the alternate hypothesis which states that *Deficient electricity supply significantly constrains the operational performance of small scale businesses in the north east Nigeria* is accepted

### 3.0. Discussion and Conclusions

From the data analysis conducted it is clear that small scale businesses suffer from inadequate and unreliable supply of electricity in the north east sub-region which imposes costs in many ways. Most of the small scale businesses invest resources to complement the publically provided but insufficient electricity supply in the region. They are compelled to invest significant amount of their resources as back up facilities to self provide electricity when the publically provided power becomes unreliable or of lower quality. It was also discovered though small scale businesses made such investment they deny themselves investments in other capital. Additionally all firms invest adequately to provide for all their electricity needs due to the paucity of resources. These findings confirm such studies as Lee and Anas (1991); Lee et al.(1996); Rennieka and Svennson (2002) Adenikinju,(2005); Oseni and Pollit, (2013) which document the enormous difficulties being experienced by businesses in Nigeria and other parts of Africa due to inadequate and unreliable electric power supply. Thus an inadequate and unreliable supply of electricity imposes costs and therefore constrains on firms' operational performance.

In conclusion, firms suffer tremendous costs due to serious supply deficit of electricity in Nigeria which greatly hampers businesses especially the small scale subsector. The Nigerian Government needs to consider the issue of power supply reliability very seriously by facilitating both private and public investment in electricity infrastructure. This will go a long way in enhancing the performance of the small scale businesses and thus the ensuring the industrial development of Nigeria.

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# Supply chain responsibilities and the need for an integrative ethic Management in Emerging Economies

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## Key Words

Sumangali Scheme, Integrated Social Contract Theory, hypernorms, rules of procedure, authentic norms, legitimate norms, relativism, universalism, supply chain

## Abstract

*The economic importance of the Indian Textile and Clothing (T&C) industry is unquestioned. It is one of the second largest employment generating industry, after agriculture, with direct employment of over 35 million people. Tamil Nadu accounts for over 65% of the total number spinning units in India and has been reported exploiting young women workers in the spinning and textile units what is called the "Sumangali Scheme". "Sumangali" in Tamil means 'happily married woman'.*

*Globalization confronts decision-makers in connection with global conditions in identifying labour standards that can serve as guidelines for corporations producing or outsourcing outside of their home country. The Article shows that in a globalized business world the concept of a conventional corporate ethic system to put all energy into the development of codes of conduct, and ethical audits and sustainability reporting falls short. This applies to industries like the Tamil Nadu textile industry, as there is no clarity with regard to the causal factors and the key players in the supply chain of such a complex social system. The Integrative Social Contract Theory (ISCT) allows understanding the problem of Supply-Chain Responsibilities as a contractual relationship that denotes concrete moral responsibilities.*

## 1. Introduction

In times of globalization, companies act internationally or globally. The globalization of companies is a challenge for corporate ethics. Thus, an adjustment of the corporate ethics to an international or global framework is necessary. The managers of firms have to decide to which norms and values they want to conform in their daily work. The decision of a manager has to meet the requirements of the external legitimacy of the company's behaviour and the internal coordination of the employees' behaviour.

Deficient international laws or lack of enforcement of local or national legislation necessarily requires a voluntary self-commitment. Harmonization of the ethical notions of the head offices and the ethical standards as practiced by the settlements is sometimes possible to a certain degree only. A differentiation with respect to the host country's culture, grounded on a common base of ethical norms, can help to avoid conflicts. These are all notions and claims publicized by the companies in the media but not honoured in reality.

Textile and Clothing (T&C) is one of the largest and most important industries in the Indian economy in terms of output, foreign exchange earnings and it directly employs over 35 million people. The value chain in the sector comprises of spinning, weaving, knitting and garment manufacturing. The state of Tamil Nadu plays an important role in the Indian T&C industry and global brands and retailers. The cotton spinning sector is the backbone of Tamil Nadu's textile industry and accounts for over 65% of the total number of spinning units in India. Global brands and retailers source their products from spinners and garment manufacturers accused of be exploiting - under Sumangali Scheme - young women who likewise could have

the status of working children, with the promise of a lump sum payment (approx. US\$ 500-1000) after 3 years. "Sumangali" in Tamil means 'happily married woman'.

These brands and retailers include, amongst others, H&M, C&A, Marks & Spencer, S. Oliver, Diesel, Old Navy (GAP), Timberland, Tommy Hilfiger, Primark, TESCO, Bestseller, Mothercare and Asda-Walmart.

For a better understanding of the issue of Sumangali and the extensiveness of its practice, it is important to understand the supply chain linkages. "Various research findings and media reports focused on a few suppliers, who were linked with international brands and retailers. There was mention of spinning mills being the centre of Sumangali Scheme, but none of the research and global studies has focused on the mills involvement, the mills associations, or the supply chain relationships in the South Indian textile industry" (Fair Labor Association, 2012, p. 4).

An ethical judgment and legitimation of the Sumangali Scheme in the factories can only be founded, if the overall supply chain linkages and the role that spinning mill, brands and retailers play have to be analysed regarding the question in how far they are directly or indirectly involved in child labour and other practices.

The majority of the exploitative force under Sumangali Scheme can be found to 80% in the spinning mills and 20% in the garment manufacturing value chain. The spinning process converts fibres into yarn which is then converted into fabric and used in garment manufacturing. Spinning is the third step in the supply chain immediately after cotton cultivation and conversion into cotton bales by gins. It is the foundation of all subsequent value additions in the textile value chain, i.e., weaving, knitting, processing and garment confection (Fair Labor Association, 2012, p. 10). It is important to understand the different supply chain aspects in the context of the global brands and retailers related to the issue of Sumangali. Figure 1 below shows four cases, how spinning mills sell yarn:

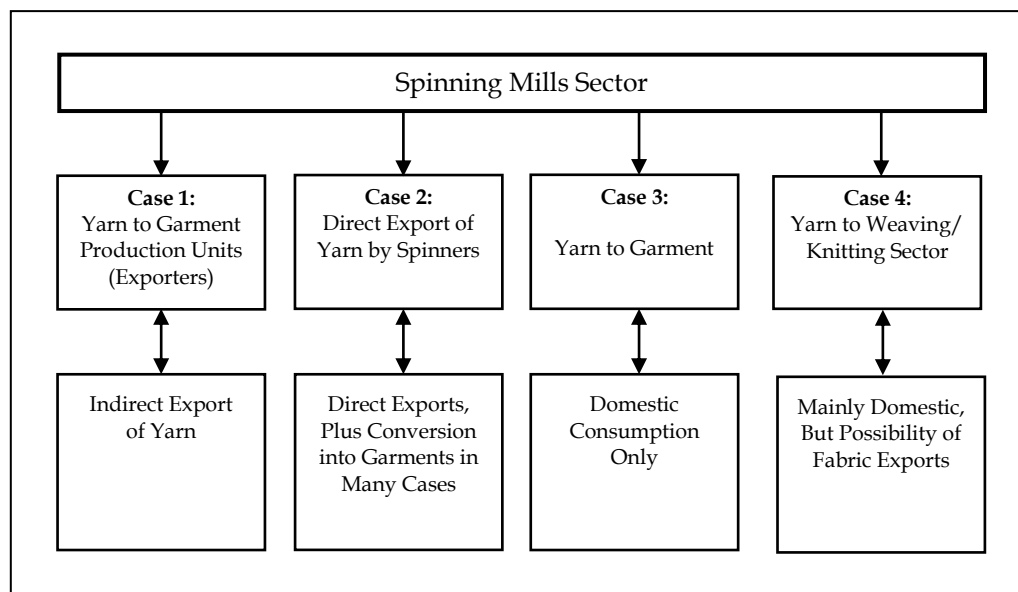


Figure 1: Spinning Mills and End Use of Yarn  
(source: Fair Labour Association, 2012, p. 11.)



1. "The yarn from the mills could be sold directly to garment manufacturers who are exporters of garments. In this case, the spinning mill product is *indirectly exported* to the global market and, hence, the involvement of global brands/retailers.
2. The yarn from the mills could be *directly exported* by the spinners themselves. This could be, for example, to countries in Europe, the U.S. and other countries where this may be used to produce fabrics. The yarn could also be exported would further use it in garment production and then export these garments into the international market. In case of direct export by spinners, international brands and retailers may not be directly involved. However, in case yarn is used by chain of international brands and retailers would be involved.
3. The yarn from the mills could be sold to garment manufacturers who mainly supply the domestic Indian market. In this case, brands and retailers from the Indian domestic market would be involved, but no other international brands and retailers, unless they sell in the Indian market (e.g., H&M does not sell in India, whereas Mothercare does sell in India). In this case, there is *no export* to global brands and retailers.
4. The yarn from the mills is provided to the weaving/knitting sectors, which converts the yarn into fabric and other uses and it is then made into various products. These products could be for the Indian domestic market or for the international market. Thus, there could be involvement of international brands and retailers, but it is not clearly defined. Thus, there could be export of such yarn depending on the end use of the product (Fair Labor Association, 2012, p. 10).

We are facing a new problem concerning collective responsibility. Most companies are parts of a chain or less formalized forms of organizations like industries and branches. They have a limited overview of the production of their raw materials and consumables are produced. Firms are best understood as parts of a network, rather than just as parts of a simple exchange between parties. Before the described problem will be analysed by ISCT – originated by Donaldson & Dunfee – the next paragraph gives a brief introduction into this framework.

## 2. ISCT – The Balance between Cultural Empathy and Cross-Cultural Normativity and Cross-Cultural Normativity

The challenge that confronts corporate decision-makers in connection with global labour conditions is often in identifying the standards by which they should govern themselves. Some managers of multinationals have adopted the theory of ethical relativism. Ethical relativism is the view that ethical standards do not fully comply with absolute truth criteria. Something is right for the people or companies in a particular society if it accords with their moral standards and wrong for them if it violates the moral standards of this particular society. Certain Asian societies hold that child labour is morally acceptable, although Germans believe it is immoral. The ethical relativist conclude that if a German company considers as wrong being involved in child labour in Germany, then it is not necessarily wrong for a Indian manager to employ children in their own society (Auchter . 2013, pp. 139-140).

The existence of some common values and norms is indispensable for sustained business relationships. The following organizations have issued the call for the introduction of universal principles and standards in business:

- Labour rights adopted by the ILO (International Labour Organization) and FLA (Fair Labor Association)
- Social Accountability 8000
- Caux Round Table Principles (Avoidance of illicit activities like corrupt practices, bribery, condone etc.)

Extreme positions of *Relativism* or *Universalism* are not useful for making effective ethical decisions in business. ISCT represents a concept of “pluralism” allowing a “moral free space”! Pluralism accepts different moral convictions, suggesting that a consensus on basic principles in a certain social context can, and should be reached. Donaldson & Dunfee integrate two distinct kinds of contracts: The first is a normative and hypothetical contract similar to the classical contractarian theories in philosophy and political economy and represents the macro-level embodied by hypernorms. The second is an existing (extant) implicit contract and reflects the micro-level that can occur among members of specific communities, including companies, departments within companies and industries in which local values are presumed to be right on principle.

Donaldson & Dunfee propose four principles to form the relations between micro- and macro-level:

1. Local economic communities can specify ethical norms for their members through micro-social contracts.
2. Micro-social contracts to specify local norms (authentic norms) must be based on informed assent which itself must be supported by the right to leave the contract.
3. In order to develop powers of obligation, a micro-social contractual norm must be compatible with hypernorms, which measure the value of authentic norms against a set of universally upheld values. These hypernorms reflect culturally invariant moral concepts. “Core human rights, including those to personal freedom, physical security and well-being, political participation, informed consent, the ownership of property, the right to subsistence; and the obligation to respect the dignity of each human person” (Donaldson & Dunfee, 1994, p. 267). Hypernorms are representing a hypothetical social contract.
4. In case of conflicts between norms, that satisfy principles 1-3, an order of priorities must be drawn up by using rules which correspond to the spirit and letter of the macro-social contract.

After reaching a method-legal consensus, authentic norms will be transformed into legitimate norms.

It has to be emphasized that all previously described elements and steps of the approach have to be considered. However, Dunfee (2006) states explicitly that most of these attempts have not been applied in the way the creators had suggested: In the majority of cases, applications have failed to use all elements of ISCT and to go through every suggested step of the judgment process. ISCT should be applied in its full scope, including the steps of determining relevant and appropriate communities, identifying authentic norms within those communities, testing those norms against substantive and structural hypernorms, and using the rules of thumb to seek for dominant norms (Dunfee, 2006, p. 313).

### 3. Applying ISCT-Theory to Practice

#### 3.1 Recognition of the Ethical Problem: Child Labour and the Sumangali Scheme

Parents, especially from poor backgrounds, struggle to earn and save sufficient money to get their daughter/s married off with reasonable gifts at the time of marriage. Hence, the Sumangali Scheme provides an opportunity to employ young women workers and children, who have few or almost no opportunities to find gainful employment.

The first issue concerning working children is to determine what a “child” is. International instruments generally use age to define a child. Along with Article 1 of The United Nations (UN) Convention on the Rights of the Child, the 2<sup>nd</sup> Article of the International Labour

Organization (ILO) Convention No. 182 accords the rights of a child to all persons under the age of 18. However, neither “child labour” nor “child employment” nor “child work” is explicitly defined in these Conventions (Edmonds, 2007, p. 7). Child labour typically refers to children who are economically active, meaning that they participate in the production of economic goods and services, excluding the persons doing household chores in their own household. Both ILO’s Statistical Information and Monitoring Program on Child Labour (SIMPOC), as well as ILO’s International Program on the Elimination of Child Labour (IPEC), define a child labourer as a child 5 to 11 years of age working in economic activities, a working child aged 12 to 14 unless performing light work, or a child aged 15 to 18 engaged in the worst forms of child labour (ILO/IPEC, 2007, p. 7).

In reality the textile industry under Sumangali Scheme employs cheap labourers as “apprentices” (trainees), well below the minimum wage, without statutory benefits such as Provident Fund (PF) and Employees State Insurance (ESI). The young “apprentices” are mostly children. It is estimated that 27% of the workers are aged 12-14 years, 40% are aged 15-16 years, 17% are aged 17-18 years and 16% above 18 years (Fair Labor Association, 2012, p. 16). Textile industry has been criticized by forcing children to work as “apprentices” for long hours, in poor and unhygienic working and living conditions, forcing them to stay in company-operated hostels, and limiting their contact with the outside world, thereby violating their fundamental rights and freedom of association (Fair Labor Association, 2012, p. 16). To understand the extent of exploitation and the problem of child labour under Sumangali Scheme it is necessary to analyse the value chain of T&C industry or in terms of ISCT ‘identifying the relevant communities’.

### 3.2 Identifying relevant communities and authentic norms

Once an ethical problem has been identified, the next step in applying ISCT is the identification of relevant key communities for the decision-making process. At this point it has to be made sure that all significant communities which may be affected by a particular business practice will be considered in the process of identifying key communities.

The definition of a community allows a great, open-ended, variety of economic communities. Consequently, defining the boundaries of a community is one of the challenging issues in applying ISCT (Dunfee, Smith & Ross, 1999, p. 30). Donaldson and Dunfee note that the relationships between or among identified communities may be *horizontal*, e.g. between nation-state to another nation-state or between competing corporations, or *vertical*, e.g. between corporate subsidiaries to parent firms or corporations to their home nation-states (Donaldson & Dunfee, 1999, p. 101). This “horizontal-vertical dichotomy” helps in identifying potential norms. The broader Indian community seems to be relevant, since the issue of child labour in the Sumangali Scheme takes place in India and the Sumangali factories employing children supply the Indian textile value chain with yarn.

The US, Germany and other European are dominant in the trade with the spinning mill sector. Even the notions and practices concerning child labour in EU states and the US presumably may not so different to German ethical notions, it is necessary to create a separate study for each country. One attempts to apply ISCT to the problem of child labour in the Sumangali Scheme in India to provide guidelines for all textile and garment corporations, trading companies despite their nationality involved in Indian textile value chain.

Child labour is traditionally anchored in Indian society: The tolerance threshold towards working children is higher and supporting the family is more important than education (Aktiv gegen Kinderarbeit, 2012). OECD-study supports the conventional view that child labour is

mainly caused by household poverty (OECD, 2003, p. 29).

The main reason why women workers took up jobs in Sumangali Schemes is the poverty at the household level. 47% women workers who have been a part of Sumangali Scheme took up jobs in mills due to their families' urging and need for a monthly income to sustain the family, while 53% chose to take up the work so that they could earn money for their dowry, and/or to get away from the village (Fair Labour Association, 2012, p.16).

Furthermore, the study showed that child labour is related to the parents' educational attainment, the Indian caste system, and the presence of education opportunities (Sakamoto, 2006, p. 26). One may assume that child labour is broadly accepted especially in poor families and in families with lower levels of education. The parents in such families believe that more children means more earning, however, their income is too low and the children are forced to work. These cultural and traditional aspects cause that children are committed to work from the beginning (Ahmad, 2004, p. 100).

Moreover, the Indian national legislation prohibits employment of children younger than 14 only in the cases of work in factories, mines or other types of *hazardous* employment, meaning that a child below 14 is allowed to work in non-hazardous industries (Article 24, The Constitution of India). The Child Labour (Prohibition and Regulation) Amendment Bill from 2012 prohibits employment of children below 14 years in certain occupations such as automobile workshops, bidi-making, carpet weaving, handloom and power loom industry, mines and domestic work. Since this is in contradiction with the Right to Education (RTE) Act. In light of the Right of Children to Free and Compulsory Education Act, 2009, the Bill *seeks* to prohibit employment of children below 14 years in all occupations except where the child helps his or her family after school hours (PRS, 2012).

In this context is to mention, India did neither ratify the ILO Convention No. 138, nor the ILO Convention No. 182.

At this point, one has to distinguish in the debate between two kinds of practiced child labour:

1. Children under age of 14 engaged in light work, as long as their employment does not prevent them from attending school, and
2. Children between 14 years and 18 years, conditionally eligible to enter the labour market not allowed to perform hazardous work.

In this study, the author put the focus on the first issue because these children deserve special care and protection due to their vulnerability. The economic situation puts condoned pressure by the parents to force their children below the age of 14 to work under the conditions of the Sumangali Scheme.

One has to consider that parents lack information and awareness about the real situation of their children working under Sumangali Scheme. Parents believe that mills and garment units ensure full security and safety for their children within the premises. The Sumangali Scheme seemed to be a win-win situation for all, it started with good objectives in mind. However, after it became popular, each mill began interpreting it differently leading in a lot of cases to the exploitation of the working children (Fair Labour Association, 2012, pp. 7-9). Over 80% of the labourers under Sumangali in the 12 to 18 age group are more or less pressured by their parents sent to work. Based on this evidence, it may be assumed that non-hazardous employment of children (below the age of 14) is an *authentic norm* within the broader Indian community.

Germany, in contrast, is one of the pioneers in the fight against child labour. It was one of the first countries to ratify the UN Convention on the Rights of the Child, the ILO Convention No. 138 and the ILO Convention No. 182. The German legislation prohibits the employment of children below the age of 15, however children above the age of 13 may be employed under

strictly specified conditions (Jugendarbeits schutzgesetz § 5). Furthermore, there is an *obligation* for children to attend school in Germany, making it more difficult for children to participate in illegal employment. However, Indian children aged 6 to 14 have the *right* (but not the obligation) to attend school due to the Right of Children to Free and Compulsory Education (RTE) Act 2009. Moreover, there is a considerable presence of organizations and activists endorsing the fight against child labour in the German media (Aktiv gegen Kinderarbeit, 2012), and many large German companies in their corporate code prohibit participation in child labour or even participate in child labour enforcement. In general, it seems that the German society holds a norm against the use of hazardous child labour and the employment of children below the age of 14.

Consequently, it may be presumed that the Indian community holds an authentic norm allowing children below the age of 14 to be economically active, as long the work is not harmful, whereas in the broader German community a tendency towards an authentic norm prohibiting the employment of children below the age of 14 is apparent.

### 3.3 Determining legitimacy of the authentic norms und hypernorm test

In order to determine the legitimacy of the identified authentic norms, it has to be verified that there is no violation of *hypernorms*. However, Donaldson and Dunfee refuse to provide a comprehensive list of hypernorms, they leave the task of identifying hypernorms to ethical theorists. In this context, they offer a set of proxies for identifying presumptive principles with a hypernorm status relevant to a pending decision. The different kinds of evidence in support of a hypernorm are as follows (Donaldson & Dunfee, 1999, p. 54, p. 256):

1. Widespread consensus that the principle is universal.
2. Component of well-known global industry standards.
3. Supported by prominent nongovernmental organizations such as the International Labour Organization or Transparency International.
4. Supported by regional government organizations such as the European Community, the OECD, or the Organization of American States.
5. Consistently referred to as a global ethical standard by international media.
6. Known to be consistent with precepts of major religions.
7. Supported by global business organizations such as the International Chamber of Commerce or the Caux Round Table.
8. Known to be consistent with precepts of major philosophies.
9. Generally supported by a relevant international community of professionals, e.g., accountants or environmental engineers.
10. Known to be consistent with findings concerning universal human values.
11. Supported by the laws of many different countries.

Generally, it can be said that the more types of evidence in support of a hypernorm, the stronger the presumption.

An authentic norm, which is consistent with hypernorms, is considered to be both legitimate and obligatory, though norms violating hypernorms have to be rejected.

The following sources cover a large portion of Donaldson and Dunfee's suggested types of evidence regarding the identification of hypernorms: The United Nations (UN), the International Labour Organization (ILO), the Organisation for Economic Co-operation and Development (OECD), the European Union (EU), major religions and the Caux Round Table. These sources provide guidance regarding the identification of hypernorms with respect to the Donaldson and Dunfee standards 1-4 and 7-9. To a much lesser extent, various documents

provide some guidance for the standard 5, 6 and 11. The following analysis investigates each source in terms of child employment and labour conditions. Fundamental issues of labour rights are not considered. A detailed consideration of the findings would go too far. Table 1 summarizes the results of the analysis.

		prohibition of employment of children aged below 14	protection against hazardous and exploitative conditions	right to minimal education
<b>United Nations</b>	Universal Declaration of Human Rights	-	✓	✓
	UN Convention on the Rights of the Child	-	✓	✓
<b>ILO</b>	ILO Convention No. 138	✓	✓	✓
	ILO Convention No. 182	-	✓	✓
<b>OECD</b>	OECD Guidelines for Multinational Enterprises	-	✓	-
<b>European Union</b>	Charter of Fundamental Rights of the EU	✓	✓	✓
<b>Major Religions</b>	Christianity, Islam, Judaism, Buddhism	-	✓	✓
<b>Caux Round Table</b>	Stakeholder Management Guidelines	-	✓	✓
<b>hypernorm status</b>		-	✓	✓

Table 1: Child employment: Hypernorm recognition (own illustration)

Taking the analysed sources from which to seek evidence for presumptive hypernorms in totality, it may be concluded that there exist the following hypernorms in terms of child employment:

- Children may not be employed under conditions which are hazardous or exploitative, rather they have a right to appropriate working conditions. Especially children aged below 14 are only allowed to perform light work.
- The employment of children is not legitimate in cases of deprivation of the child's educational opportunities. This principle applies until the child has reached the age of finishing compulsory schooling, respectively until the child has attained basic education (at least 14 years old).

Adopting these hypernorms one can say, that the German authentic norm does not violate any hypernorm and thus is legitimate. The Indian norm allowing children younger than 14 to be economically active is more problematic. The fact that the children aged under 14 does not represent a problem as long the children participate in light work. Since the activities performed by these children are neither harmful nor dangerous, the hypernorm of protecting children against exploitative and hazardous working conditions is also not violated.

It is decisive whether the children work full-time or only after school hours during their leisure time. Working full time under the age of 14 like in the Sumangali Scheme would originate a clear breach of the hypernorm on the right of education. According to ISCT, this practice is not legitimate and consequently unethical. Under such conditions, a German manager should not do business with an Indian businessman even involved indirectly into the Sumangali Scheme. On the other hand, the practice would be legitimate when the Sumangali children attend school and achieve basic education, or work only in their free time after school hours. In

this setting, the practice would not violate any hypernorm. However, according to the ISCT decision-process, the issue would require resolution under the rules of thumb, since the German and Indian norms would be in conflict.

### 3.4 Ethical Judgement (Rules of Thumb)

An important feature of the ISCT decision-process is that different behaviors are re-cognized to coexist among different communities. When conflicts arise between norms and practices, the issue requires applying the rules of thumb. The following six rules must be applied to help resolve them (Donaldson & Dunfee, 1999, pp. 182-191):

1. Transactions solely within a single community, which do not have significant adverse effects on other humans or communities, should be governed by the host community's norm.
2. Community norms including a preference for how conflict-of-norms situations should be resolved should be applied, so long as they do not have any significant adverse effects on other humans or communities.
3. The more extensive or more global the community which is the source of the norm, the greater the priority which should be given to the norm.
4. Norms essential to the maintenance of the economic environment in which the transaction occurs should have priority over norms potentially damaging to that environment.
5. Where multiple conflicting norms are involved, patterns of consistency among the alternative norms provide a basis for prioritization.
6. Well-defined norms should ordinarily have priority over more general, less precise norms.

The rules must be applied as a set, with no prior assessment of relative importance among them. If a clear dominant norm emerges, ethical judgment should be based on it. If the principles fail to identify a clear dominant norm, particularly when the preference is weak, mixed, or absent, then the decision-maker is permitted to act within his moral free space and follow his own values in determining which of the competing norms to follow. In such a case, ethical judgment can be based on any of the legitimate norms (Donaldson & Dunfee, 1999, pp. 190-191). By applying rules of thumb we have to distinguish according the cases described above (see figure 1) whether the German manager is directly or indirectly involved in the Sumangali Scheme. The result of applying the ISCT priority rules is illustrated and summarized in table 2 at the end of this paragraph.

#### Priority Rule 1: Transactions solely *within* a single community

The first rule of thumb deals with "*transactions solely within a single community*" (Donaldson & Dunfee, 1999, p. 184) and it seems that this rule applies to case number three explained in figure 1. There are not any significant adverse effects on others. Therefore, one could argue that this act should be governed by the host community's norm, hence it does not appear that this rule applies in this case.

One might ask why the German manager should care about the ethicality of certain actions of the Indian producer and consumers, since the German managers (retailers like C&A) are not directly involved in the questionable activities. Dunfee (1999) responds to this question, arguing that existing morality within markets creates obligations for corporate managers. His second principle for respecting marketplace morality states that "managers must respond to and anticipate existing and changing marketplace morality relevant to the firm that may have a negative impact on shareholder wealth" (Dunfee, 1999, p. 149). For managers, it means that not

considering the moral desires of e.g. important customers or other stockholders in the relevant marketplace may result in declining sales. It follows that if a German manager fails to anticipate existing attitudes within the market he or she serves (in our case it's the German market), he may end up making decisions that have a negative impact on his company's shareholder wealth (Dunfee, 1999, pp. 150).

Considering Dunfee's argument than it does appear that this rule applies in this case.

### **Priority Rule 2: Priority rules adopted as norms within communities**

Here, the question arises whether the broader German or Indian communities have their own framework for resolving conflicts, so long as they do not have significant adverse effects on other humans or communities. It seems that there are no specific community rules prohibiting making business with someone (Indian trader, spinning mill, garment producer) being supplied by engaging children in hazardous work in the Sumangali Scheme. Within that community, this behaviour might be the norm, and as long as other people and communities are not hurt, it might be appropriate.

"Yet another context shows the importance of this rule. Many firms, particularly those with very strong core values, have set up internal rules for dealing with problematic conflict-norm-situations. Levi Strauss (LS), for example, has set up standards determining the circumstances under which it will allow production of its products in other countries. LS recognizes that other firms and cultures may have norms at a direct variance with those of LS concerning the minimum working age, work conditions, support for employee education, and so on. LS not only specifies how they will resolve their own conflicts, but they make it very clear that they will follow rigid rules in dealing with contractors, requiring, in essence, that their contractors implement specified LS norms on these issues. [...] Rules of thumb such as those followed by LS may result in the firms being classified as 'corporate imperialists'" (Donaldson & Dunfee, 1999, p. 186).

However, there are community-members (Germany, Netherland, the United Kingdom) provoking boycotts of products made with the help of child labour. But it is not clear whether these boycotts include light work performed by children participating in school education. Furthermore, boycotting such products could lead to significant adverse effects: If children are not allowed to help their poor families, in the worst case they could die of poverty and hunger. It seems that such priority rules do not exist, and thus the second rule of thumb does not appear to apply in this case.

### **Priority Rule 3: Relative size of communities**

The broader and more global the community which is the source of the norm, the greater the priority which should be given to the norm. The majority of the exploitative force under Sumangali Scheme can be found to 80% in the spinning mills and 20% in the garment manufacturing value chain. Compared to the whole Indian economy the norms and practices of Sumangali Scheme should not take precedence over the broader Indian business community. This priority rule supports the norm not allowing child labour aged under 14 even in cases of light work.

### **Priority Rule 4: Essentialness to transaction environment**

Norms essential to the maintenance of the economic environment in which the transaction occurs should have priority. The norms practiced under Sumangali Scheme are affecting the market transaction in the supply chain differently. In the cases one and two (see Figure 1) yarn is directly and indirectly exported, so German managers are affected. Norms



essential to maintaining the broader economic environment (all export markets in Europe and US. except China and Bangladesh) should have priority over economically damaging norms. Considering Case 3 where yarn from the mills is sold to garment manufacturers who mainly supply the domestic Indian market, this transaction can be governed by the host community's norm. But in this case the Sumangali Scheme is also incommensurable with the Indian authentic norm.

### **Priority Rule 5: Patterns of consistency across communities**

Donaldson and Dunfee acknowledge that complex situations may involve numerous communities, especially when a norm is identified in diverse cultures (Donaldson & Dunfee, 1999, p. 188). ILO estimates that in 2008 there were 306 million children economically active around the world, most of them in the Asian-Pacific region, followed by Africa. Since the practice of working children is also common in other regions of the world, in most cases these communities do not distinguish in respect to age and whether work is harmful or not. There is no pattern of consistency among alternative norms providing a basis for prioritization except for those to be found in major religions.

India is a multi-religious country, dominated by Buddhism and Hinduism. The religions considered here include Protestant traditions, Catholicism, Islam, Judaism, Hinduism and Buddhism. The following findings are mainly based on a study by ILO (2012) and summarize the most important aspects concerning child labour.

Protestant traditions state that children should not be forced into labour, but educated, since the rights and dignity of children should be protected. The Catholic tradition says that child labour in its intolerable forms is not acceptable. Moreover, this religion explains that children should not be placed in workshops and factories until their bodies and minds are sufficiently developed (ILO, 2012, p. 41). In the Islamic tradition, child labour is unlawful since children cannot legally agree to a contract of employment until they have reached an appropriate age. Domestic duties performed by children should not affect their education, because they have the right to proper education. In line with Catholicism and Islam, education in the Jewish tradition is important, too. The children's families and communities are responsible for providing education. Furthermore, children should not be subjected to harmful hard labour (ILO, 2012, p. 42). Buddhist tradition is also sceptical towards child labour. For instance, the minimum age for full ordination into monastic life is 19 years, which indicates a necessary level of maturity (Peccoud, 2004, p. 47). The Hindu religion clearly says that from age 8 to 16 children should go to school for education (Weiner, 1999).

Summarizing, in all traditions, exploitative and harmful child labour is regarded with scepticism, since it is considered to be incompatible with the values of human worth and dignity. In addition, the religions attach importance to education. Priority rule number five does apply, since the practice of working children is also common in other regions of the world, and there are other countries holding norms against employing children.

### **Priority Rule 6: Well defined priority over less precise norms**

This rule supports the Indian norm, since the norm allowing the employment of children below 14 under non-hazardous and non-harmful working conditions is more precise than the German norm prohibiting the employment of children younger than 14 in general. The practiced norms under Sumangali Scheme are ambiguous.

practice	Principles for evaluating behavior						conclusion
	1	2	3	4	5	6	
child employment	U	-	U	U	U	E/U	U

E: Ethical U: Unethical E/U: Ambiguous whether ethical or unethical

Table 2: Applying the Rules of Thumb to child employment (own illustration)

#### 4. Results and Conclusion

Taking stock of the achieved outcomes the application of ISCT has shown that child labour on the one hand is unethical – children younger than 14 working full-time, depriving them of schooling – however on the other hand justifiable where the children attend school and work in their free time. However, in the case of a German importer (trading companies, buying offices, brand-named importer) doing business with an Indian exporter (garment factories) it is morally not acceptable because his or her suppliers are *indirectly* involved in Sumangali Scheme practicing child work under the age of 14 until 18 under exploitative conditions.

Even if not directly involved in questionable activities, Dunfee states “managers must respond to and anticipate existing and changing marketplace morality relevant to the firm that may have a negative impact on shareholder wealth” (Dunfee, 1999, p. 149).

It has to be taken into account that attitudes and behaviors may change over time (Donaldson & Dunfee 1999, p. 148), possibly causing an evolution of norms meaning that the current authentic norm would be cease to be authentic. According the Child Labour (Prohibition and Regulation) Amendment Bill from 2012, the Indian Government *seeks* to prohibit employment of children below 14 years in all occupations except where the child helps his family after school hours (PRS, 2012). This amendment would then be in accordance with the right of education.

It is intended that even light work of children attending school would become illegal and thus illicit for an ethical-minded manager. It is therefore conceivable that the Indian authentic norm towards light child work may change over time. But that is a long way to go.

Further results of this case attract attention:

- First we can state it is difficult to determine a clear agent that we can hold accountable for the practices in the Sumangali Scheme. Each company in the supply chain can point to the responsibilities of a large number of other parties, competitors, exporters, shareholders, government. The issues described, point beyond the responsibility of individual companies. The ‘members of the supply chain’ organizations and individuals have a joint responsibility.
- Second, it can be stated that the hypernorms, the authentic norms of the community and especially the Indian law is clearly infringed by the practices of the Sumangali Scheme. The mill companies point to the fact that they are fulfilling their obligations, they are doing nothing non-illegal behind the factory walls but in contrast as reported by supervisors, it is also known that the control results are frequently faked (SOMO, 2011, p. 14).
- Third, business and the ethical responsibility of a firm should not be seen as isolated islands of economic activity, but as actors operating within a web of businesses, bound by mutual interests and interlinked flow of resources, rewards and ethical responsibilities. As the four cases have shown (Figure 1) one should not restrict the concept of responsibility to individuals and well-structured organization. It is also possible and useful to hold a comprehensive social system responsible for those results that go beyond the intentions and responsibilities of the agents within that social system. The representatives of foreign brands and retailers are also involved into the Sumangali Scheme. So responsible behavior should not only be based on minimum standards and obligations that must be met, but should also

be concerned with the question of how to contribute to the well-being of the community (Wempe, 2009, p. 752).

- Fourth, there is a shift taking place from holding a company later accountable, to the question of how companies can contribute to solving social issues. What is reasonable to expect from an individual company in the supply chain whether retailers or international brands to contribute the social issue of Sumangali Scheme. "The brands and retailers have information about their first-tier suppliers (cut, make and trim units). They are making efforts to understand the supply chain linkages in these suppliers to see if there are any practices which may amount to Sumangali Scheme. In addition, these brands and retailers are also going beyond their first-tier suppliers and identifying the linkages in the mills" (Fair Labour Association, 2012, p. 26). Many of the brands have come together to develop joint actions. "It is a positive sign that all three key sectorial associations i.e., SIMA (The Southern India Mills Association), TASMA (Tamil Nadu Spinning Mills Association) and TEA (Tirpur Exporters' Association), under the banner of TSF (Tirpur Stakeholder Forum) have now come up with guidelines on recruitment and selection of women workers in the textile and garment industry, as well as a code of conduct for hostels, (...) The analysis of the three Guidelines/Codes of Conduct by the three leading associations suggests that while there are positive aspects in each, however, none of them covers all desired aspects" (Fair Labour Association, 2012, pp. 29-30). "A single code would be easy to develop (or benchmark) and will be easier to follow by industry constituents. For brands and retailers, it will be easy to implement in their supply chains and monitor. For civil society organizations, it would be easier to see progress and discuss various aspects of the code for the industry as a whole" (Fair Labour Association, 2012, p. 35). Without any monitoring, it is difficult to assess the impact and feasibility of the guidelines. (SOMO 2013, pp. 2-3)

To turn back to ISCT-approach, one cannot strongly enough emphasize that practitioners applying ISCT on the issue described above may come to a different conclusion because the strength of ISCT is not the "lens view" to focus the ethical issue on a single spot. ISCT is viewing the ethical problem through a "prism" providing a variety of considerations - hypernorms and authentic norms - for solving the ethical dilemma. Based on this "spectrum" of views, the business actor then - for the first time - is able to fully comprehend the problem and its possible solutions (Auchter L., 2014, p. 107).

Secondly the consideration of authentic norms (local norms) tested under the priority rules will result in a profound ethical decision making considering all relevant aspects, especially the distinction between the direct or indirect involvement into an economic transaction. Rather than looking only for universal principles that have to be applied dogmatically in every situation, this pragmatic approach allows for all these aspects to play a role.

Finally, an important feature of ISCT is the distinction between macro and micro contract. The first is a hypothetical contract (macro) which according to the previous analysis defines the normative ground rules for creating the second kind of contract on the micro level. This existing micro social contract facilitates translating the responsibility of the community into a micro social contract. The roles of the actors, weaving/knitting companies, garment factories, retailers and brands, trade unions, but also government and civil society organizations have a shared responsibility for solving the Sumangali problem and the relationships between them can be part of the contents of the micro-social contract. Subsequently the question is emerging how this social system can be governed. Hierarchical steering is not the only possible way but supplemented by self-organization it could be more effective. "A long-term sustainable solution

requires mutual respect understanding, partnerships and joint collaboration to find possible solutions and comprehensive actions” (Fair Labour Association, 2012, p. 35).

### Direction for Future Research

The application of ISCT has identified some deficiencies of the framework which can point out the way for further research focusing on the refinement on the identification of relevant communities the process of identifying authentic norms and hypernorms. Finally the idea of a micro-social contract has to be elaborated more concretely in respect to the governance of a social system.

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# The role of diversification strategies in the economic development for oil-dependent countries: - The case of UAE

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## Keywords

Diversification Strategies, Economic Development, Oil-Depended Economy, Competitiveness.

## Abstract

*Diversification strategies adopted by oil-dependent economies' played an important role in the economic development in these countries, which rely heavily on oil exports. UAE as an oil-dependency economy has the type of strategy to diversify the sources of its national income and reduce its dependence on oil to counter the instability in global oil prices.*

*This paper seek to investigate whether the diversification strategies adopted by (UAE) is adequate to manage its economic development. The methodology employed in this study is to examine the contribution of diversified sectors based on the country's GDP especially during and after the global financial crisis (2008-2012) using statistical analysis procedure. The results confirm that investment in different sectors rather than oil would have substantially improved the performance UAE economy.*

## 1. Introduction

The United Arab Emirates has witnessed substantial development in its economic performance since 1970, despite of the fluctuation of oil price in the last two decades & global financial crises in 2008. The UAE's Minister of Economy – Sultan Al-Mansouri said that the UAE's strategy of diversifying income has helped the country reduce its dependence on oil, & he expected the UAE's GDP to have grown at its forecast rate of 4.5 percent in 2014 (Gulf News Jan.2015). In 2012, UAE experienced considerable improvement in economic performance, which has become more stable in the diversity phase led by a number of Non-oil sectors such as tourism, foreign trade, financial service, and telecommunications sector. Such factors have been reflected positively on the overall growth of GDP and achieved GDP growth by 4.4% in 2012 to reach 280\$ billion in 2011.

Non -oil-sectors contributed to the growth in 2012 by about 3.4% to rise from 182\$ billion in 2011 to 188\$ billion in 2012 and accounted for 67.3% of GDP 2012 (Annual Economic Report 2012) UAE adopted strategy called UAE 2021vision. The aim of this strategy in the economy sector is to build a high competitive knowledge economy, which is divided into 12 national key performance indicators, the first indicator focus on non-oil real GDP growth, the indicator that measures the real annual growth of all sectors except oil. The target of this indicator is to achieve 5% GDP growth by 2021 (UAE vision 2021).

This study examines the relationship between the economic diversification strategies adopted by (UAE) and its economic development.

## 2. Related Literature

An economic diversification strategy is regarded as one of the most important strategies that is used to support economic and business aspects and increases their competitive advantages. Diversification reduces the risks of focusing on a single economic sector or business area which contribute in maintaining the stability even in hard times, and consider as a great tool for business & economic development.

## 2.1 Economic Diversification Strategies

Nowadays diversification strategies are considered as a significant tool for economics to reduce risks. (Heydreich 2012) said that "Research results between 1992 and 2003, have shown that economic diversification based on economic variables can lead to superior geographic diversification" and in order to use the diversification strategies effectively (Al-Hashemi &etal,2012) stated that the diversification of the economy towards non-oil and gas industries is a challenging task that would require cluster based, collaborated and liberalized approach for development between government, industries and foreign investors, in the oil depended economy country, the economic diversification strategy mainly considered developing non-oil sectors and lowering oil financial dependency by creating a viable non-oil modern economy that can sustain a relatively high level of income (Fasano 2003) moreover added that the diversification is important to reduce or spread the risk as well as to promote economic development.

(Hvidt 2013) on the other hand identified three factors "income from hydrocarbons is finite, fluctuates and is practically the only source of the wealth "have placed the issue of economic diversification on the political agenda in the Gulf countries since oil was discovered.

In many cases the objectives & benefits of diversification are under debate. Many authors think that the reasons for diversification include achieving conglomerate power, not meeting of objectives with current portfolio of product / business and responding to opportunities outside of current business, spreading of risks, having excess cash of having slack resources (Akpinar 2009), While in other hand (Nelson and Nelson2003) argued that "The primary purpose of any diversification strategy is to reduce non-systematic risk".

The way to form diversification takes different forms (widest - or narrow) (Armstrong 2008) argued, "The portfolio with the widest diversification will have the lowest risk."

As things stand most of the GCC countries have tried different forms of diversification as a tool of economic development (Karolak 2014) stated that "The beginning of 21st century marked a crucial turn since governments of the GCC countries made a commitment to a sustainable development independent from oil resources and to competitiveness as requirements for future growth of the GCC region overall."

The GCC countries diversified their economics in different sectors, with a major focus key tourism. "The path of economic diversification through development of tourism has proved its success in the United Arab Emirates, especially in Dubai. Statistics indicate that in 2012 tourism accounted for 14% of UAE GDP and 31% of Dubai GDP alone. As a result, UAE has become a global leader in the higher-end leisure market" (WTTC, 2011).

The Gulf States also embarked on large scale economic diversification programs in 1990s and 2000s these created new integrative linkages with the global economy ( ULRICHSEN 2011) moreover he added that the GCC states became world leading center of production for a variety of industries ranging from petrochemicals and aluminum to cements and construction products, according to (Porter 2010) the most competitive issue facing the GCC countries as a whole is increasing economic diversification.

According to (World Bank Report 2013) the oil exporting countries must continue to make reforms that accelerate the pace of Economic Diversification, and invest more in infrastructure to improve the business climate.

## 2.2 Economic Development

There has been many published studies that focused on economic development (Porter 2003) said that the responsibility for economic development shifted from the old model "the



government drives economic development through policy decision and incentives" to the new model "Economic development is a collaborative process involving government at multiple levels, companies, teaching and research institutions",

While others think that the best way to achieve high economic development should be done through economic diversification. (Shihab) states that the successful implementation of human development policy in the UAE hand, to hand with industrialization, urbanization, and modernization, is one of the rare example of a country which has successfully used income from huge natural resources for its long-term development over a short period of time( from early 1970s to late 1990s)

Other approaches find that there is a link between three concepts at which relying on economic diversification enhances competitiveness of countries which finally enables economic development. (Maskell & et al 1998) describe that the economic prosperity of regions or countries is associated with their ability to generate or attract economic activities which are able to increase the income by performing well in the market.

The UAE's National Strategic Goals driven from the VISION 2021 "To enable the UAE to become one of the most competitive countries in the world." Through knowledge economy supported by sustainable and diversified economy.

### 3. Data and methodology

For examining the relationship between the economic diversification adapted by UAE and economic development, the following area of development has been evaluated.

- 1- The contribution of the different diversified sectors in the GDP.
- 2- Value of non-oil sectors comparatively to oil sector during the period (2008 - 2012) through analysis other data obtained from the ministry of Economic and national business of statistics, UAE
- 3- The contribution of the non-oil sector in the Gross Fixed Capital Formation

### 3-1 The UAE Experience of Economic Diversification

#### 3-1-1 Historical Background

The UAE is a federation of seven Emirates was constituted on December 2. 1971. The seven Emirates are Abu Dhabi (The capital), Dubai, Sharjah, Ajman, Fujairah, Ras Al-Khaimah, and Umm Al Quwain. The following table (3-1) showed the population and area of UAE in (2009)

**Table ( 3 - 1 ): Population and Area of UAE (2009)**

Emirates	Population (Persons)	Area in Sq. Km.	Population Density (persons / sq.Km)
Dubai	1.722.000	3.885	443
Abu Dhabi	1.628.000	67.340	24
Sharjah	1.017.000	2.590	393
Ajman	250.000	259	965
Ras Al-Khaimah	241.000	1.684	143
Fujairah	152.000	1.166	130
Umm Al-Quwain	56.000	777	72
Total	5.066.000	77.701	2170

Source & National Bureau of Statistics - Abu Dhabi - UAE

Oil was discovered in Abu Dhabi in the early 1960s and first exported oil in 1962, this dramatically shifted the focus of economy of the UAE and enabled the country to initiate enormous development programs in short period of time.

UAE is considered one of the richest countries in the world and the richest in the Middle East with a high per capita income reaching \$ 44, 952 in 2012(World Bank Report 2013).

**Table (3-2)**  
**GDP - per capita (US\$)**

Country	2008	2009	2010	2011	2012
UAE	45,431	44,873	43,234	43,952	44,440

Source: World Bank Report 2013

According to (IMF 2012) UAE's debt to GDP ratio is the third lowest in the world following Norway and Libya. Currently standing at -93% whilst the world average at 64%

With regard to the oil production now UAE is considered as the Fourth oil producer in the world with 2.5 million barrels a day insert the group.

It is one of the oil producing countries whose economy is mainly based on oil products (Ministry of Energy). UAE leaders have adopted economic diversification as a means of reducing dependence on oil and committed to economic diversification earlier since the oil shock of the 1970s ( Horyo Pestomo & et al 2011).

**Table (3-3)**  
**UAE crude oil production (2008-2012)**

Year	Production	Change
2008	2,681.02	3.01 %
2009	2,412.55	-10.01 %
2010	2,414.66	0.09 %
2011	2,679.18	10.95 %
2012	2,803.61	4.64 %

Source: US Energy Information Administration

During 1970s and 1980s, diversification has been based on the development of capital – and energy – intensive industries as well as the physical and social infrastructure ( Fasano 2003 ) and development of the productive sectors and heavy industry at that time Dubai Aluminum started in 1980 & the other sector diversified in 1980s is the service sector, the creation of free zones in Dubai since the Mid 1980s (beginning with Jabel Ali free zone). (Porter 2003) identified that the 1980s and 1990 the composition of UAE economy change over time and the share of GDP divided by different sectors such as construction, manufacturing, government, services as well as oil, the UAE has reduced its dependence on the oil sector significantly.

The contribution of non-oil sector to GDP from 36.7% in 1980 to 57% 1991(UAE Economic Report 1992)

In the last decade the major aim for UAE government has been to enhance its competitiveness through leverage clusters to organize economic policy, delivery, coordinate government action, and direct diversification efforts (Porter 2010). During the first decade in the third millennium the UAE government has established a strategy named *Vision 2021* which divided into six national priorities, the third one is concentrating on how to build the competitive knowledge economy, and the first indicator is used to measure non-oil real GDP growth, actual results for 2012 for this indicator was 3.5% and the 2021 target will be 5% (UAE *Vision 2021*).

(Shackmurove2004) argued that UAE, although of its energy resources are expected to last for more than 100 years of current rate of production, is recognizing the need for diversification. Currently the UAE is focusing on the development of its service sector and non-oil industrial base. Different emirates have developed their own economic strategies, e.g. Abu Dhabi Economic vision 2030 (Porter 2010).

The Government of Abu Dhabi considers the year 2030 will represent an important milestone for the Emirate of Abu Dhabi. Baseline growth assumptions reveal that Abu Dhabi could achieve tangible levels of economic diversification by the time (the Abu Dhabi Economic vision 2030- 2008). (Lancaster 2011) states that Abu Dhabi, the largest of the UAE's seven Emirates and its most prosperous owing 95% and 92% of the country's considerable oil and gas wealth, is moving into a new era of economic diversification and he added "vision 2030 is essentially a road map for greater diversification away from the country hydrocarbon-dominated economy. Mubadala Development Company, the strategic investment arm of Abu Dhabi government, continues to play a major role in the region's industrial development, including a wide range of projects, among them commerce, finance, energy and leisure."

In December 2014 Dubai launching its plan 2021 to begin a new phase of sustainable and systematic development in all vital sectors in the Emirate of Dubai ( Gulf News Dec. 2014). The Dubai plan aims to align itself with UAE vision 2021 and the national agenda key performance indicators and complement Dubai strategic plan 2015 (WAM Dec. 2014).

This paper examines the relationship between the economic diversification strategies adopted by UAE and economic development. The methodology used in this study to examine the contribution of selected diversified sectors (construction, manufacturing, service, and tourism and Non-oil sectors) based on the country's GDP especially during and after the Global financial crisis (2008 - 2012) using statistical analysis procedures.

### 3-1-2 contribution of oil & non-oil sectors to GDP (2008 - 2012)

The information for this analysis appearing in the following table (3-4) shows such information needed to evaluate the contribution of oil and non-oil sectors to (GDP) during the period (2008-2012).

**Table (3-4)**  
**Contribution of oil & Non-oil sectors to GDP (2008 - 2012) (in million AED)**

Sector	2008	2009	2010	2011	2012	average
<b>Total GDP</b>	977.4	930.5	946.4	982.7	1.025.6	977.52
<b>Non-oil sector GDP</b>	664.6	645.6	650.2	667.3	690.3	663.68
<b>Contribution of oil sector to GDP</b>	312.8	284.9	295.8	315.4	335.3	308.84
<b>Contribution of Non-oil sector to GDP %</b>	68.0%	69.4%	69.5%	67.9%	67.3%	68.42
<b>Contribution of oil sector to GDP %</b>	32.0%	30.6%	30.5%	32.1%	32.7%	31.58

**Source: National bureau of statistics**

In 2009 the GDP rate of growth for (UAE) reduced to 4% due to the global financial crisis and the decrease of oil price from \$ 91.48 in 2009 to 53.48 in 2009. Although the non-oil sectors contribution increased from 68% to 69.4% in 2009 and 69.5 in 2010 respectively indicating that the non-oil sector plays an important role in the economic development of (UAE).

In 2011 and 2012 the contribution of non-oil sectors witnessed a small decrease to the 67.9% and 67.3% respectively while the oil sector contribution to the GDP increased from 32.1% in 2011 to the 32.7% in 2012 due to the increase of oil price from 53.48% in 2009 to the 71.21 in 2010 & 87.04 in 2012, and 88.95 in 2012 (inflation data.com November 2014).

From the above data in table (3-4) non-oil sectors maintain approximately the same high level of contribution to the GDP during and after Global financial crisis and it was not affected by the decrease and increase of oil price at the period of analysis, as an average in the period of study (2008 - 2012) the non-oil sector contributes to the UAE's GDP by 68.42.

### 3-1-3 Sectors Contribution to UAE's GDP (2008 - 2012)

As far as the information about the sectors contribution to UAE's GDP during the period of the study (2008-2012) is considered, the analysis of data is concern about evaluating the contribution of each sector to the overall UAE's GDP and identify the major players. Table (3-5) shows the sectors contribution to UAE's GDP (2008-2012)

**Table (3-5)**  
**Sector Contribution to UAE's GDP (2008 - 2012) (in million AED)**

Sector	2008	2009	2010	2011	2012	average
Oil & natural gas	32.0%	30.6%	30.5%	32.1%	32.7%	31.58
Agriculture, Livestock & Fishing	0.9	0.9	0.8	0.7	0.7	0.8
Mining and quarrying	0.3	0.3	0.3	0.3	0.3	0.3
Manufacturing	8.6	8.5	8.8	9.2	8.9	9
Electricity, gas and water	2.5	2.5	2.5	2.7	2.7	2.58
Construction	11.1	11.2	11.1	10.4	10	10.8
Whole sale and retail trade and repairing service	13.2	13.3	13.4	13	12.5	13
Restaurant and hotels	1.8	1.9	1.8	1.9	1.9	1.86
Transport, storage and communications	9.4	9.4	9.2	9.3	9	9.26
Real estate & business service	10.2	10.6	10.2	10.2	10.5	10.34
Social & personal services	2.2	2.2	2.2	2.3	2.5	2.28
Financial corporations	6.3	7.4	6.2	6.7	7	7.1
Government services	4.6	4.7	4.6	4.7	5.5	4.82
Domestic level of household	0.5	0.4	0.4	0.4	0.4	0.42
Less imputed bank service	3.6	3.9	2.4	3.9	4.6	4.14
Total	100%	100%	100%	100%	100%	100%

**Source: National bureau of statistics - Abu Dhabi - UAE**

From table (3-5) it can be observed that the oil and gas sector contributed to UAE's GDP by an average of 31.58 in the period of analysis (2008 - 2012), while the non-oil sector contributed by 68.42 during the same period divided into different sectors, which reflects a measure of the effectiveness of economic diversification strategies adopted by UAE.

The wholesale and retail trade and repairing service sector has the higher share among the other sectors (13%), followed by construction sector by about (11%), then the real estate and business service by about (10.5%).

The transport, storage and communication contribution rate reached about (9%), manufacturing contributed by some rate (9%).

Also we can observe that the service sector (whole sale and retail trade and repairing, real estate and business service, transport, storage and communications, social and personal services, and hotel and restaurant). All together achieved the highest contribution to GDP by about (37%) comparing to other non-oil sectors.

- a. Construction ( 11% )
- b. Manufacturing ( 09% )
- c. Financial Corporation ( 07% )
- d. Government Service ( 05% )

- e. Electricity, Gas & Water (03%)
- f. Agriculture, Live Stock & Fishing (0.8%)
- g. Mining Quarrying (0.3%)

The highest contribution of the service sector was affected by the movement of financial resources to the service sector specially the tourism by building many tourism infrastructures such as (Khalifa Tower, World Tallest Building, Dubai Mall, The Mall of Emirates, Yas Island which include Ferrari world & Yas water world and Formula 1 Circuit Abu Dhabi).

To meet the increased demand for the tourism services, a lot of branded hotels and restaurants have been developed; in 2010 alone there were 10 million visitors to Dubai, and Dubai's strategic plan is to increase the number of tourists to 15 million by 2015 (MEED)

According to the travel and tourism competitiveness report issued in World Economic Forum by in 2014 the UAE was placed in the 28 rank among the countries covered by the report (140 countries) and at the First rank among GCC countries, the following table (3-6) illustrate this information.

**Table (3-6)**  
**The Travel & Tourism Competitiveness Report (GCC Countries)**

Country	2013 Ranking
UAE	28
Qatar	41
Bahrain	55
Oman	57
Saudi Arabia	62
Kuwait	101

**Source: World Economic Forum report 2014**

Construction is the highest contributor for the rest of the non-oil sector, this is because of the development of tourism infrastructure (shopping malls, hotels, leisure, and sport complexes) and real estate sector. Dubai & Abu Dhabi observing the highest rate of construction projects in UAE followed by Sharjah, Ajman, Ras Al-Khaimah, Fujairah, and umm Al-Quiwin respectively. There are more than 6.000 construction companies operating in UAE, but the major market key players are:

- Nakheel, Emmar, and Dubai properties and Damac in Dubai.
- AlDar properties and Soroush Real Estate in Abu Dhabi.
- Al Hanoo holding company and Burooj properties in Sharjah.

The drivers for increasing growth of this sector is the highest demand for the real estate units due to the growing expatriate population, an ideal investment climate with high degree of flexibility and attractiveness and effective economic and investment policies attracts multi-national companies to expand their business in UAE

The second contributor in the non-oil sector rather than service is the manufacturing sector which contributes by about (9%) as an average rate during the period of (2008-2012). Manufacturing sector includes a lot of industries areas such as; petrochemicals, metals, pharmaceuticals, as well as aviation industry. Financial corporations contribute about (7%), there are 50 banks in the UAE, about half of them domestic and half are foreign (Ministry of Economy 2014) and in addition to that, UAE hosts two stock exchanges: the NASDAQ DUBAI, and ABU AHABI Securities Market (ADSM).

The agricultural, livestock and fishing sectors are small and their contribution to the GDP with Mining & Quarrying by (0.8%) and (0.3%) respectively. Although the agriculture

industry in the UAE is diversifying quickly, it is still at the lowest level of contribution to GDP – its main exports include dates fish, vegetables, eggs, and dairy products.

### 3-1-4 Gross Fixed Capital Formation by the Economic Activities

This section used to analyze the structure of the investment distributed among the different diversified sectors, it is noticed that the non-oil sector played the major role of the constitution of Gross Fixed Formation which consistent with the contribution of these sector to GDP

Table (3-7) shows the Gross Fixed Capital Formation by Economic Activities (2009 – 2012)

**Table (3-7 )**  
**Gross Fixed Capital Formation by Economic Activities**  
**(2009 – 2012)\* (in million AED)**

Sector	2009	2010	2011	2012	Average Annual growth 2009-2012	Contrib ution %
Non - Financial Corporation	206.937	215.873	234.154	257.185	7.5%	83%
Agricultural, livestock, fishing	918	775	837	927	0.3%	0.3%
Mining & Quarrying Activies	38.078	38.047	30.480	34.261	-3.5%	11%
* Oil & Gas	37.826	37.690	30.111	33.875	-3.6%	10.9%
* Quarrying	252	357	369	386	0.15%	0.1%
Manufacturing Activity	35.695	40.336	40.809	45.583	10.6%	14.7%
Electricity, Water, and Gas	28.272	22.736	22.575	42.336	-4.9%	7.9%
Construction	11.438	13.718	11.965	12.503	3%	4%
Wholesale, and retail trade, advertising Service	10.396	12.340	12.817	13.548	9.2%	4.4%
Restaurant and Hotels	4.661	4.097	4.270	4.847	1.3%	1.7%
Transport, Storage and Communication	29.754	32.068	44.421	49.974	18.9%	16%
*Transport, Storage other Communication	24.845	28.636	37.382	42.656	19.7%	13.8%
* telecommunication	4.909	3.432	7.039	7.609	15.7%	2.5%
Real Estate & Business Service	41.911	43.190	52.086	55.159	9.6%	17.8%
Social & Personal Service	5.814	8.567	13.893	16.046	40.3%	5%
Financial Corporation	5.011	7.472	5.298	5.695	4.4%	1.8%
Government Service	57.276	39.230	42.238	46.293	-6.7%	15%
Total	269.224	262.575	281.690	309.173	4.7	

Source: National bureau of statistics – Abu Dhabi – UAE

\*2008: N / A

Table (3-7) reveals that gross fixed capital formation grew by annual average of 5% during the period (2009 – 2012), whereas increased from 269.224 million dirhams in 2009 to 309.173 in 2012.

Also we can observe from the table above that the oil-sector contributed to the gross fixed capital formation by only (11%) in 2012 while the investment has been concentrated in four sectors of economic diversification by (64%) including :

- Real Estate (18%)
- Transport and Storage (16%)
- Manufacturing (15%)

- Government Service (15%)

### 3-2 UAE Economic Development

This part of the study provides insights into the area of the UAE economic development based on analysis of the competitiveness as a framework for economic development. As a result of the successful economic diversification strategies adopted by the UAE which concentrate “to enable the UAE to become one of the most competitive countries in the world” (UAE Vision 2021) the United Arab Emirates was ranked in the advance places in different classification, a report issued by the World Economic Forum for the year 2009-2010, the mid period of the study, ranks UAE comparatively to the Arab World and Worldwide as the following:

- First, among Arab counties in terms of economic liberalization
- First, in the classification of countries most integrated in globalized economy
- Third, in the world in terms of the appropriate economic climate for entrepreneurs

Statistics issued by a report on Doing Business in 2010 indicated that the UAE has occupied the following ranks:

- The 44th for the year 2010, in (project startup) after having been ranked 118th in 2009.
- The 33rd for the year 2010, in (Doing Business), compared to 47th in 2009.
- The 5th for the year 2010, in (cross-border trade), compared to 13th in 2009

UAE has achieved recently high standard rates of overall development in various fields, putting it at the top centers in the reports of the regional and international specialized institutions, especially in the indices of global competitiveness reports, which were classified in the best developed countries in the world lists ranked all most, as the first among Arab Countries, the following table (3-8) shows some of the recent standing (2013-2014)

**Table (3-8)**  
**UAE current Standing (2013-2014)**

Report name	Global Ranking	Regional Ranking	Report Date	Published By
The World Competitiveness Yearbook	8 ▲	1 —	2014	World Economic Forum
World Happiness Report	14 ▲	1 —	2013	Earth Institute/Columbia University
The Global Competitiveness Report	12 ▲	1 ▲	2014	World Economic Forum
The Global Information Technology Report	24 ▲	2 —	2014	World Economic Forum
Doing Business Report	23 ▲	1 ▲	2014	World Bank
The Travel and Tourism Competitiveness Report	28 ▲	1 —	2013	World Economic Forum
<u>Prosperity Index</u>	28 ▲	1 —	2013	Legatum Institute
The Global Enabling Trade Report	16 ▲	1 —	2014	World Economic Forum

Source: Emirates Competitiveness Council Dubai, United Arab Emirates

### 4. Conclusions

Based on the data analysis of the contribution of diversified sector (Non-oil sector) at UAE's GDP and gross fixed capital formation, we can conclude that the UAE government realizes that it is important for the economic development to have other income source rather than oil. Despite the global financial crisis and the fluctuation of oil price during the study period (2008 - 2012), the UAE managed to overcome the negative impact through emphasizing

more economic diversifications which support the country's economic development and the competitiveness, which put the UAE in the first rank in its region.

It is evident that the non-oil sector contributes to UAE's GDP by around 70% and four sectors from the diversified sector contribute to the gross fixed capital formation by around 64%. It is also clear that the UAE development and competitiveness continuously enhanced according to the international competitiveness measure. It can be observed that some sectors achieved a smaller contribution to the UAE economy such as agriculture, livestock & fishing which contributed by less than 1%, Mining and Quarrying 0.3%.

It is recommended that, the government should invest more in these less contributing sectors to increase their role in the UAE economy.

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## Correlates of state government finances and the Nigerian economy

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### Key words

Correlates, state government finances, Nigerian economy, Gross Domestic Products

### Abstract

*This study investigated the correlate of state government finances and the Nigerian economy. To achieve this purpose research question was raised, a review of literature was made and a hypothesis was developed. In generating the necessary data for the study, state government finances was operationalized as state internally generated revenue while the Nigerian economy was measured by Gross Domestic Product (GDP). The records were obtained from the Central Bank of Nigerian Statistical Bulletin of various years. In analyzing the data generated from this study, the simple percentages and regression analysis were adopted. The result of our analysis indicates that from 2010 to 2014, the percentage of SGR to GDP is 41.64%, which means that the degree of state government finances in Nigeria is low. On the relationship between state government finances and the Nigerian economy, the analysis shows a correlation co-efficient of 0.493 and a p-value of 0.965. This suggests that though a moderate relationship exists between state government finances and the Nigerian economy, the impact is insignificant. Based on these findings, it is recommended that state governments in Nigeria should intensify efforts in their revenue mobilization and ensure that all sources of revenue stipulated in the 1999 constitution are adequately tapped. This in the long-run has the potential to bring about financial independence.*

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### Introduction

Within the last decades issues of domestic resource mobilization has attracted considerable attention in many developing countries including Nigeria. In the face of unabated debt difficulties, coupled with the domestic and external financial imbalances confronting them, it is not surprising that many developing nations have been forced to adapt stabilization and adjustment policies and increase revenue which demand better and more efficient methods of mobilizing domestic financial resources with the view of achieving financial stability and promoting economic growth. Taxation plays a significant role in achieving this purpose. According to Opuene (2006), taxation is the imposition by the government of a compulsory levy on the income, profit, property, or the expenditure (consumption) of an individual, family, community, firms or corporate bodies so as to enable the government carry out its economic and social responsibilities to the citizenry.

In a federation like Nigeria, the concept of inter-governmental fiscal relations subsists, and the government fiscal power is based on three-tier tax structure - federal, state, and local governments, each of which has different tax jurisdiction for the enactment of tax laws, formulation of tax policies, and tax administration (Adesola, 2004). In 2002, about 40 different taxes and levies are shared by all three levels of government. Each tier of government has the sphere clearly spelt out in the Taxes and Levies (approved list for collection) Decree, 1998. The most variable taxes are under the control of the federal government while the lower tiers are responsible for the less buoyant sources, which imply that the federal government tax corporate bodies while the state and local governments tax individuals. According to Odusola (2006), the Nigeria's tax system whether at the federal, state or local levels is characterized by unnecessary complexity, distortion and largely inequitable tax laws that have limited application in the

informal sector. Promulgation of Decree No. 7 of 1975 set aside federalism in Nigeria taxation which limited the independence of state governments in the enactment of tax laws. State Assemblies were not involved to defend their limited independence to make tax laws as the peculiarities of their states might dictate. Consequently, the federal government on average accounts for 90 percent of the overall tax revenue annually, but only accounts for about 70 percent of total government expenditure (Naiyeju, 2010; Odusola, 2006).

According to Philips (1997), the breakdown of total tax and levy collection of the three tiers of government was 96.4 percent for the federal government, 3.2 percent for the state government and 6.4 percent for the local government. The above analysis clearly demonstrates that much is yet to be done to improve state government tax revenue in Nigeria. In addition, the ever increasing financial needs of states compelled state governments to imbibe the culture of improving internally generated revenue as alternative means of meeting and sustaining the various competing financing needs. It is upon this premise that this study tends to examine the correlates of state government finances and the Nigerian economy. This necessitates the question, what is the degree of state government finances in Nigeria? Based on the above, it was hypothesized that state government finances have no significant influence on the Nigerian economy.

### Literature Review

A large body of research indicates that high marginal tax rates reduce economic growth. Two studies completed by Padovano (2001) and Gali (2002) confirm the negative effects of high marginal tax rates on economic growth. Using data from 23 OECD (Organization for Economic Co-operation and Development) countries from 1951 to 1990, Padovano (2001) and Gali (2002) found that high marginal tax rates and progressive taxes trended to be negatively associated with long-term economic growth. In 2002, they followed up their original study and found that an increase of 10 percentage points in marginal tax rates decreased the annual rate of economic growth by 0.23 percentage points. Additional studies corroborate the finding that high and increasing marginal taxes negatively affect economic growth. For example, Reinhard, Koester and Roger (1989), using data for 63 countries during the 1970s, found that reducing the progressivity of the tax system while allowing the government the same tax revenue led to higher levels national income.

Similarly, Mullen and Williams (1994), using data from US states from 1969 to 1986, examined the impact of state and local tax structures on the economic performance of states. They concluded that "lowering marginal tax rates can have a considerable positive impact on growth" and that "creating less confiscatory tax structure, while maintaining the same average level of taxation, enables sub-national government to spur economic growth.

Engen and Skinner (1996) revealed evidence on tax rates and economic growth in the United States and -internationally. They concluded that "a major tax reform reducing all marginal rates by five percentage points, and average tax rates by 2.5 percentage points, is predicted to increase long-term growth rates by between 0.2 and 0.3 percentage points". More so, Romer and Romer (2007) analyzed the impact of changes in the level of taxation on economic growth. In this important study, the authors investigated the effects of tax reforms on GDP in the United States in the post-world War II period. The study found that such tax changes had very large effects on GDP-a tax increase equivalent to 1% or GDP lowered output (as measured by real GDP) by roughly 2% to 3%.

Labour supply increases as tax decrease taxes are an important determinant of labour supply. By changing the returns (in the form of the after-tax wages) to employees, taxes

influence labor force participation and the number of hours worked. Numerous studies provide compelling evidence that taxes reduce labour supply, both in terms of hours worked and participation in the workforce. An important contribution was recently made by Prescott (2004). Prescott examined the role of marginal tax rates in accounting for changes in hours worked and employment income for the working age population (people aged 15 to 64 years) in the G-7 countries for the periods of 1970 to 1974 and 1993 to 1996. He found that, during these two time periods, differences in marginal tax rates accounted for a large part of the differences in hours worked in the United States and several European countries. Similarly, Davis and Magnus (2004) recently completed a study that investigated the effects of national differences in tax rates on employment income, payroll, and consumer spending. The authors posited that higher tax rates reduce the reward for work and, thus, decrease work time in the private sector and increase the size of the underground economy. After examining data from 16 industrialized countries during the 1990s, they found that a tax rate increase of 12.8 percentage points led to 122 fewer hours worked per adult per year, which translated into a decline of 4.9 percentage points in total employment and an increase in the underground economy of roughly 3.8% of GDP.

A study by Cardia et al (2003) supports these findings, it strongly suggests that taxes can account for most of the changes in hours worked both over-time and across countries. One of the most influential studies on the relationship between taxes and investment is that by Hall and Jorgenson (1967). The authors calculated the effects of changes in tax policy on investment behavior in the United States after three major tax revisions following the Second World War. They found that tax policy was highly effective in changing the level, timing, and composition of investment.

Fazzari, Hubbard, and Bruce (1988) analyzed the effects of taxes on capital spending. The authors investigated whether marginal or average tax rates had an impact on capital investment. They found that lower average tax rates increased the amount of earnings firms would make. The authors analyzed the impact of high and increasing marginal tax rates for reinvestment in capital. They observe that changes in income tax rates reduce economic growth by 4.6%. Mullen, and Williams (1994) examined changes in the United Kingdom's tax policy from 1978 to 1992, and the impact of those changes on labour supply. They concluded that increases in after-tax wage levels had a positive impact on hours worked.

In a more recent study, Carroll, Davis and Smith (1998) explained trends in average hours worked by the working age population (people aged 15 to 64 years) across 21 OECD countries from 1956 to 2004. They concluded that average hours worked has fallen substantially in most OECD countries over the period average hours worked by the working population in 2004 were almost 20% below their 1956 levels. The authors found that income and consumption taxes better explained the decrease in hours worked than other factors such as labour regulation and the size and duration of unemployment benefits. High taxes mean less investment. Investment is important for a nation's future wellbeing. High marginal tax rates lower an investor's willingness to invest by lowering the returns on his investment. A reduced amount of investment has a number of negative consequences; including decreased productivity of marginal tax rates have a more important influence on firms' investment decisions. For such firms, lower marginal tax rates reduced the cost of new investment and stimulated capital investment. Stum and Sparoh (2011) provided empirical evidence regarding the influence of business taxes on capital investment. The study used American tax reforms as natural experiments to estimate the responsiveness of investment in fixed assets. The authors concluded that investment changed significantly subsequent to every major business tax reform since 1962.

Stum and Sparoh (2011) investigated the impact of tax reforms on investment using a cross-country comparison. The authors examined the impact of tax reforms on the investment decisions of over 3,000 firms from 1981 to 1992 in 14 OECD countries. The authors found that changes in tax policy affected investment levels in 12 of the 14 countries.

In addition, Carroll, Davis and Smith (1998) found that a five percentage point rise in marginal tax rates would reduce the proportion of entrepreneurs who make new capital investment by 10.4%. Further, such a tax increase would lower average capital investment by 9.9%.

### **An Overview of the Nigerian Economy**

Nigeria gained her political independence from Great Britain in 1960 with high hopes for a society that would guarantee rapid economic, social and political progress. From 15th January, 1966 to 31st September 1979, the nation had been under military dictatorship regimes. It is important to know that from 1st October 1979, to 31st December 1983, Nigeria practiced the American type of democracy. However, this democracy fell on 1st January 1984 when Nigeria witnessed yet another era of military regime. A democratically elected Government was sworn in on 29th May 1999. It is the hope of Nigerians that the military will restrict themselves to their constitutionally defined roles. It was expected that the economy would usher in high standard of living for its citizens. To this effect, a lot of effort was put into designing and establishing appropriate economic strategies through the various National Development Plans. Specifically, the Government undertook substantial investment in industries, social services and infrastructure in order to accelerate the pace of economic growth and development. At that time, expectations were heightened by exploration of huge oil reserves which included sharp increases in foreign exchange earnings and government revenue. The so-called oil boom produced profound changes in the investment, production and consumption patterns of the country. It also led to fundamental changes in the socio-cultural values, political arrangements, mode of economic management as well as the policies and programmes that were embarked upon in the period, (Central Bank of Nigeria, 1993).

It must be noted that the Nigerian economy is still primarily agrarian, yet about 90% of the country's foreign exchange earnings is generated by the oil sector and about 70% of the Federal Government revenue is also derived from the oil sector. But the share of the agricultural sector in the GDP is 31%. This is about thrice of the sector. However, because of low productivity in agriculture, 59.65% of total labour force is employed in the sector. The relative shares of employment by other sectors are 14.98% in Chemical-Petro-Chemicals, 4.01% in Construction, 3.13% in basic industries, 2.06% in public utilities, 6.04% in Government, and 10.27% others. The manufacturing sector in spite of it contributing less than 10.01% contribution to the GDP has the greatest potential for employment generation. One of the major manifestations of the gravity of the nation's economic depression is the increasing lack of capacity to create new jobs or maintain existing ones. The continued inability of the economy to provide employment, the existence of a large number of unemployed unskilled labour and the resultant social and economic consequences has made it imperative that job creation and occurrence should be the primary objectives of economic recovery programmes. Unfortunately, the implementation of the policy objectives of job-creation in the past had been unsuccessful. Specifically, the IMF-World Bank Structural Adjustment Programme (SAP) embarked upon since 1986, instead of creating new employment has even reduced the existing low level of employment and output. Furthermore, the deregulation of both interest and exchange rates had

led to high cost of production. This has resulted in high prices, thereby reducing the purchasing power of the population.

More importantly, the stock of unsold goods has risen and a reasonable number of business enterprises have folded, industrial investment has drastically declined and capacity utilisation fell from 70.0 percent in 1986 to 29.0 percent in 1995. This unpleasant situation was aggravated by dumping that has adversely affected a large proportion of the Nigerian populace. Many people have not only become discouraged and marginalized but have been existing and continue to exist a standard of living which denies them the attainment and enjoyment of individual and social basic needs and self-reliance. In spite of these economic and social crises arising primarily from the introduction and implementation of the SAF the IMF-World Bank still put pressure on Nigeria to continue with SAP (Muyi, 2006).

The oil boom of the 1970s placed Nigeria into the class of countries with higher per capita income. However, since then, the oil market has weakened and the foreign exchange earnings from the dominant sector eventually declined substantially. Consequently, Nigeria has once again been regrouped into the countries with low per capita income. The economic crisis is not only that of low per capita income but also that of macroeconomic instability characterized by high inflation rate, sharp depreciation of the national currency, high unemployment rate, and balance of payments disequilibrium. These problems resulted because of Nigeria's continued dependence on the export of crude oil for foreign exchange earnings and Government revenue (Ndukwe, 1991).

As in many Sub-Saharan African countries, Nigeria's experience has also proved that public sector intervention can result in failure in achieving desired objectives. The main argument in support of Government intervention is based on the inherent failure of price mechanism to evolve a stable equilibrium in the market economy, (CBN, 2000). Since the attainment of independence, the Nigerian Government had adopted and implemented four Development Plans between 1980 and 1985. The country adopted the IMF World Bank Structural adjustment Programme (SAP) in July 1986. As Gbosi (2004) observed, the primary objectives of the SAP were: to restructure and diversify the production base of the Nigerian economy; lay the basis for sustained growth; improve fiscal and balance of payments stability; limit unproductive elements in the public sector to improve the sector's efficiency and intensify growth of the private sector; and establish a realistic and sustainable exchange rate for the naira; and reduce the debt burden and attract a net inflow of foreign capital, while keeping a lid on foreign loans.

These objectives were to be achieved through the main instruments of the SAP which included trade and payments liberalization, tariff reforms, adoption of tight fiscal and monetary policies to mop excess liquidity and commercialization and privatization of public enterprises. Thereafter, the country adopted three years rolling plans. These objectives were designed to promote rapid economic growth and development and also to bring about significant improvement in the living conditions of the people. Over the years, the results of the Government's role in economic activities and achievements in economic performance in Nigeria have been mixed. For example, the country experienced growth in real output in some years and declines in other years. However, the over-all picture is that of low scoring for the country's development efforts. Specifically, the economic crisis from the 1980's and early 1990's brought out clearly the difference between growth and development. A country may achieve growth of GDP without economic development. The data in Table 1 is used to highlight Nigeria's economic performance over the period, 1970 - 2000.

**Table 1: Macroeconomic Trends**

Year	Federal Fiscal Overall (N Million)	Inflation %	Growth Rate of GDP	Net Foreign assets (N Million)	Real Exchange Rate	Interest Rate %	Real Interest Rate
1970	(460.0)	13.80	46.80	150.0	-	7.00	(6.80)
1971	170.0	15.71	26.33	280.0	-	7.00	(8.74)
1972	(59.0)	28.60	8.45	240.0	-	7.00	(21.60)
1973	166.0	5.71	59.09	410.0	-	7.00	1.29
1974	1,796.0	12.61	60.00	3,560.0	-	7.00	(5.61)
1975	(428.0)	33.60	17.09	3,670.0	-	6.25	(27.35)
1976	(1,091.0)	24.55	24.66	3,400.0	-	6.50	(18.05)
1977	(781.0)	13.45	17.41	2,960.0	-	6.00	(7.45)
1978	(2,822.0)	22.03	7.32	1,420.0	-	6.75	(15.28)
1979	1,461.0	11.46	19.03	3230.0	-	7.79	(3.67)
1980	(1,975.0)	10.28	18.62	5,610.0	-	8.43	(1.85)
1981	(3,902.0)	20.62	40.29	2,560.0	-	8.92	(41.70)
1982	(6,104.0)	7.73	2.36	1,060.0	-	9.54	1.81
1983	(3,364.0)	23.26	9.99	810.0	-	9.89	(13.28)
1984	(2,660.0)	39.51	11.32	1,420.0	-	10.24	(29.27)
1985	(3,039.0)	7.46	13.76	1,820.0	-	9.43	1.97
1986	(8,254.0)	54.76	0.97	4,460.0	-	10.50	4.74
1987	(5,889.0)	11.23	49.03	6,870.0	-	13.96	2.73
1988	(15,134.7)	54.50	33.39	7,970.0	-	16.30	(38.20)
1989	(12,160.9)	50.49	54.78	1,8230.0	-	20.44	(30.05)
1990	(22,116.1)	7.35	15.94	41,320.0	-	25.30	17.95
1991	(35,755.3)	13.02	24.31	54,000.0	-	20.04	7.02
1992	(35,645.3)	44.58	69.69	39,390.0	-	24.76	(19.82)
1993	(107,270.0)	57.17	26.79	58,710.0	-	31.65	(25.32)
1994	(70,270.0)	57.04	31.25	55,994.5	-	20.48	(36.56)
1995	1,000.0	72.80	116.16	108,655.8	76.67	20.24	(52.56)
1996	37,049.1	29.30	42.79	148,982.9	81.66	19.70	(9.60)
1997	(5,000.0)	8.50	4.09	221,952.0	82.02	18.40	(9.90)
1998	(13,338.9)	10.00	(3.48)	209,136.2	84.22	18.30	8.30
1999	(285,104.7)	6.6	2.8	666,271.2	92.65	20.53	13.9
2000	(103,777.3)	6.9	3.8	1,275,016.9	63.3	21.32	14.4

Source; Gbosi (2004)

### Methodology, Analysis and Results

This study focused on State Government Finances and the Nigerian Economy for the period of 2010-2014. While state government finances were operationalized as state internally generated revenue, the Nigerian economy was measured by Gross Domestic Product (GDP). The records were obtained from the Central Bank of Nigerian Statistical Bulletin of various years. In analyzing the data generated from this study, the simple percentages and regression analysis were adopted, which was computed with the aid of the Statistical Package for Social Sciences (SPSS) version 17.

The model specification and estimation for this study is as designed thus:

$$\text{GDP} = f[\alpha_0 + \beta \text{LogSIGR}]$$

Where GDP = Gross Domestic Product

SIGR = State Internally Government Revenue

$\alpha_0$  = Regression Constant  
 $\beta$  = Regression Co-efficient

The respondents were asked to indicate the degree of state government finances in Nigeria, and the result obtained is presented in the Table 2 below.

**Table 2: Degree of state government finances in Nigeria**

Year	SIGR (in millions of naira)	GDP ( in millions of naira	% of SIGR to GDP
2010	12031	33985	35.4
2011	13387	37330	35.9
2012	16523	40544	40.75
2013	20359	37286	54.60
2014	15955	38387	41.56
<b>Average</b>			<b>41.64</b>

**Source:** SPSS Version 17 Windows Output

The data presented in the table above indicate the degree of state government finances (SIGR) in relation to GDP. In 2010, the percentage of SIGR to GDP was 35.4%; in 2011 it was 35.9%; in 2012 it was 40.75; in 2013 it was 54.60; and in 2014 it was 41.56%. From 2010 to 2014, the percentage of SIGR to GDP is 41.64%. This implies that the degree of state government finances in Nigeria is low.

In testing the stated hypothesis, Gross Domestic Product (GDP) was regressed against State Internally Generated Revenue (SIGR), and the result obtained is shown in the Table 3 below.

**Table 3: Impact of State Government Finances on the Nigerian Economy**

Model	R	R Square	F	Sig.
1	.493 <sup>a</sup>	.243	.965	.398

**Source:** SPSS Version 17 Windows Output

The Table above shows a correlation of 0.493 which is close to zero from the positive side. This suggests there is a moderate relationship between state government finances and Nigerian economy. But the F-ratio of 0.965 and probability of 0.398 indicate insignificant impact. It therefore implies that state government finances have no significant impact on the Nigerian Economy.

## Conclusion and Recommendations

The ever increasing financial needs of states governments compelled them to imbibe the culture of improving internally generated revenue as alternative means of meeting and sustaining the various competing financing needs. Although there are several sources of revenue to the state government, most of the sources of state governments tax revenue are untapped particularly the miscellaneous sources thereby under-mining their revenue generation efforts. The tax system in most states of the federation is seen as an embodiment of contention and controversy whether in its policy formulation, legislation or administration. As a result, the role of taxation in promoting economic activity and growth is no more felt. Similarly, the literature has equally suggested that state income tax levels have impact on economic growth. States with low tax rates are more successful in the collection of taxes as the rate of evasion is low, compared to states with high tax rates.

The result of our analysis indicates that from 2010 to 2014, the percentage of SIGR to GDP is 41.64%, which means that the degree of state government finances in Nigeria is low. The implication of this is that a greater proportion of state government revenue comes from



statutory transfers. On the relationship between state government finances and the Nigerian economy, the analysis shows a correlation co-efficient of 0.493 which is close to zero from the positive side and a p-value of 0.965. This suggests that though a moderate relationship exists between state government finances and the Nigerian economy, the impact is insignificant. Based on this discussion and the conclusion drawn there from, it is recommended that state governments in Nigeria should intensify efforts in their revenue mobilization and ensure that all sources of revenue stipulated in the 1999 constitution are adequately tapped. This in the long-run will bring about financial independence.

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#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.493 <sup>a</sup>	.243	-.009	2381.10173

a. Predictors: (Constant), SGR

#### ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5473484.870	1	5473484.870	.965	.398 <sup>a</sup>
	Residual	1.701E7	3	5669645.443		
	Total	2.248E7	4			

a. Predictors: (Constant), SGR

b. Dependent Variable: GDP

#### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31805.128	5899.435		5.391	.013
	SGR	.364	.371	.493	.983	.398

a. Dependent Variable: GDP

## Operating revenue changes in a demutualized stock exchange

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### Keywords

Demutualization, Stock Exchanges, Revenues, Panel data model and regression.

### Abstract

*Stock exchanges were traditionally run as cooperative venues. The globalization, the development of technology, and the increase of competition among stock exchanges forced these venues to change their structure and adopt a new one-demutualization- that can be a lifeline in facing these environmental changes in regards to stock exchanges. This new trend enables the exchange to expand their activities and supply the market with new products and services, therefore enhancing the value of the exchange itself.*

*The main sources of revenue for traditional exchanges have been listing fees, transaction fees, membership fees and the sale of information services such as market data, quotations, and trade data. Due to the environmental changes the stock exchanges' services are now executed electronically, and in turn, this has led to an increase in the competition among exchanges. Furthermore, this increased competition has led to the re-adjustment of the regulation structure which gradually erodes the sources of revenues provided by the conventional stock exchanges.*

*The paper divided the research plan into two sections: the first section is to highlight the concept of demutualization process; the phases of demutualization, the factors that push the stock exchanges to demutualize and the benefits of demutualization. The second section was based on statistical comparative analysis of the stock exchanges' revenues prior and after demutualization. The researcher used the regression analysis tool on seven demutualized stock exchanges during the period from 1997-2012.*

*The paper aims to prove that demutualization has a positive effect on the revenues of the stock exchange, thus it enhances the value of the exchange.*

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### 1. Introduction

Stock exchanges were traditionally run as cooperative-mutual venues. The globalization, the development of technology, and the increase of competition among stock exchanges forced these venues to change their structure and adopt a new one-demutualization- that can be a lifeline in facing these changes to the business climate in regards to stock exchanges.

Aggarwal (2002) concluded that the traditional exchanges were lacking in the financial flexibility to compete with the new competitor exchanges as the traditional venues had never experienced competition. This new trend opened the door for outside investors to participate and inject the exchanges with the necessary source of funding (capital) to enable the exchange to expand their activities and supply the market with new products and services, therefore enhancing the value of the exchange itself.

As Hughes (2002) showed, most corporations are organized with their share capital in three main separate groups (the owners, principal decision makers, and its customers). In this organizational form, the voting right principal is one share-one vote, with a board of directors elected by the share-holders, and as result, new capital can be raised from a variety of sources. Traditional exchanges, otherwise known as mutual exchanges have a cooperative structure where its members-brokers and dealers- own or control the venue and all the voting rights granted by ownership. By definition, the demutualization process is converting mutually-non profit- owned organizations into investor-owned/for profit- corporations.

Demutualized exchanges are limited companies owned by shareholders/outside investors, where the separation of trading rights and ownership has taken place in order to diminish the agency problem. In this manner, the shareholders will not need to manage the trading operations; instead they will be managed by an elected board of directors (Aggarwal, 2002). DiNoia (1998) suggested that, in the case of a customer-owned exchange where it sells its shares to outside investors, its objective will be directed to maximizing profit rather than focusing on maximizing the members' private interests if exchange ownership remains vested in its members. In agreement with DiNoia (1998), Akhtar (2002) explained that the demutualization significance comes from changing the venue's objective from providing services for the benefit of its members/brokers into an entity whose main objective is maximizing the value of equity shares by generating profit from providing services to all participants- brokers and investors.

Mutual exchanges face many problems, but demutualization can solve these by providing new sources of capital, increasing the exchange's flexibility and efficiency, and keeping its costs under control. As stated by Scullion (2001) in order to gain from all these benefits: "Demutualization is not simply turning into a for profit entity owned by members. A truly demutualized exchange would be better placed if it were able to unlock its hidden value for all stakeholders in order to maximize its potential market capitalization and shareholder value".

The European and the American markets attracted more order and trading volume, increasing the amount and number of commissions, thus generating higher revenues and making the investors' positions more liquid. This is evidenced by the Deutsche Borse's expansion of its products and activities to include the derivatives, clearance and settlement and information technology. Added to that, the actions were taken by NASDAQ in providing QQQ and the exchange traded fund (ETF). However, it is widely believed that liquidity is the key. Overhauling the trading system and redressing the regulatory functions will not impact the investor's order flow positively until a state exists where assets can easily be converted into cash. Aggarwal (2002) confirmed that this will attract order flow, generate more trading volume, enhance and increase the trading commissions as a revenue source, and eventually improve the liquidity for the investors.

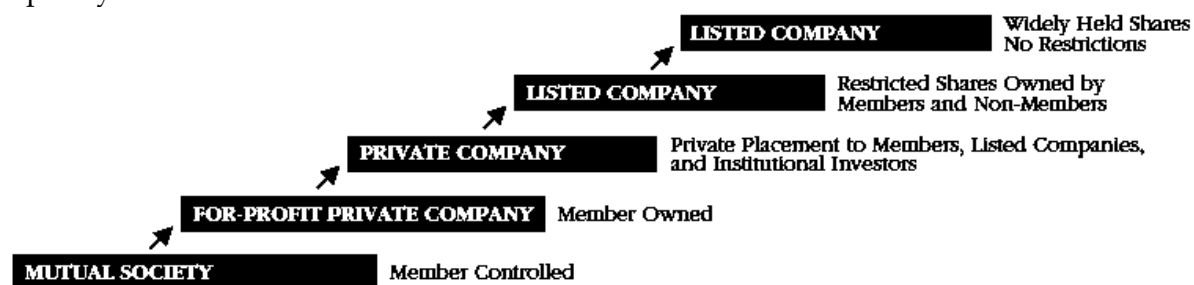


FIGURE 1 ■ THE PROCESS OF EXCHANGE DEMUTUALIZATION

As shown in figure (1), the demutualization process goes through multiple phases. The first stage starts with the conversion from the mutual-nonprofit- structure morphing into a for-profit- organization. The members thereby become the legal owners of the exchange.

During the first stage, the exchange starts by raising the capital it needs to become a private company. This is done through private placement to members, listed companies, and institutional investors. After that, the exchange has two options: to become one of two types of listed companies--either listed with restrictions (held between members and non-members) or listed and unrestricted (also available to the public).

The NASDAQ and the Toronto Stock Exchange, for example, were private companies both of which intended to become public companies through an initial public offering. It wasn't until the exchange removed all the restrictions and became a public-owned company (listed but unrestricted), that the transition was complete. The Australian Stock Exchange in 1998 became a public-owned company and its shares were listed and traded on its own exchange. The London Stock Exchange did the same after being demutualized in 2000. The WFE (2007) reported that almost 90% of the world exchanges were running as mutual companies in the mid-1990s. The World Federation of Exchanges (WFE) announced that a majority of the listed stock exchanges are reformatting themselves to become investor-owned venues. By 2000, 63% of the world stock exchanges were restructuring themselves as demutualized companies and as a result of this, in 2006, the number of stock exchanges in the old mutual form dropped to a mere 13%.

Increased globalization also increases the competition between the stock exchanges as the stock exchanges no longer hold sole power. The demutualization structure of the stock exchanges will balance the interests of all market participants and will increase the residual value of the new owners/shareholders rather than maintaining the current flow of revenue to the exchange members, Aggrwal (2002). The evolution in technology affects several business sectors, specifically the trading process among stock exchanges. Historically, stock exchanges were a physical location called a trading floor or trading room where the traders met at specific times and the brokers used "visual and verbal interactions" to match the buying and selling of orders, Steil (2002). As Lee (1998) pointed that more brokers were motivated to join the exchange in order to experience premium price discovery. On the other hand, Steil (2002) argued that this was not possible due to the high initial and annual fees applied to access the trading floor. When the time came to change the trading floor system in the United States of America, it was received with mixed emotions. An article published in the *Financial Times* (June 2002) stated that; "management recognizes the inherent logic in electronic trading as a means of keeping costs down, yet still must satisfy the wishes of its members, who have paid handsome fees to trade in the pits and who fear that any move towards electronic trading will drive the to extinction".

In Europe, all the exchanges optimized operational freedom by applying some version of continuous electronic auction, where the buying and selling orders are matched and executed in an automatic manner. This gave the European stock exchanges more operational freedom, Altaf (2009). Macey and O'Hara (2004) claimed that the advances in technology allowed the Alternative Trading System (ATS) and Electronic Communication Networks (ECNs), to rise and become the new competitors; confronting stock exchanges and enforcing the need to install expensive trading platforms. "Alternative Trading System", (ATS), is a trading system that can electronically match the potential buyers and sellers of securities, thereby eliminating the traditional broker's role in trading. ATSs include call markets, matching systems, crossing networks, and Electronic Communications Networks (ECNs). ATSs are similar to stock exchanges. The system replaces the old trading floor, allowing two subscribers to meet directly on the "ATS" which is maintained by a third party who serves a limited regulatory function by applying requirements on each subscriber. A formal definition of ECN as provided by SEC is: "any electronic system that widely disseminates to third parties orders entered into it by an exchange market maker or over-the-counter ("OTC") market maker, and permits such orders to be executed in whole or in part".

In addition, McIntyre (1999) confirmed that the rising use of ATS and ECNs is a result of the technology revolution and meets the investment community's needs for trading without the presence of brokers along with their needs for speed, cost efficiency, and accessibility which

currently cannot be offered by a traditional trading floor. Now that the demutualization process has been explained, the benefits and advantages of adopting stock exchanges of such a process can be summarized and clarified. Hughes and Zargar (2006) presented the advantages of demutualized stock exchanges as governance restructures primarily separating ownership rights and trading rights. Demutualized exchanges become more flexible as the role of non-member-stockholders increases and makes the exchange able to respond more efficiently to changes in the business climate. In order for the exchange to evolve, the roles of the exchange participants also must change. As the elected board of directors is free to create policy, make strategic plans, and supervise management, this new freedom results in unconstrained, transparent decision-making.

Akhtar (2002) stated that technology elevated to the importance of the separation of ownership from membership at the exchange. This separation leads to effective corporate governance, if and only these two conditions are met. One, the exchange is allowed to sell the stocks belonging to the exchange itself, to outside investors. The second condition is met when the decision making process shifts from being based on the members' right to being based on the new corporate structure. In a recent study Robb (2006) showed that Australia became a unique case when the government passed laws regarding the conversion of cooperatives. These laws not only accelerated the conversion process in Australia, but also expedited the demutualization process, gave access to needed capital and made the exchange a true competitor in the market.

Demutualization will provide the source of funds needed to create a technological infrastructure and provide additional products and services, otherwise unobtainable. This technology infrastructure, along with new products and services, plus access to market information, formerly only available to brokers, will attract new investors. The transparency of demutualized exchanges also increases the confidence of domestic and international investors.

## 2. A Brief Survey of Literature

Stock exchanges have many sources of income, as Lee (2002) clarified that the main sources of revenue for traditional exchanges have been listing fees, transaction fees, membership fees, clearing and settlement fees, the charge for provisions and the sale of information services such as market data, quotations, and trade data. Otchere (2006) mentioned that due to demutualization, these revenue sources are changing. Globalization gives the exchanges listed companies the opportunity to be listed not only locally, but also internationally. The marginal cost for adding new members is close to zero. The result is exchanges are forced to reduce their listing fees. Aggrawal (2002) explained another phenomenon resulting when that membership fees began to decline is that the exchanges' members-brokers can trade in multiple exchanges.

The technological improvements have changed the mode of operation for exchanges completely. Now investors have the option of trading in more than one exchange with reduced the trading costs as the national boundaries of trading time and geographical location have been eliminated along with the downsizing of the members' intermediary roles Galper (1999).

This has a negative impact as Domowitz and Steil (1999) stated: "members may resist innovations that reduce demand for their interaction services, even if such innovations would increase the value of the exchange". De Sá (2009) acknowledges the benefits of technology development toward exchanges through many authors with different overviews. The technology revolution forced the stock markets to change the rules of the exchanges. Technology development benefited traders because all barriers were removed and opened the way for the listed companies to list electronically in many venues with increased trading volume and liquidity.

Aggarwal (2002) stated that technology development eases the access to the market data needed by participants which diminishes the cost paid by participants, lowering revenues for the exchange. In contrast, Mishkin and Strahan 1999, and in line with Allen, McAndrews, and Strahan 2002 claimed technology has a negative effect by decreasing the transaction fees. So the brokers were against demutualization as technology improvements made it possible for other users to buy and sell without going through a broker, resulting in lower fees to the brokers. This put the brokers in conflict with large international banks and other members involved who united and threatened to leave the exchange if the brokers refused to obey and vote for the new trend of technology De Sá (2009).

### 3. Data and variables

We collected annual data-main operating revenues- for seven stock exchanges that were demutualized at different points of time, for the period from 1997 to 2012. A list of selected demutualized stock exchanges is provided in Appendix A, these form an eclectic mix and vary in size from the world's largest to one of the world's smallest. The data collected from the annual reports of the selected sample are available in their official websites. The paper employs U.S. dollar currency data.

#### 3.1. Dependent variable

Our dependent variable is demutualization.

#### 3.2. Independent variables

The independent variables are trading fees, listing fees, membership fees and market data.

#### Descriptive Statistics

The tables below show the change rate of each variable (listing fees, market data, trading fees and membership fees) for the selected stock exchanges before and after demutualization as follows:

Stock Exchange Name	Prior	After	Change %
New York Stock Exchange (NYSE)	7.93%	3.84%	-4.09%
Australia Stock Exchange	0	28.74%	28.74%
Oslo Stock Exchange	76.16%	17.92%	-58.25%
Bolsa Maxican	-0.26%	-7.41%	-7.15%
Johannesburg Stock Exchange (JSE)	9.78%	-5.04%	-14.82%
Kuala Lumpur Stock Exchange (KLSE)	64.07%	1.05%	-63.02%
Malta Stock Exchange	26.30%	41.70%	15.40%

Table (1) Changes rate of Listing Fees

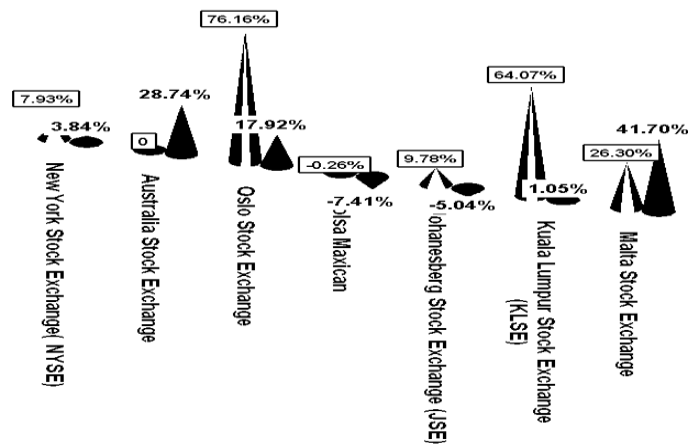


Figure2

	N	Minimum	Maximum	Mean	Std. Deviation	Valid N (listwise)
Prior	7	-26	76.16	26.2829	31.41147	7
After	7	-7.41	41.70	11.5429	18.48197	7

Table (2) Descriptive Statistics

Stock Exchange Name	Prior	After	Change %
New York Stock Exchange (NYSE)	1.76%	8.61%	6.85%
Australia Stock Exchange	0	19.80%	19.80%
Oslo Stock Exchange	-9.17%	29.18%	38.35%
Bolsa Maxican	7.67%	-13.78%	-21.45%
Johanesberg Stock Exchange (JSE)	10.67%	-5.04%	-15.71%
Kuala Lumpur Stock Exchange (KLSE)	23.76%	2.18%	-21.59%
Malta Stock Exchange	15.75%	64.24%	48.49%

Table (3) Changes rate of Market Data Fees

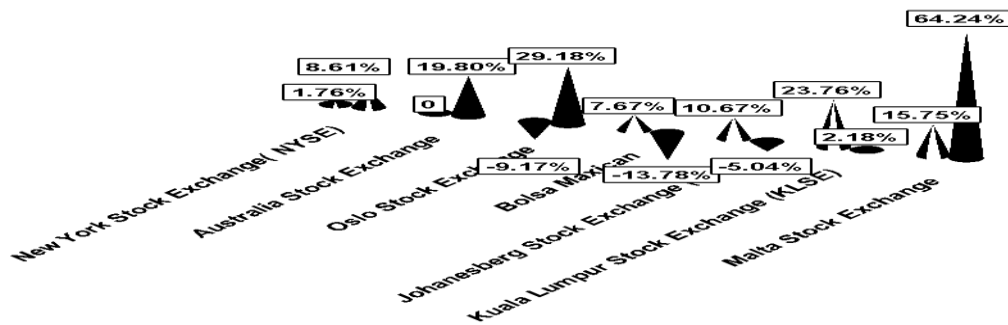


Figure3



	N	Minimum	Maximum	Mean	Std. Deviation	Valid N (listwise)
prior	7	-9.17	23.76	7.2057	10.87051	7
After	7	-13.78	64.24	15.0271	26.08882	7

Table (4) Descriptive Statistics

Stock Exchange Name	Pre	After	Change %
New York Stock Exchange (NYSE)	0.44%	33.55%	33.11%
Australia Stock Exchange	0	33.84%	33.84%
Oslo Stock Exchange	17.16%	0.53%	-16.63%
Bolsa Maxican	14.37%	-5.27%	-19.64%
Johannesburg Stock Exchange (JSE)	5.94%	4.91%	-1.03%
Kuala Lumpur Stock Exchange (KLSE)	12.76%	19.21%	6.45%
Malta Stock Exchange	27.31%	37.14%	9.83%

Table (5)

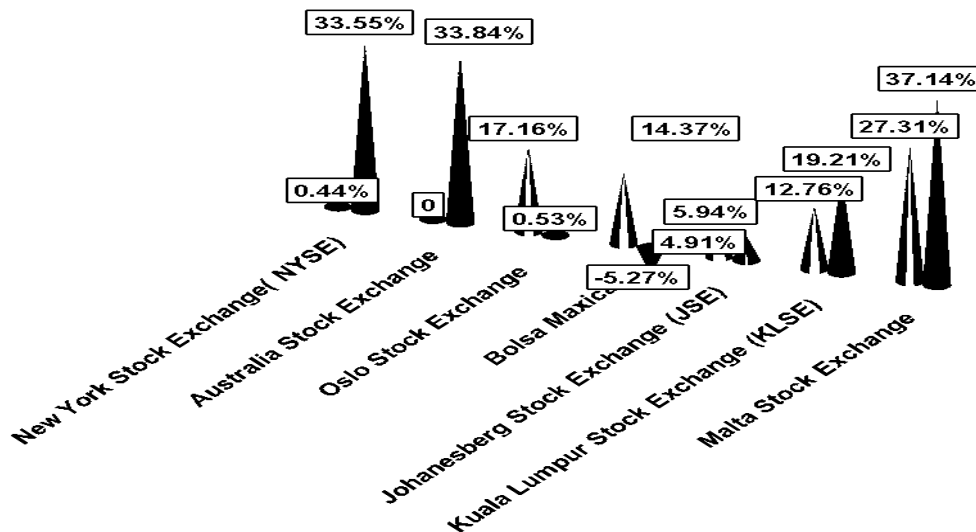


Figure 4

	N	Minimum	Maximum	Mean	Std. Deviation	Valid N (listwise)
Prior	7	.00	27.31	11.1400	9.80133	7
After	7	-5.27	37.14	17.7014	17.69147	7

Table (6) Descriptive Statistics

Stock Exchange Name	Prior	After	Change %
New York Stock Exchange (NYSE)	-61.65%	0.00%	61.65%
Australia Stock Exchange	0	-4.74%	-4.74%
Oslo Stock Exchange	20.17%	9.22%	-10.95%
Bolsa Maxican	21.87%	-18.56%	-40.43%
Johannesburg Stock Exchange (JSE)	39.94%	2.33%	-37.61%
Kuala Lumpur Stock Exchange (KLSE)	0	5.20%	5.20%
Malta Stock Exchange	0.00%	0	0.00%

Table (7) Changes rate of Membership Fees

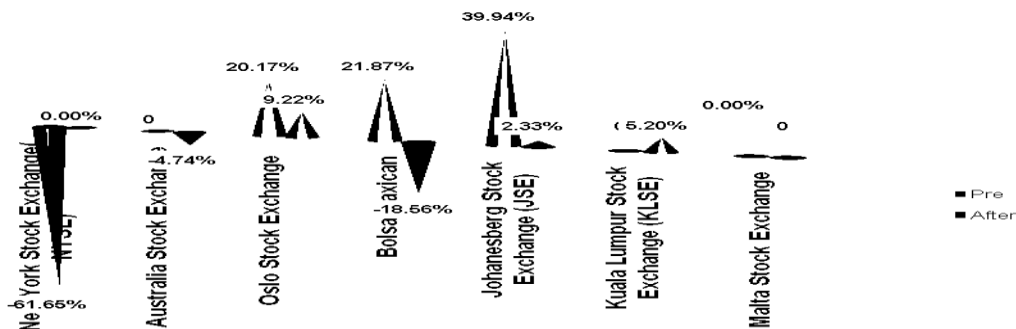


Figure 5

	N	Minimum	Maximum	Mean	Std. Deviation	Valid N (listwise)
Prior	7	-61.65	39.94	2.9043	32.20250	7
After	7	-18.56	9.22	-9357	8.92832	7

Table (8) Descriptive Statistics

Through the data analysis shown in the previous tables we found that:

- The largest positive change rate in listing fees was in Australia stock exchange and the largest negative change rate was in Kuala Lumpur stock exchange.
- The largest positive change rate in market data was in Malta stock exchange and the largest negative change rate was in Johannesburg stock exchange.
- The largest positive change rate in trading fees was in New York stock exchange and the largest negative change rate was in Mexican stock exchange.
- The largest positive change rate in membership fees was in New York stock exchange and the largest negative change rate was in Johannesburg stock exchange.

**Hypotheses Test**

In this section we test the relationship between the independent variables and dependent variable. We also estimate a panel data model with unbalanced data. The hypotheses of this analysis are as follows:

**1. Listing fees- Demutualization**

H0: There is no significant difference between the Demutualization and Listing fees.

H1: There is a significant difference between the Demutualization and Listing fees.

## 2. Market data- Demutualization

H0: There is no significant difference between the Demutualization and Market Data.

H1: There is a significant difference between the Demutualization and Market Data.

## 3. Trading fees-Demutualization

H0: There is no significant difference between the Demutualization and Trading fees.

H1: There is a significant difference between the Demutualization and Trading fees.

## 4. Membership fees-Demutualization

H0: There is no significant difference between the Demutualization and Membership fees.

H1: There is a significant difference between the Demutualization and Membership fees.

Variables	Mean Before Demutualization	Mean After Demutualization	Wilcoxon Test		P. Value
			Negative Mean Rank	Positive Mean Rank	
Listing fees	26.2829	11.5429	3.8	4.5	0.398**
Market Data	7.2057	15.0271	3.67	4.25	0.612**
Trading fees	11.14	17.7014	3.33	4.5	0.049**
Membership fees	2.9043	-0.9357	3.25	4	0.600**

Table (9)

This table reports the means of testing variables before and after demutualization for seven demutualized stock exchanges from 1997 to 2012, testing hypothesis of no significant difference (Wilcoxon test) before and after demutualization and P-value test for normality at 95% confidence level.

Reviewing the previous results, we accept the null hypotheses for the listing fees, market data fees and membership fees as the p-value is greater than 5% level of confidence (0.398 (39.8%), 0.612 (61.2%), 0.600 (60%) respectively. For the trading fees variable; we accept the alternative hypothesis, as the p-value was 0.049 (4.9%) lower than 5% level of confidence.

## Regression Equation

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.811	4.917	-	4.029	.155
	X	.355	.185	.097	1.919	.036

a. Dependent Variable: Y

Table (10)

$$Y = a + B_1X_1$$

Y= Demutualization

X<sub>1</sub>= Trading fees

B<sub>1</sub> = Coefficient (0.355)

a = Constant (19.811)

## Conclusion

We used a sample of seven demutualized stock exchanges for the period from 1997 to 2012 to show the effect of the demutualization of stock exchanges on its main sources of revenues. We found that demutualization has only a positive effect on one of the sources—trading fees. Demutualization is positively affecting the trading volume, attracting more order flows and increases the trading commissions which eventually enhance the stock exchange value and improving the investor's liquidity position. On the other hand, there is no direct effect of demutualization on the change of the other sources; listing fees, market data fees and membership fees.

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**Appendix (A)**

Stock Exchange Name	Covering Period	Demutualization Year
New York Stock Exchange(NYSE)	2003-2012	2006
Australia Stock Exchange	1997-2012	1998
Oslo Stock Exchange	1999-2012	2001
Bolsa Maxican	2005-21012	2008
Johannesburg Stock Exchange (JSE)	2001-2012	2005
Kuala Lumpur Stock Exchange (KLSE)	1999-2012	2004
Malta Stock Exchange	2002-2012	2007

Table (11)

## Value added tax and the financial performance of quoted Agribusinesses in Nigeria

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### Keywords

Value-added tax, financial performance, agribusinesses.

### Abstract

*This study aimed at investigating the impact of value-added tax on corporate financial performance of quoted companies. To achieve this purpose, we developed some hypotheses and critically reviewed existing theoretical and empirical literatures. Agribusinesses quoted in the Nigerian Stock Exchange Factbook of 2009 were considered as the population for this study. The population elements include the General Managers, Chief Accountants, Finance Managers, Chief Internal Auditors, External Auditors, and Tax Administrators of the selected companies. A total of forty (42) respondents were considered for this study. A well structured questionnaire designed in five-point Likert Scale was administered on the respondents to elicit their responses. The data generated for this study were presented in tabular form and analyzed using frequencies and simple percentages while the stated hypotheses were statistically tested with the simple regression analysis and the t-test. Our findings indicated that Value-Added Tax (VAT) impacted negatively on the financial performance of agribusinesses though the impact is of insignificant value. Based on our findings, we recommended that agribusinesses should endeavour to keep appropriate source documents of all transactions for efficient VAT operations and that the governments should ensure that proper tax incentive scheme is designed and fully implemented to promote the growth of agribusinesses, in Nigeria.*

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### 1.0 Introduction

An important landmark in tax reform in Nigeria was the adoption of the value-added tax (VAT) through the VAT Act No. 102. Its implementation actually began in January 1994. Since its introduction, 15 of the 42 sections of the Act have been amended. Replacing sales tax, VAT was originally imposed on 17 categories of goods and 24 service categories. Such items as basic foods, medical and pharmaceutical products, books, newspapers and magazines, house rent, commercial vehicles and spare parts and services rendered by community and people's banks, were VAT-free. The revenue generated from VAT was to be shared 20:80 between the federal and state governments; respectively. Currently, it is shared 15:50:35 among the federal/state/local government respectively. The state's allocation was to be earmarked as 30 per cent for the state of origin, 30 per cent for consumption/destination and 40 per cent for equity of the state.

To ensure VAT's effectiveness, certain amendments were made to the existing tax structures. These include:

- i. Reduction of the personal income tax burden through increased tax allowances and reduced tax rates;
- ii. Monetization and taxation of fringe benefits;
- iii. Deduction of R&D expenditure from the gross earnings of companies;

- iv. Extension of tax-free status to companies in rural areas and granting of incentives based on the infrastructure available in the areas;
- v. Reduction of company tax rate from 40 to 35 per cent, and subsequently to 30 percent; and
- vi. Payment of petroleum profit tax in dollars.

Although VAT is a consumption tax, a 5 percent rate is levied on suppliers (i.e., taxable individuals) who are expected to add this amount to invoices for collection from customers, and for further remittance to the VAT authorities on a monthly basis. VAT is retained at 5 percent regardless of the stage of production or distribution. This assumes the absence of cascading effects.

Although enforced by federal legislation, VAT was excluded from federal jurisdiction by the 1999 Constitution. This was unusual because at the time of introduction, the Federal Government's tax administrative machinery was used to collect VAT on behalf of the state governments, as they had the jurisdiction over the sales tax that was being replaced by VAT. It is a non-discriminatory tax with regard to locally manufactured or imported goods. The Act designates the FIRS as the responsible authority for implementing VAT. In practice, however, the Nigerian Custom Service collects VAT imports on behalf of FIRS. An important challenge to administering VAT is the nature of the Nigerian business environment. Written records are crucial for VAT; not only do invoices need to be issued, but recordkeeping is also important. Apart from the fact that proper record keeping is not generally practiced in Nigeria yet, the economy is dominated by informal activities where traders are continually on the move'. African trading activities hinge on bargaining, and a commodity is sold at different prices, depending on the haggling power of each buyer. It is against this backdrop that this study tends to examine the impact of Value-Added Tax (VAT) on the financial performance of agribusinesses in Nigeria.

To achieve this purpose, the following hypotheses were advanced

- i. Value-added tax has no significant effect on the profit after tax of agribusinesses.
- ii. Value-added tax has no significant effect on return on investment of agribusinesses.
- iii. Value-added tax has no significant effect on return on equity of agribusinesses.

## 2.0 Literature Review

Value Added Tax is theoretically a tax paid by an economic unit for the value of which one adds to goods or services during the stages of production or the distribution of those goods or services. However, in effect, VAT is a tax on the amount expended by the final consumers of goods or services. It is collected whenever goods or services are transferred for value during the production or wholesale or retail processes respectively. Whenever a trader pays for any commodity liable to VAT, he must pay the supplier a price which includes the appropriate rate of VAT on the chargeable price. In turn, the trader when selling such item to his customers includes the charge on the taxable sales price (Ofurum and Ferry, 2009).

Exemptions to this tax, at standard rate take the form of either exemption or zero rating. In respect of goods or services, which are exempt, the trade does not mean that VAT will not fall on exempt goods or services. What it means is that the purchaser does not pay tax directly on the item or purchases. The consequences of this are of two folds; viz

- (i) The supplier is not able to set off any "input tax"
- (ii) The supplier in this circumstance is the final consumer and the tax ends there.

However, to recover the tax he has paid, he will increase the selling price of his goods or services. When goods or services are zero rated, it means such goods or services are taxable but

the tax charged is nil. The zero-rated trader can sell his goods or services VAT - free because he can claim any input tax paid on his supplies. It is required of all chargeable and registered persons to keep such records of their dealings in chargeable goods or services as will enable them to compute the proper tax chargeable and to pay such tax. The records and procedures for purchases or sales accounting and invoicing must be adequate to:

- ❖ Calculate tax due or chargeable;
- ❖ Complete the quarterly returns; and
- ❖ Be verified by the relevant tax authority.

The periodic or yearly accounts may be either VAT inclusive or VAT exclusive. Adesola (1985), defines value added tax as "a consumer tax that is charged on the value which the seller or producer of goods adds to the good before selling the goods". Value added tax is tax charged on value added during the course of production of goods and services. VAT is a multi-staged level collected on sales at all stages and distribution.

It is viewed as a fiscal remedy for the developing country to the problem of fiscal disequilibrium or deficit financing. Although, VAT is essentially a money spinner for the government via consumption, conceptually, it is seen as a tax measure designed to raise revenue through consumption of vatable goods and services. It is not discriminating and can only be avoided by not consuming the vatable goods and services. The incidence of VAT is shifted by the successive stages of production and will finally rest with the final consumer.

Specifically, value added tax is targeted at the following:

- To provide incentives for export and enhance favourable balance of payment.
- To shift taxation towards consumption rather than saving.
- To maintain even tax incidences across the various stages of production (or in the production chain).
- To minimize the country's dependency on oil as the major source of revenue to government.
- To increase the revenue base of the government.
- To encourage voluntary compliance since it is based on self assessment.
- To inculcate the issuing of receipts for every purchases.
- The following are peculiar with VAT-
- It is a consumption tax that is easy to administer but difficult to evade.
- The input - output mechanism built into VAT makes it self policing.
- The VAT paid is equivalent to that paid by the final consumer as the output VAT is net off the input VAT.
- Although multistage in nature, it has a single effect.
- There are four basic methods of taxing value added. They are the direct additive method, indirect additive method, subtractive method and indirect subtractive method.

## 2.1 The Relevant Tax Authority of VAT Administration

The administration of VAT in Nigeria is shouldered by the Federal Board of Inland Revenue. This is made effective through the Federal Inland Revenue service, an operational arm of the board. It operates through a directorate located at Abuja with a network of zonal and local VAT office spread throughout the country (Nigeria). Because of the wider base, it works in collaboration with both the Nigeria custom services, and the state board of internal revenue. In effect, the state government receives 80% of the total VAT collected as 20% is used to cover the cost of administration. The FBIR are given wide powers in carrying out their duty of care and



management of VAT. The powers are largely described In relation to particular provisions as below:

First the minister of finance or secretary as it was described in the Decree is also empowered to

1. Amend the rate of VAT chargeable; and
2. Amend, vary or modify the lists set out in the schedule (1, 2 and 3) of the decree, and
3. That the board may, with the approval of the secretary make regulations for giving effect to the provisions of the decree.

Secondly, the Federal Board of Inland Revenue is also empowered to take recovery proceeding in the Value Added Tax tribunal /court to recover all outstanding VAT due.

Lastly, the Board (FBIR) is empowered to make directions, impose conditions and specify in notice the records to be kept by certain traders.

## 2.2 Registration of Vatable person

Section 8(1) of the decree provides that a taxable person shall within six months of the commencement of this decree or within six months of the commencement of business, whichever is earlier register with the board for the purpose of the tax.

Section (2) without prejudice to the provision of section 28 of this decree, a taxable person who fails or refuses to register with the board within the time specified in subsection (1) of this section shall be liable to pay as penalty of an amount of

- a) N 10,000 for the first month in which the failure occurs; and
- b) N5000 for each subsequent month in which the failure continues.

Every government ministry, statutory body and other agency of government shall register as agent of the board for the purpose of collection of tax under VAT decree. Every contractor transacting business with a government ministry, statutory body and other agency of the Federal, State or Local government shall produce evidence of registration with the board as a condition for obtaining government contract. A non-resident company that carries on business in Nigeria shall register for VAT with the Board, using the address of the person with whom it has subsisting contract, as it address for purposes of correspondence relating to tax. A non-resident shall include tax in its invoice and the person to whom the goods or services are supplied in Nigeria shall remit the tax in the currency of the transaction.

Section 9 provides that a person who is registered as specified in section 8 above shall keep such records and books of all transactions, operations, imports and other activities relating to taxable goods and services as are sufficient to determine the correct amount of tax due under this decree.

The value of vatable goods and services are determined as follows:

1. If determined by money consideration, it shall be the amount which with the addition of the tax chargeable is equal to the consideration.
2. If not determined by money, it shall be the market value of goods supplied.
3. The open market value for those involving transactions at arm's length.

## 2.3 Vatable Activities

By vatable activities we are referring to vatable goods and services. That is, those goods and services other than those exempted. It covers government, and the private sectors activities respectively. Exempted include the supply of any form of power, heat, refrigeration, the granting, assignment or surrender of a major interest, the process of manufacturing soaps, detergents, jewerries, wine, liquor soft drinks, perfumes etc all import etc.

### Non Vatable Goods

- Baby product

- Basic food items
- Agricultural chemicals
- Shelter and clothing
- Medical and pharmaceutical products
- Books, newspapers and magazines
- Commercial vehicles and their spare parts
- All exports'
- Educational materials
- Fertilizer, agricultural and veterinary medicine
- Agricultural equipment and machinery
- Plant and machinery import for use of export processing zone
- Plant, machinery and equipment purchased for utilization for oil exploration.

#### **Non Vatable Services**

- House rents
- Commercial transportation
- Service of community banks, peoples bank and mortgage institutions Medical services
- All exported services
- Plays and performance conducted by educational institutions as a means of acquiring knowledge.

#### **2.4 VAT Assessment and Collection**

Payment of value added tax is by self-assessment. Thus, all the VAT due on vatable goods and services are paid at the point of transacting on the aforementioned items. And it is 5% on the vatable goods and services. Section 11(1) states "that a taxable person shall on supplying taxable goods or services to his accredited distributor, agent, client, or consumer as the case may be, collect the tax on those goods and services at the rate specified in section 2 of this decree". And that the tax collected by a taxable person here shall be output VAT.

Section 12 (1) of the VAT decree of 1993 provides that the vatable person shall render to the board (FBIR), on or before the 30th day of the month following that in which the purchase or supply was made, a return of all taxable goods and services purchased or supplied by him during the preceding month in such manner as the board may from time to time determine. And that a person who imports taxable goods into Nigeria shall render to the board returns on all the taxable goods imported by him into Nigeria. Thus VAT on locally produced and imported vatable goods or services render return 30 days, from the month of the vatable transaction. The returns are made with form 002, which summarizes both the output and input VAT.

The best of judgement assessment (BOJ) method shall be applied by the board on any taxable person who refuses to render returns as stipulated in the Decree.

Section 13(1) states that "a taxable person shall, on rendering a return under subsection (1) of section 12 of this decree:

- a) If the output tax exceeds the input, remit the excess to the board; or
- b) If the input tax exceeds the output tax, be entitled to a refund of the excess tax from the board on production of such documents as the board may, from time to time require.

All importers of the vatable goods or services shall before clearing those goods, pay to the board the tax due on those goods. The Nigerian custom services will as part of its verification process request for VAT compliance certificate before the release of the items imported.

The net VAT remitted shall be the difference between the output VAT and the allowable input VAT. Input VAT (tax) is allowed as a deduction from output VAT, if they are payable on goods purchased or imported directly for resale and goods which form the stock in trade used for the direct production of any new product on which the output VAT is applied. Input VAT on any overhead, services and general administration of any business which otherwise can be expended through the income statement (P & L a/cs); and on any capital item and asset which is to be capitalized along with cost of the capital item and assets; shall not be allowed as deduction from output VAT.

Failure to remit VAT as specified shall attract a penalty of a sum equal to 5% per annum (plus interest at a commercial rates) of the amount of tax remittable which shall be added to the tax due. Recovery of any outstanding VAT shall be claimable through the VAT tribunal.

### **Theoretical Framework**

Under the Value-Added Tax (VAT), the value added to goods and services is ascertained conceptually by subtracting the purchase cost of a taxable good from its selling price. That is, each firm would pay a tax on the increase in the value of an economic good, which it produces. For administrative convenience, VAT is levied on the basis of the sales value of the good at a particular stage of economic activity, not directly on the value added at that stage. Specifically, VAT was designed liberally to be levied on imported goods, locally manufactured goods, hotel services and bank transactions. In Nigeria, VAT is presently charged at a flat rate of 5 percent.

It is not every business that is affected by VAT in Nigeria. The Value-Added Tax Decree No. 102 of 1993 schedule 2 as amended specified those goods and services that are exempted from VAT. These include-medical and pharmaceutical goods and services; basic food items; books and educational materials; baby products; agricultural equipment and products; veterinary; medicine; fertilizers, agricultural chemicals, exported goods and services; religious services; services by community banks (now microfinance banks), peoples banks, mortgage banks; and plays and performances conducted by educational institutions as part of learning.

However, for those businesses affected by VAT, previous studies have shown that the burden is usually shifted to the final consumer. Considering the living standard of an average Nigerian, VAT is often seen as an enemy to the individual and industrial consumers. This is why Nigerians vehemently refused to accept the increase in VAT to 10 percent which was levied about four years ago. However, for those businesses affected by VAT, previous studies have shown that the effect is unpalatable. Businesses usually pay VAT on goods and services they purchase (input VAT) and charge VAT on goods and services they supply (output VAT (Adedeji, 2004).

Inkvovic, Poterba and Weisbenner (2004) in their empirical work on "tax-motivated trading by individual investors" found that value-added tax reduces the sales volume of companies and consequently wealth maximization. In a related development, Olabisi (2004); Bradford (2000); Joulfaian and Rider (1996) in their empirical research concluded that increase in VAT rate on vatiable goods and services has a negative significant effect on corporate performance. More so, Akinmayowa (2006) conducted a study among 18 banks in Osun State on the impact of increases in value-added tax on banks' effectiveness. His study revealed that increase in VAT has a negative significant effect on bank's efficiency. In view of the above, the following hypothetical statements are advanced;

Ho<sub>1</sub>: Value-Added tax has no significant effect on the profit after tax of agribusinesses;

Ho<sub>2</sub>: Value-Added tax has no significant effect on return on investment of agribusinesses;

Ho<sub>3</sub>: Value-Added tax has no significant effect on return on equity of agribusinesses;

### 3.0 Methodology

The population of this study consists of those agribusiness quoted in the Nigerian Stock Exchange Factbook of 2009. A total of seven (7) of such companies are identified. Since taxation is a strategic issue, only the senior officers of the companies with good knowledge of taxation were considered for this study. In addition to that, external bodies with good knowledge of taxation generally and VAT in particular as it relates to the selected companies were also considered. These individuals constituted the respondents for this study and they include the General Managers, Chief Accountants, Finance Managers, Chief Internal Auditors, External Auditors, and Tax Administrators. On the whole, forty-two (42) respondents were chosen for this study.

In order to generate the necessary data for this study, both the primary and secondary methods of data collection were adopted. The primary method employed the use of a well structured questionnaire which was administered on the chosen respondents. The secondary method on the other hand entails the use of companies' records and other published materials.

The data generated for the study were analyzed using simple percentages while the stated hypotheses were statistically tested with the regression model and the t-test. The statistical package for the social sciences (SPSS) enabled us to execute these computations.

The hypotheses stated earlier in this study are tested in this section.

Ho<sub>1</sub>: Value-added tax has no significant effects on profit after tax of agribusinesses

In testing this hypothesis the profit after tax of the selected companies was regressed with percentage responses of the effect of value-added tax on profit after tax. The result obtained is presented in the table below.

Statistical variables	Values
Co-efficient of correlation (R)	0.324
Co-efficient of determination(R <sup>2</sup> )	0.105
t-statistic	-0.446
p-value	0.675
intercept	-932316.546
partial regression co-efficient	37000.804

**Table 1: Effect of Value-Added Tax on Profit after Tax**

*Source;* SPSS Version 16 Window Output

The table shows an R value of 0.324. This suggests that value-added tax has a weak effect on profit after tax. However, the intercept of the regression model is negative meaning that value-added tax has a negative effect on profit after tax. More so, the regression co-efficient (37000.804) indicates that one unit increase in value-added tax negatively affected profit after tax by 37000.804. Again the analysis shows that change in value-added tax, account for about 10.5% variation in profit after tax. The t-statistic shows an insignificant effect. Therefore, the result suggests that there is no enough statistical information to reject the null hypothesis.

Ho<sub>2</sub>: Value-added tax has no significant effect on return on investment of agribusinesses.

In testing this hypothesis the profit after tax of the selection companies was regressed with the percentage responses of the effect of value-added tax on return on investment. The result obtained is presented in the table below

Statistical variables	Values
Co-efficient of correlation (R)	0.388
Co-efficient of determination(R <sup>2</sup> )	0.150
t-statistic	-0.976

p-value	0.374
intercept	-39.164
partial regression co-efficient	0.832

**Table 2: Effect of Value-Added Tax on Return on Investment**

*Source;* SPSS Version 16 Window Output

The table shows an R value of 0.388. This suggests that value-added tax has a weak effect on return on investment. However, the intercept of the regression model is negative, meaning that value-added tax has a negative effect on return on investment. More so, the regression coefficient (0.832) indicates that one unit increase in value-added tax negatively affected return on investment by 0.832 unit. Again, the analysis shows that changes in value-added tax, account for 15% variation in return on investment. The t-statistic shows an insignificant effect. Therefore, the result suggests that there is no enough statistical information to reject the null hypothesis.

The table shows an R value of 0.388. This suggests that value-added tax has a weak effect on return on investment. However, the intercept of the regression model is negative, meaning that value-added tax has a negative effect on return on investment. More so, the regression coefficient (0.832) indicates that one unit increase in value-added tax negatively affected return on investment by 0.832 unit. Again, the analysis shows that changes in value-added tax, account for 15% variation in return on investment. The t-statistic shows an insignificant effect. Therefore, the result suggests that there is no enough statistical information to reject the null hypothesis.

Ho<sub>3</sub>: Value-added tax has no significant effect on return on equity of agribusinesses.

In testing this hypothesis, the return on equity of the selected companies was regressed with the percentage responses of the effect of value-added tax on return on equity. The result obtained is presented in the table below.

**Table 3: Effect of Value-Added Tax on Return on Equity**

Statistical variables	Values
Co-efficient of correlation (R)	0.516
Co-efficient of determination(R <sup>2</sup> )	0.266
t-statistic	1.079
p-value	0.330
intercept	439.385
partial regression co-efficient	-11.578

*Source;* SPSS Version 16 Window Output

The table shows an R value of 0.516. This suggests that value-added tax has a fair effect on return on equity. However, the regression coefficient indicates a negative effect, which implies that if value-added tax increases by one unit, return on equity will decrease by 11.578 units. More so, the analysis shows that changes in value-added tax account for about 26.6% variation in return on equity. The t-statistic shows an insignificant effect. Therefore, the result suggests that there is no enough statistical information to reject the null hypothesis.

## Conclusion and Recommendations

Value-added tax (VAT) is a tax paid by an economic unit of the value it added to goods and services during the stages of production or the distribution of those goods and services. It is actually a tax on the amount expended by the final consumers of goods and services. In other words, VAT is a consumption tax. So scholars have argued that since the economic unit shifts the burden of VAT to the consumers in the form of higher prices, it has no direct bearing with corporate financial performance (Uwein, 1999).

In this study, we observed that VAT has a negative influence on the financial performance of agribusinesses in Nigeria. An increase in VAT is responsible for about 10.5%

decrease in profit after tax, 15% decrease in return on investment, and 26.6% decrease in return on equity. A detailed analysis of these findings revealed that though the burden of VAT is borne directly by the consumer and not the business, impact of VAT reduces customers' patronage of agribusinesses. Consumers that pay higher prices for certain goods and services as a result of VAT, prefer to acquire such goods and services from other businesses where the impact of VAT is not felt, and this reduces the firm's sales volume and consequently financial performance.

Our findings do not significantly differ from Invkovic et al (2004) who reported that value-added tax reduces the sales volume of companies and consequently wealth maximization. Olabisi et al (2004) found that an increase in VAT rate has a negative significant effect on corporate performance. Akinmayowa (2006) in his empirical research among 18 banks in Osun State, Nigeria observed that an increase in VAT has a negative significant effect on bank's efficiency. Although our findings revealed that VAT negatively influenced the financial performance of agribusinesses in Nigeria, the influence is rather weak and insignificant. A possible reason for such could be due to the fact that VAT operations require that invoices and receipts of purchases and sales should acknowledge the transactions and appropriate records be kept. But these are not common practices with agribusinesses in Nigeria. Based on the above, it is recommended that agribusinesses should endeavour to keep appropriate source documents of all transactions for efficient operations of value-added tax (VAT). More so, the governments should ensure that proper tax incentive scheme is designed and fully implemented to promote the growth of agribusinesses.

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# The relationship between the understanding of philosophy of sufficiency economy and the living standard: the case study of sufficiency economy community in lower northern region of Thailand

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## Key Words

Philosophy of Sufficiency Economy, Logit Model

## Abstract

*The purpose of this research paper is to find the relationship between the knowledge of "Sufficiency Economy Principles" and the quality of life of the households. It is postulated that, the higher the level of the knowledge of the principles that the household has acquired, the better the quality of life of the household as measured by family's income. A number of survey questionnaires have been sent out to families in rural areas in Northern part of Thailand. The sample families are from two types of village: one is under a pilot project called "sufficiency economy village", the other is not. The sampled data have been used to estimate the parameters of the logit model. The results indicate that, the level of education, and the knowledge of the principles have significant influence on family's income. The location of the family (i.e., whether or not it is in the Philosophy of Sufficiency Economy prototype village), however, has no significant relation with the family's income.*

**Author's Note:** The authors would like to thank to the Research Institute of Rangsit University for providing financial support for this research project.

## 1. Introduction

### 1.1 The Anatomy of Financial Crisis

The Asian Financial Crisis 1997 had brought down Thailand into severe recession never experienced in its economic history. The cause of financial crisis in Thailand was attributable to free international capital flows which enable Thai investors to invest more than domestic saving and allow Thai consumers to consume more than domestic output. This over-spending behavior by Thai investors and consumers was financed mainly by external borrowing in the form of capital inflows.

The over-spending activities financed by foreign borrowing did not last for long, however. Once the level of borrowing reached the threshold where the return from investment projects was not large enough to service the loan repayment coming due, the bad loans started to spread all over the balance sheets of all financial institutions. These bad loans had eaten up the capital of financial institutions to the point where these institutions must stop banking operations due to capital inadequacy.

The final episode of financial crisis saw the whole financial system collapsed completely which sent the business and production sectors grinding to a halt. Severe recession followed when large portion of labour force was laid off and became unemployed. The economic crisis spread out to some other Asian countries like South Korea, Indonesia and the Philippines.

There is a general consensus among economists about what causes financial crisis. They agree that the main culprit is the free international capital flows which allowed people in the

capital- recipient countries to borrow more than domestic saving. Consequently, people in these countries will consume more than the output they produce. This over-consumption will be reflected in the deficit in current account. Such is the situation called “Double or Triple Deficits”, when the balances of all sectors (private, government, and foreign trade) are in the red.

### **1.2 Can we blame it on economic theory?**

After the world has experienced so many financial crises, many people started to cast some doubts on the soundness of modern economic theory that we teach students in the vast majority of universities around the world today. The simple question is raised: If the assumptions that the producer maximizes profit and the consumer maximizes utility are correct, why do they behave in a manner like over- investment and over- consumption, which lead them to end up in financial crisis, or bankruptcy in plain words?

Some proponents of modern economic theory argue that the economic theory is always sound. The behavior of economic agents deviate from the assumption in economic theory is simply the result of government intervention in private sector. In particular, the economic agents are willing to take too much risk by performing over- investment and over- consumption because the government provides them with some kinds of insurance like income guarantee, health care, bail-out plan for failed banks, and fixed exchange rate. These insurance provided by the government will distort the behavior of the people to become risk takers, who will be complacent, willing to take high risk and not afraid of failure. This situation is well known in economic theory as a “Moral Hazard of Government Insurance”.

### **1.3 Philosophy of Sufficiency Economy (PSE)**

The 1997 Financial Crisis was a painful experience for Thai people operating in all sectors and sections of society. It took almost a decade to recover from that crisis. During that prolonged recovering process, policy makers tried to revise implement new economic measures to ensure that Thai economy will not slip into crisis again in the future.

Among these new economic measures aiming to rebuild Thai economy, a certain economic development program called “Sufficiency Economy”, which is under His Majesty King Bhumibhol’s initiative, came to a main focus. As a matter of fact, the Philosophy of Sufficiency Economy (PSE) has been recommended by His Majesty the King to Thai people about 30 years ago, long before the occurrence of 1997 Financial Crisis. The essence of the PSE is the focus on sustainable development through the practice of reasonableness, moderation and self-immunity by people of all walks of life. But not until 1997 Financial Crisis, the PSE has not been followed seriously by Thai people. It was only after the Crisis, that Thai people realized the significance of His Majesty’s teaching, the PSE has been brought into serious attention by all sectors. Since that crisis, Thai government started to use the PSE as a guideline for economic development program for the country. Nowadays, there are many PSE prototype villages located all over the country. It is hoped by policy makers that once the practice of PSE has been carried out by the majority of Thai people, Thailand will be able to move forward with high and sustainable economic growth, with minimal risk of failure.

The assessment of success of the prototype PSE villages is the main focus of this research paper. The Sufficiency Economy Principles is mixture of economic development practice and the philosophy of living. In a nutshell, the PSE can be summarized in simple framework known as “Three Principles and Two Conditions” to be explained below.



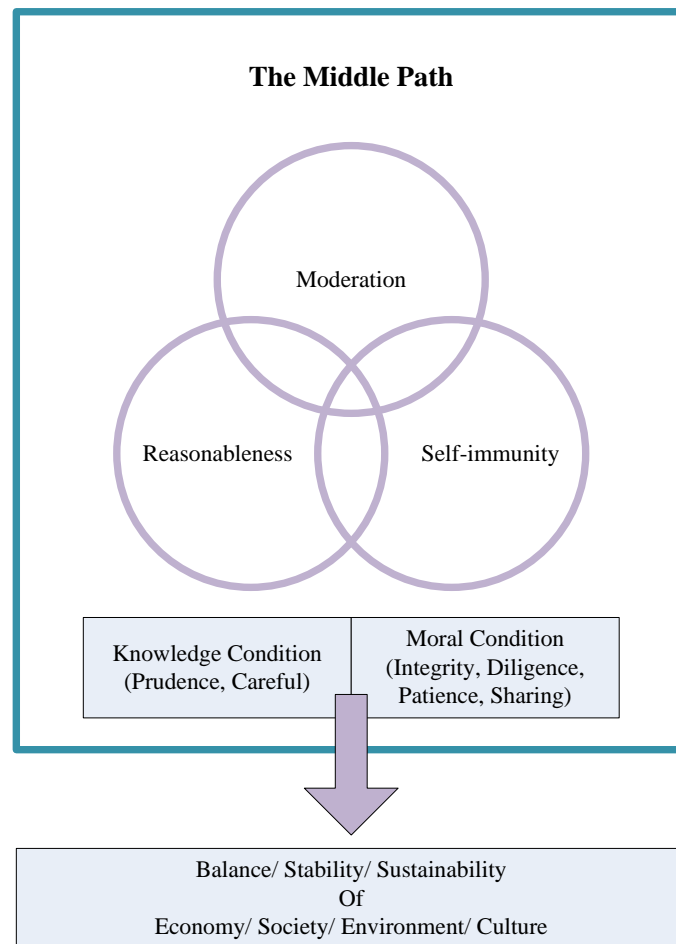


Fig. 1: The Philosophy of Sufficiency Economy Concept

“Moderate” means to be simple, not to take things to the extreme. The practice of moderation will help individuals to make a stable growth in life. Having simplicity as a norm, the individual will tend to have a happy life, with no envy in mind, and hence will always create good things for society.

“Reasonable” means to be careful in doing thing. Reasonable individual will gather all relevant information for making any decision. He will calculate the results in advance to assess the risk and return and the impact on other people and community as a whole prior to taking any action. When individuals use reasonableness as a guiding wisdom, it is no doubt that the society as a whole will benefit in terms of peace and prosperity.

“Self- immune” means to be able to cope with risk and adversary without having to depend much on the help from other people or the government. To be self- immune, the individuals must be prudent and well-aware of risks involved. He may employ the risk-protection tools in the forms of savings, buying insurances, joining the club or association, and creating good connection among people in community.

Knowledge is one of the two pillars that will help support individual in the practice of the three rings. With sufficient knowledge, he tends to be reasonable and self- immune in making a daily living and a careful plan for a future.

Morality is another pillar that can guarantee that individual will behave in a reasonable manner. A person with morality will be a good citizen, cooperative, and always willing to help

others. Furthermore, with good conscience, he can live a simple life and not taking things to the extreme.

It can be envisaged that, individual practicing the simple framework of PSE as illustrated will surely has a good life, with simple living and stable growth. When individuals in the society behave in this manner, the economy as a whole will prosper and is more likely to expand along sustainable path. It is worth noting that, sufficiency in the PSE does not have the same meaning as self-sufficient in Robinson Crusoe story. While Crusoe's self-sufficient means everything is scarce on a lonely island, the sufficiency in PSE means that people should have plenty of everything once they follow the practice the PSE seriously. The sufficiency economy supports the production and trade activities as conducted in modern capitalist system. What the PSE recommends is that, individuals must be reasonable, moderate, and self-immune, so that they can avoid economic crisis as frequently occurred in the present time.

#### **1.4 The Philosophy of Sufficiency Economy and Modern Economic Theory**

It is well- established in modern capitalist economic theory that the economic system will perform at its best when no market failure occurs. The market failure conditions include, among others, the monopoly, public goods, externalities, imperfect or incomplete information, and deviations of the system from its equilibrium due to external shocks (generally called business cycles or economic crisis). These market failures, when they occur, will cause the economic system to perform at lower than its optimal level, which will result in the welfare loss to the society as a whole.

The existence of the market failures, which is usually unavoidable due to market imperfection, calls for government to intervene in order to restore the efficient performance of economic system. However, more often than not, especially in less developed countries, the government has no intention to correct the market failures. This is due to the fact that, in most less-developed countries, the government is the representative of the interest groups. These interest groups are clearly those who benefit from market failure conditions such as monopoly, externalities like the emission of pollution to the earth atmosphere, the destruction of environment in any form, just to name a few.

The above claim can be supported by the evidence that, in less developed countries, the market failures still keep flourishing. Even though there exist the laws to regulate the market failures, but the enforcement seems to be so weak. With the understanding of the PSE among general people, the market failure conditions can be mitigated without useless intervention from the government. For examples, when people practice the principle of moderation, they will have no intention to monopolize the use of resource or information, to produce externalities like pollution, or to destroy environments for their own monetary gain. Furthermore, when people learn to practice the principle of self-immunity, they tend to be more careful in doing things. In other words, they will become more risk averse in modern economic terminology. Consequently, they will focus more on saving and less on consumption and borrowing. Obviously, self- immunity principle, the economic crisis can be avoided.

It can be seen that, the PSE is not in contradiction to the modern economic thinking. Rather, the PSE can help reduce the degree of market failures, which will in turn improve the performance of the capitalist system.

## **2. Literature Review**

Mongsawad (2010) proposes that the philosophy of sufficiency economy conveys new theory in addressing current development challenges, which are issues of institutions, human capital, environmental sustainability and the role of government. The philosophy of sufficiency

economy, as a new paradigm of development, aims at improving human well-being as a development goal.

Bunyasrie (2010) uses the concept of sufficiency economy to analyze the causes of the Thai financial crisis in 1997. She pointed out the weaknesses of Thai economy and suggested the ways to prevent such crisis from happening again. She also recommended that the sufficiency economy and creative economy could be harmonically integrated to achieve a sustainable development.

Stückelberger (2010) claims that the future ethical market economy will be a sufficiency economy. It will provide “enough for everybody’s need, but not for everybody’s greed” (Mahatma Gandhi). A new vision of what human beings are will grow: human beings are not only grasping for maximum of material wealth and for maximum profit on the back of the others. They also look for community, solidarity and a meaningful life. Such anthropology will balance competition with community. It will modify economic and political theories. It will limit individual and institutionalized greed and lead to a new economic paradigm of fair and sustainable markets.

Calkins (2009) has constructed sufficiency economy matrices for use by local development planners. He applies constrained optimization, risk programming, and sufficiency economy philosophy to a case study of a sub-district in Northern Thailand. A seven-step process takes local decision-makers and planners from their current sub-optimal, unprotected situation to an optimal, “immunized” 5-year plan. Shadow price analysis, sufficiency economy indicators and parametric programming are also integrated into the 7-step procedure.

In this paper, the authors attempt to find the relationship between the understanding of the Philosophy of Sufficiency Economy concept (PSE) and the quality of life of people. At this stage, we use the family’s incomes as a proxy for the quality of life. The data on the level of understanding of PSE are obtained from the survey questionnaires sent out to people living in rural northern part of Thailand. The logit model is employed to find such relationship.

### 3. Methodology

This research work is aimed at investigating the relationship between the understanding of Sufficiency Economy Principles and the well-being of the households. It is postulated that those who have good knowledge and understanding of PSE should have better standard of living than those who lack the knowledge of PSE.

We collected the data from questionnaire issued to and responded by households from two types of village, one is under the government-run PSE program, and the other is not. Various questions regarding the principles of sufficiency economy were asked on the questionnaire and the total score is given to each household participating in the research.

The research uses family’s incomes ( $Y$ ) as a proxy of the well-being of a household. We let  $Y=1$  (representing good living standard) if the family’s incomes is equal to or greater than 10,000 baht per month, and  $Y = 0$  (poor living standard) if the family’s incomes is less than 10,000 baht per month. The study uses 10,000 baht per month as a threshold since this level is approximately an average income per capita of Thai people at the present time. The study employs a logistic regression to analyze the data. The logistic regression equation is as follow.

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 KnowSuff + \beta_2 Edu + \beta_3 FamNum + \beta_4 MStatus + \beta_5 Gender + \beta_6 SuffV + u_i \quad (1)$$

where

$\ln\left(\frac{p_i}{1-p_i}\right)$  = The natural log of the ratio of the probability that the event will occur (in our case

the event is the household will have a good living standard, i.e., a family's incomes equal to or more than 10,000 baht per month) to the probability that the event will not occur (generally called the "Odds Ratio"). In the regression, the data on family's incomes will be set to 1 if it is equal of greater than 10,000. It is set to 0 when it is less than 10,000.

KnowSuff = The household's score of the test on the knowledge of PSE obtained from the household's response in the questionnaire

Edu = The level of education of the head of the family  
 1 (lower than/ not complete high school level)  
 2 (complete high school/lower-level vocational school)  
 3 (higher-level vocational school/certificate)  
 4 (bachelor degree)  
 5 (higher than bachelor degree)

FamNum = The number of the members in the family

MStatus = The marital status of the respondent  
 1 (single or living separately with spouse)  
 0 (married or living together with spouse)

Gender = The gender of the respondent to the questionnaire  
 1 (male)  
 0 (female)

SuffV = The type of village that the sample family is located  
 1 (in the PSE prototype village)  
 0 (not in PSE prototype village)

$u_i$  = The disturbance term of the regression

#### 4. Regression Results

372 observations were gathered from questionnaires and the logit regression was run on EVIEWS software. The regression results are as follow:

$$\ln\left(\frac{p_i}{1-p_i}\right) = -1.9012 + 0.0603 \text{ KnowSuff} + 0.4477 \text{ Edu} + 0.0729 \text{ FamNum} \\
\begin{matrix} (-4.144620) & (1.929404) & (3.609300) & (0.941423) \\ -0.4189 \text{ MStatus} + & 0.5441 \text{ Gender} - & 0.3324 \text{ SUFFVILL} \\ (-1.398479) & (2.288483) & (-1.438022) \end{matrix}$$

The figures in parentheses are z-statistics being used for testing the significance of parameter estimates. It can be seen that the parameter estimates of level of education and gender are significant at 5% level, while that of knowledge of PSE is significant at 10% level. This means that these three variables are significant in explaining the well-being (family's incomes) of the households. Other variables such as marital status, and located in PSE prototype village are not significant in explaining the level of family's incomes.

The parameter estimate obtained from logit regression can be interpreted as a marginal effect of a unit change of an explanatory variable on a change of a probability that event under consideration will occur. In this research, it is the probability that the family's incomes will be equal to 10,000 baht or more per month (i.e., the probability that  $Y = 1$ ). The derivation of the marginal effect can be explained below. The logit regression equation can also be expressed as

$P_i = E(Y = 1 \mid X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}}$  or  $P_i = F(Z_i) = \frac{1}{1 + e^{-Z_i}}$  where  $Z_i = \beta_1 + \beta_2 X_i$ . The marginal

effect of Z on the probability P is  $f(Z) = \frac{dP}{dZ} = \frac{e^{-Z}}{(1 + e^{-Z})^2}$ . Then the marginal effect of a particular

$X_i$  can be written as  $\frac{dP}{dX_i} = \frac{dP}{dZ} \frac{dZ}{dX_i} = f(Z)\beta_i$ . Here, the value of Z is the mean value of the estimated regression equation.

Hence, from the regression results obtained, we can construct the table indicating the marginal effect of each explanatory variable on the probability that the event will occur as follow:

Table 1: A summary of the marginal effect of a one unit change of each explanatory variable on the probability that the family's incomes will be 10,000 baht or more per month ( $Y = 1$ ).

Variable	Mean	$\beta$	Mean $\times$ $\beta$	$f(Z) = \frac{dP}{dZ} = \frac{e^{-Z}}{(1 + e^{-Z})^2}$	$f(Z)\beta_i$
KnowSuff	9.1283	0.0603	0.5504	0.2339	0.0141
Edu	1.3548	0.4477	0.6065	0.2339	0.1047
FamNum	3.7513	0.0729	0.2735	0.2339	0.0171
MStatus	0.2086	-0.4189	-0.0874	0.2339	-0.0980
Gender	0.3235	0.5441	0.1760	0.2339	0.1273
SuffV	0.4118	-0.3324	-0.1369	0.2339	-0.0777
Constant	1.0000	-1.9012	-1.9012	0.2339	-0.4447
Total			-0.5191 = Z		

From Table 1, the results reveal that the marginal effect of knowledge on PSE equals to 0.0141, meaning that if the test score of PSE (randomly picked) increases by one point, then the probability that the family's incomes is equal or greater than 10,000 baht per month increases by 1.41 percent as a consequence.

The marginal effect of education equals 0.1047, meaning that if the education of the head of the family (randomly picked) increases by one level, then the probability that the family's incomes equal or greater than 10,000 baht per month increases by 10.47 percent. Also, the marginal effect of family members equals 0.0171. This implies that if the members of the family (randomly picked) increases by one person, then the probability that the family's incomes equal or greater than 10,000 baht per month increases by 1.71 percent. As well as the marginal effect of gender is 0.1273. Therefore, if the gender of the respondent (randomly picked) is male, then the probability that the family's incomes is equal or greater than 10,000 baht per month increases by 12.73 percent.

Noticeably, the marginal effects of marital status and staying in the PSE prototype village are negative. The marginal effect of marital status is -0.098. Thus, the marital status is single or married but living separately from spouse, then the probability that the family's incomes will be equal or greater than 10,000 baht per month decreases by 9.8 percent. Lastly, the marginal effect of staying in the PSE prototype village equals -0.0777, meaning that if the family (randomly picked) is located in a PSE pilot project, then the probability that the family's incomes is equal or greater than 10,000 baht per month decreases by 7.77 percent as a consequence.

There are some interesting points worth noting from our marginal effect analysis above. Firstly, most of explanatory variables show the sign of effect as expected. However, we expect the effect of staying in the PSE prototype village on the probability of family's incomes to be positive, the estimated result shows the opposite. This contradiction may be attributable to the

fact that the PSE pilot project is targeted at the very low-income village, in order to help poor people to begin with. Consequently, the data obtained from our survey reflects this point by showing that the average family's incomes of people in PSE pilot village is lower than that of people in non-PSE village. Secondly, it can be seen that the factors that show strong impact on family's incomes are education level, marital status and gender. For education level, the result obtained in this paper seems to be in line with modern growth theory which proposes that the economic growth depends in large part on the quality of human capital, in which the education is a significant determinant. As for marital status, it is quite obvious from the fact of life that, a household with two people living together should make a better living than a household with single person. For gender, it is quite natural in developing countries that when the head of the family is male, the income will be higher as compared with that when female is the head of the family. Lastly, the knowledge of PSE, which is the focus of this research paper, yields the positive effect on family as expected. Its impact may not seem large, but statistically significant. However, as we stressed earlier in the paper, that the aim of PSE is to guide people to find way to have better quality of life, not just to earn more income. Therefore, if we can construct a quality of life index comprising various dimensions such as income, health, social, and environment, then we may find something more interesting than using income alone as we do in this paper. But let us leave that for a future research.

## 5. Conclusions

This research focuses on the finding of the relationship between the understanding of PSE and the quality of life. In this research, we use family's incomes as a measure of quality of life of a household. A number of questionnaires have been sent out to people in rural areas in Northern part of Thailand. These questionnaires include, among others, a set of questions to test how much each household understand the PSE.

This study used the logit model to run regression with the data collected from the questionnaires. The dependent variable is the family's incomes, and the explanatory variables are the level of education, the understanding of PSE or knowledge of PSE, number of members of the family, marital status, gender, and whether or not the family lives in the PSE pilot project village. The regression results show that, level of education, the understanding of PSE, and gender are statistically significant, while the rest of the explanatory variables are not.

In conclusion, the understanding of PSE, which is the focus of this research, is found to be one of the key factors having influence on the quality of life of the household as measured by the level of family's incomes.

## 6. Research Limitation and Direction for Further Research

Since this research uses only family's incomes as a measure of the quality of life of the household, it will be more interesting for future research to bring into consideration other measures in various dimensions, such as social, environment, health, security, and etc. To do such that, it is necessary that the composite index for measuring quality of life must be constructed, with appropriate weight given to each dimension. This will involve a collection of massive data and the construction of index of well-being will also be a challenging task indeed.

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# The new determinant creation theory: a way to attract new foreign direct investment flows

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## Keywords

Foreign direct investment, determinants, public policy, theories.

## Abstract

*According to the literature related to the movement of foreign direct investment (FDI) worldwide, there are two main causes for these flows. The first one is related to the decision taken by companies to invest in certain markets according to their own international strategy and, the second corresponds to the government's policy designed to attract capital through the use of various factors such as infrastructure, skilled labour, cheap labour, industrial policy, natural resources, gross domestic product, the legal system, geographic location, cancellation fees, among others. Thus, governments attract capitals to certain types of industries using the attractiveness of their determinants.*

*Considering the above approach, if a government wants to attract capital to an industrial sector different than to which traditionally it tries to attract, should it create new determinants to attract new investment flows? This paper proposes a new theory to attract new investment flows based on the creation of new determinants. To develop this new determinant creation theory, the case of Mexico is analyzed.*

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## 1. Introduction

In recent years, FDI has grown faster than trade flows and global production for various reasons such as political and economic changes in many developing countries, which are characterized by the change to democratic political systems as well as changes toward economic and legal systems oriented in the direction of trade liberalization in which Mexico played an important role since 1986 when signed as a GATT member. Many developing countries have made economic and structural arrangements in order to obtain some benefits and attract FDI. Because of such liberalization and changes, the FDI increased in developing countries in the 1990's (Erdal and Tatoglu, 2002).

Since 1993, the FDI became an important source of private capitals outflows and inflows for Mexico as well as for many countries around the world. From that year, Mexico's public policy oriented to FDI flows uptake changed since a new foreign investment law was created. The new law expressed the need to encourage domestic and foreign productive investment within the country. Later on, in 2007 the PROMEXICO federal office was open for the purpose of attracting investment flows through different strategies like working together with the 32 states to make them attractive to foreign capitals.

The attractiveness of a state or a city depends on the number and kind of determinants they possess. Based on the state development plans for the 32 Mexico's states, the most relevant determinants used to obtain FDI are infrastructure, skilled labour, low labour cost, security, tax-break, natural resources, gross domestic product, legal system, geographical location and industrial policy. Related to industrial policy, Deichmann *et al.* (2003) found that some factors determining the spatial decisions of multinational firms in a Middle East country depend on policy implications. Considering the above, the government agenda should focus on making the country more attractive for FDI, especially in times of crisis when traditional determinants are



put to the test and inspire proposals for new opportunities. Popovici (2012) notes that the idea of entering a new era of determinants of FDI is not new as there are several studies that highlight the key factors for attracting FDI. This emphasizes that the classical theories of FDI probably should be changed and others should be based on the emergence of new local capacities.

This research is divided as follows. In second part, a literature review is offered. Several papers were analyzed to describe the key factors for attracting FDI based on classical theories in order to compare them with the determinants used by Mexican government during 2000 to 2012. Section three includes the data and variables used to demonstrate the model proposed in section five. Descriptive statistics are presented in section four and finally, conclusions are discussed in section six.

## 2. Literature review

Most of the literature related to the attraction of FDI by countries is based on different theories such as localization economies and their determinants or related to trade and resource endowments. In that sense, the eclectic paradigm of Dunning (1988) argues that the path FDI takes is partly due to the specific advantages which one country has, based upon its regional geographic location and / or location in the world. These advantages arise from using resource endowments and / or assets held abroad by some countries in the world which are attractive to a company by combining them with its own resources.

That combination suggests that if a foreign company wants to use the resources of a country, it should establish a subsidiary by initiating a flow of FDI and then establish a start-up of an operating facility (Hill, 2008).

Likewise, the theory of international production suggests that the decision of a company to start manufacturing operations in other countries depends on certain attractions that the country of origin of the company has compared to the resources and benefits that it will obtain in locating a manufacturing subsidiary abroad (Morgan and Katsikeas, 1997). The theory of trade and resource endowment explains that FDI is directed toward countries with low wages and abundant natural resources that provide inherent differences of opportunity and initial favorable conditions for businesses.

There is a consensus as to the characteristics required for a host country to attract FDI which is that it depends on the motivations that foreign investors have in relation to their investment projects. According to Dunning (1983), the first reason is related to the market, whose main purpose is to serve local and regional markets from the FDI host country if the market grows and generate some return for the investor, the second relates to the investment made by a company in acquiring resources that are not available in the country of origin such as natural resources and low-cost inputs including labor. The latter corresponds to the level of efficiency achieved through the dispersion of value chain activities considering that the geographical proximity to the country of origin will minimize transportation costs. All this suggests that the direction, in which FDI is aimed, is highly related to the comparative advantages (Kinoshita, 2003) of a given country. Then, one country that has, among other determinants, access to markets as well as cheap labour and abundant natural resources will attract large inflows of FDI.

Berkoz (2009) argues that countries have traditional factors and environmental variables that are attractive to foreign companies. The traditional factors are market potential, labour costs, economic growth and government policies. The environmental variables correspond to political, economic, legal and infrastructural factors.

Kinoshita (2003) in turn, maintains that the most important determinants a country has to attract FDI are government institutions, natural resources and economies of agglomeration. Government institutions are one factor contributing to decisions by investors as to whether to invest or not in a particular country because these institutions directly affect the operating conditions of enterprises. The investment cost for companies is not only economic, but they also have to fight against entrenched practices in countries such as bribery and time lost in engaging in diverse and various negotiations resulting from the arrival of the company to a new market. Therefore, for the operating conditions of a company to appear reliable to the investor, there are two institutional variables to be considered: The legal system and the quality of the bureaucracy. As for the legal system, both its impartiality as well as popular perception of it are reliable determinants of the reliability of legal institutions in the country. Likewise, the variable related to the quality of the bureaucracy describes a non-political and professional bureaucracy which in turn facilitates the procedures for staff to be hired. With respect to agglomeration economies, investors seek those markets where there are benefits derived from the concentration of economic units which results in positive externalities (benefits and technological spill, use of skilled labour and concentrated in specific locations and links forward and backward with related industries) but also by investments made by other investors which can be seen as a positive sign of favorable investment conditions reducing uncertainty. As for the natural resources, Rasiah (2000) argues that developing economies with a resource-rich endowment obtains FDI.

Other studies describing the FDI determinants indicate that the infrastructure, good governance, taxes (Rasiah, 2000) and the labor market are conditions that governments must maintain (Bellak, et. al., 2010) but Lim (1983) found a negative relationship between investment incentives and FDI in 27 developing countries.

Groh and Wich (2009) describe the attractions to attract FDI in a country as labour costs, quality and the provision of quality infrastructure and legal systems. On the other hand, some authors consider that the provision of infrastructure should be a precondition for companies to establish subsidiaries in foreign markets as are a major emphasis on the provision of transport infrastructure as well as information and communication technologies (Botric and Skuflic, 2006, Goodspeed, et. al., 2009).

Studies by Wei *et al.* (1999), Mariotti and Piscitello (1995), Broadman and Sun (1997) and He (2002) conclude that there is a positive relationship between infrastructure and FDI because the better the infrastructure is in a location the higher its desirability. Rasiah (2000), states out that FDI in developing countries is concentrated in economies endowed with good infrastructure. In recent research conducted by Botello and Davila (2013), they concluded that public policy used in some states of Mexico to attract FDI, is based on the attractiveness of some determinants such as skilled labour, cheap labour and infrastructure.

As opposed to what Botello and Davila (2013) concluded, Ondrich and Wasylenko (1993) and Rasiah (2000) found that there is no evidence that wages affect the location of new foreign plants, especially cheap labour but that it's not the case for skilled labour. Flexible production forms have given rise to greater dispersal of organizational power as well as process innovation; local accumulation at peripheral sites has stimulated economic progress, albeit only in locations generating the requisite skills (Rasiah, 2000), suggesting that specialized FDI requires skilled labor. In the same way, Mendoza (2011) found that manufacturing companies established with foreign economic resources in Mexico demands skilled labor.

According to the research studies mentioned above, there are similarities in the description of the traditional determinants, which explain the attractiveness of a country with respect to foreign capital which suggests that the design of public policy in some countries and Mexico in particular, in relation to attracting financial resources from abroad, is very similar. In the case of Mexico, the statistics of attracting FDI for the period covering 2000 to 2012 show that relationship. In fact, the 32 Mexico's states development plans for 2000 to 2012 showed that the most common used determinants for attracting FDI are infrastructure, skilled labour, cheap labour, industrial policy, natural resources, gross domestic product, the legal system, geographic location, tax break and security. Berkosz (2009) found almost the same determinants for the case of Turkey and suggests that a location analysis needs to be done in order to develop specific growth strategies to be applied by policy-makers in their plans to attract FDI to certain locations.

Figueroa (2012) assumes that tax facilities, proximity to markets, and cheap labour are insufficient factors to guarantee the cycle of capital, since what stands out is the outgoing transfer of the innovation activity itself, which suggests that the attraction of new FDI flows requires the creation of new determinants or the renewal of the most used. The advance of global knowledge has become itself as an attractive determinant to catch the attention of investors. In recent years, many countries around the world are worried about how they are going to attract capitals. Should they create new determinants or renewal the ones that are always used? As for the case of Mexico, an FDI behavior from 2000 to 2012 is described in section 5.

### **3. Objectives, Variables, Hypotheses and Data**

#### **3.1. Objectives**

The objective of this research is to demonstrate that the improvement of the determinants used by the 32 states of Mexico from 2000 to 2012 to attract foreign direct investment (FDI) contributed to increase inflows.

#### **3.2 Variables**

The dependent variable that we use in this research is:

**3.2.1. fdi** (amount of foreign direct investment). Foreign Direct Investment (FDI) has been selected as a dependent variable relative to the amount of Mexico's foreign direct investment inflows from 2000 to 2012.

The independent variables in their different modalities that will be considered for the theoretical models are:

**3.2.2 ifra** (infrastructure). This variable explains if infrastructure was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.

**3.2.3 qualab** (qualified labor). This variable explains if skilled labor was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.

**3.2.4 wage** (minimum wage). This variable explains if low cost labour was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.

**3.2.5 sec** (security). This variable explains if security was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.

**3.2.6 Taxes** (exemption from tax payment). This variable explains if exemption from tax payment was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.

- 3.2.7 natures (natural resources). This variable explains if natural resources were used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.
- 3.2.8 gnp (gross national product). This variable explains if gross national product was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.
- 3.2.9 legal (legal framework). This variable explains if a legal framework was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.
- 3.2.10 geoloc (geographical location). This variable explains if geographical location was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.
- 3.2.11 indpol (industrial policy). This variable explains if a foreign direct investment industrial policy was used as a determinant to attract foreign direct investment from 2000 to 2012 by the 32 states of Mexico.
- 3.2.12 impde (improvement of determinants). This variable was selected as a dependent variable to use it in the *probit* model in order to explain the probability of improvement of the determinants used to attract foreign direct investment contributed to increase inflows from 2000 to 2012 by the 32 states of Mexico.

### 3.3. Hypotheses

- H<sub>1</sub>: The attraction of foreign direct investment depends on infrastructure development within Mexico from 2000 to 2012
- H<sub>2</sub>: The attraction of foreign direct investment depends on skilled labour within Mexico from 2000 to 2012
- H<sub>3</sub>: The attraction of foreign direct investment depends on cheap labour within Mexico from 2000 to 2012
- H<sub>4</sub>: The attraction of foreign direct investment depends on security within Mexico from 2000 to 2012
- H<sub>5</sub>: The attraction of foreign direct investment depends on tax exemption within Mexico from 2000 to 2012
- H<sub>6</sub>: The attraction of foreign direct investment depends on natural resources endowment within Mexico from 2000 to 2012
- H<sub>7</sub>: The attraction of foreign direct investment depends on gross national product in Mexico from 2000 to 2012
- H<sub>8</sub>: The attraction of foreign direct investment depends on the legal framework within Mexico from 2000 to 2012
- H<sub>9</sub>: The attraction of foreign direct investment depends on geographical location of Mexico from 2000 to 2012
- H<sub>10</sub>: The attraction of foreign direct investment depend on industrial policy within Mexico from 2000 to 2012
- H<sub>11</sub>: The attraction of foreign direct investment depend on the improvement of the determinants within Mexico from 2000 to 2012.
- H<sub>12</sub>: The probability of determinants improvement will attract more foreign direct investment flows.

### 3.4. Data

Ninety six state development plans were reviewed by the authors to build a database for this research. These plans were accumulated by the government of each state of Mexico. The determinants used to attract foreign direct investment by the 32 states during 2000 and 2012 were skilled labour, cheap labour, tax exemption, legal framework, security, natural resources, infrastructure, gross national product, industrial policy and geographical location which according to different authors, are the most common used around the world despite that it is not clear if the determinants are new or renewal for countries.

### 4. Descriptive Statistics

The period studied (2000-2012) showed that the maximum intake of foreign resources by Mexico was \$ 22062.50 billion USD in 2001 while there was also a divested FDI by \$ 531.50 in 2005. In 2009 and 2010 there was a fallen in the attraction of FDI because of the financial crisis worldwide but in 2012 the fallen was worst that might be caused by the end of President Felipe's Calderon government. In 2013, Mexico began to recover the attraction of FDI (Table 1).

**Table 1**

fdi	Obs.	Mean	Std. Dev.	Min	Max
2000	32	569.52	1629.01	-5.60	9044.10
2001	32	937.00	3877.44	-20.90	22062.50
2002	32	749.60	2925.67	-17.20	16607.20
2003	32	590.51	2017.56	-11.50	11441.10
2004	32	782.42	2593.37	-1.50	14499.10
2005	32	770.90	2395.41	-531.50	12822.20
2006	32	646.84	1827.94	-110.00	10284.60
2007	32	1005.75	3134.92	-51.30	17802.00
2008	32	885.52	2421.98	-17.10	13753.20
2009	32	532.98	1605.22	-59.90	9039.00
2010	32	719.60	1673.63	-26.90	7987.00
2011	32	719.03	2581.73	-147.40	14748.00
2012	32	538.24	1153.70	-62.60	6540.50
2013	32	1099.64	3820.40	-136.10	21882.50
Total	448	753.40	2501.16	-531.50	22062.50

Table 2 shows the maximum and minimum values of foreign direct investment by the 32 states of Mexico. The states that capture the greater foreign direct investment were Distrito Federal, Nuevo Leon, Estado de Mexico, Chihuahua and Jalisco and the states that captured the less were Hidalgo, Guerrero, Chiapas, Colima and Oaxaca.

The states that attracted the largest amount of investment created or renewed some determinants that allowed them to attract greater investment flows while states that captured lower flows neither create nor renewed determinants. For example, Distrito Federal is the capital of the country and many international headquarters are established there. As for the case of Nuevo Leon, the decision of create or renew determinants has become an important role in public policy because of the attraction of capital flows to aeronautical and aerospace industries.

**Table 2**

fdi	Obs.	Mean	Std. Dev.	Min	Max
Aguascalientes	14	233.94	194.47	8.00	665.90
Baja California	14	904.88	250.83	542.20	1555.00
Baja California Sur	14	341.33	186.84	81.30	630.10
Campeche	14	2.61	62.71	-136.10	110.40
Chiapas	14	13.03	16.39	-11.20	41.80
Chihuahua	14	1203.76	452.45	584.60	1920.60
Coahuila	14	333.29	353.79	121.60	1221.80
Colima	14	17.87	19.91	-4.70	64.60
Distrito Federal	14	13465.21	4867.22	6540.50	22062.50
Durango	14	180.39	189.55	-21.00	574.50
Estado de México	14	1244.10	762.91	545.20	3576.80
Guanajuato	14	256.66	224.61	-70.20	734.00
Guerrero	14	31.01	45.17	-48.00	110.30
Hidalgo	14	5.60	30.26	-62.60	77.50
Jalisco	14	781.85	429.22	289.40	1866.00
Michoacan	14	132.19	422.74	-110.00	1590.30
Morelia	14	101.27	143.75	-56.30	453.30
Nayarit	14	88.39	46.18	19.90	180.30
Nuevo León	14	2260.60	1422.74	524.80	5379.70
Oaxaca	14	20.56	25.72	-1.60	78.50
Puebla	14	472.50	408.57	-531.50	1261.30
Quintana Roo	14	260.29	223.84	14.30	885.70
Querétaro	14	325.19	191.66	56.20	661.80
San Luis Potosí	14	163.57	137.30	-13.90	509.40
Sinaloa	14	79.00	94.34	13.20	349.20
Sonora	14	305.34	308.25	37.80	1286.40
Tabasco	14	54.61	50.70	0.90	150.90
Tamaulipas	14	401.66	143.08	208.00	723.80
Tlaxcala	14	35.34	39.04	-17.20	136.50
Veracruz	14	87.87	103.78	-147.40	272.10
Yucatán	14	39.05	33.26	5.50	132.90
Zacatecas	14	265.73	447.60	0.10	1517.00
Total	448	753.40	2501.16	-531.50	22062.50

## 5. Methodology, Models and Results

### 5.1. Methodology

To test the hypotheses proposed in this research were carried out several models of time series data, the results for these models indicate the nature of each of the variables used, and the relationship they have with the dependent variable and its statistical significance.

Once we have variables that will be employed in a probit model originally used by Bliss (1934) as well as applied to stochastic models by Steinbrecher and Shaw (2008) it was necessary

to check and simulate the dependent variable (*impde*), which was developed as the probability that there is an improvement in the determinants that each one of the Mexican states raised in their public policies and in their development plans, related to foreign direct investment flows. The probit model tested the hypotheses and the main objective of this research.

It is important to note that the probit model was used to propose a new theory of attraction of foreign direct investment based on the creation of new determinants or renewal thereof as part of the public policy of the countries. The database developed for this study contains data on the determinants used by each of the states of Mexico for a period of twelve years. During those years, there are states that do not use the ten determinants commonly used to attract foreign direct investment or there are states that decide to improve the determinants and previously used by the states. In any of these circumstances apply to the proposal of the new theory.

## 5.2 Models

The following equations are the proposal models to prove the hypotheses postulated earlier, the

Main model is:

$$fdi_t = \beta_0 + \beta_1 ifra_t + \beta_2 qualab_t + \beta_3 wage_t + \beta_4 sec_t + \beta_5 taxex_t + \beta_6 natures_t + \beta_7 gnp_t + \beta_8 legal_t + \beta_9 geoloc_t + \beta_{10} indpol_t + \beta_{11} impde_t + u_t$$

Model for H<sub>1</sub>

$$fdi_t = \beta_0 + \beta_1 ifra_t + u_t$$

Model for H<sub>2</sub>

$$fdi_t = \beta_0 + \beta_1 qualab_t + u_t$$

Model for H<sub>3</sub>

$$fdi_t = \beta_0 + \beta_1 wage_t + u_t$$

Model for H<sub>4</sub>

$$fdi_t = \beta_0 + \beta_1 sec_t + u_t$$

Model for H<sub>5</sub>

$$fdi_t = \beta_0 + \beta_1 taxex_t + u_t$$

Model for H<sub>6</sub>

$$fdi_t = \beta_0 + \beta_1 natures_t + u_t$$

Model for H<sub>7</sub>

$$fdi_t = \beta_0 + \beta_1 gnp_t + u_t$$

Model for H<sub>8</sub>

$$fdi_t = \beta_0 + \beta_1 legal_t + u_t$$

Model for H<sub>9</sub>

$$fdi_t = \beta_0 + \beta_1 geoloc_t + u_t$$

Model for H<sub>10</sub>

$$fdi_t = \beta_0 + \beta_1 indpol_t + u_t$$

Model for H<sub>11</sub>

$$fdi_t = \beta_0 + \beta_1 impde_t + u_t$$

Model for H<sub>12</sub>

$$P(\text{impe}_t) = \beta_0 + \beta_1 fdi_t + u_t$$

### 5.3 Results

Because the models that we have presented were handled through time series, we had to verify first if variables have a stationary stochastic process in the models proposed. Also by whether in the case of the variables present a nonstationary process, the models are not useful for finding reliable results by the method of ordinary least squares (OLS), but in accordance with Engle and Granger (1987) that conducted a cointegration process, we decided to make a linear combination of two series, each of which is integrated of any kind of order. In addition we checked and corrected the errors through the Granger causality (Granger, 1969 and Granger and Newbold, 1974) to verify that indeed the time series used are stationary, the following model show this test and in the Table A1 are the results of them:

$$fdi_t = \delta_0 + \alpha_1 fdi_{t-1} + \alpha_2 fdi_{t-2} + \alpha_3 fdi_{t-3} + \alpha_4 fdi_{t-4} + \gamma_1 ifra_{t-1} + \gamma_2 ifra_{t-2} + u_t$$

In addition, was revised collinearity of the variables through a model of vector autoregressive (VAR), where it was found that indeed the variables presented a high collinearity and that has to be corrected for the variables are stationary, besides we use the Wald test (Wald, 1940) to prove if the model has an asymptotic chi-square distribution, the model was as follows and in the Table A2 are presented the results of them:

$$fdi_t = \delta_0 + \alpha_1 fdi_{t-1} + u_t$$

Once we had corrected the errors that could be present in the time series, and we were sure that the variables shown a Stationary Stochastic Process we proceeded to find the corresponding relations with each of the proposed variables as determinants for foreign direct investment flows that have been submitted in Mexico in the period proposal from 2000 to 2012.

The interaction of all independent variables in the Main model is shown with respect to the dependent variable in Table A3. It was expected that all the variables were significant but, the independent variables *ifra*, *sec*, *legal* and *geoloc* (corresponding to Infraestructure, Security, Legal system and Geografic Localization) were not. Subsequently, the interaction of the dependent variable with each of the independent variables was done to confirm its significance (Models for H<sub>1</sub> to H<sub>11</sub>). The results (see tables A4 to A15) demonstrate that all the variables have a high significance.

Once interactions were tested using linear regressions, a simulation using the *probit* model (Model for H<sub>12</sub>) was done. The results showed that the probability of an improvement in the determinants increased flows of foreign direct investment.

## 6. Conclusions

The theories proposed by several authors to explain how countries attract FDI are diverse. Some are based on the use of different determinants as part of its public policy. In this sense, during the period 2000-2012, Mexico used ten determinants in common for each of the 32 states to attract foreign direct investment, however, the safety-related determinant not found to be significant as part of its public policy because it is now known that Mexico is facing serious security problems and cannot use that determinant in attracting foreign direct investment. There are positive relations between the rest of the determinants and the dependent variable which is coherent with the literature review.

Since the period studied is twelve years, it was observed that some states of Mexico during that period decided to create or renew their determinants in order to attract more and new flows of foreign direct investment, so this article is based on the proposal of a new theory



that studies the creation of new or renewal of the determinants used by governments as part of their public policy. The probit model demonstrates that relationship.

If any government in the world is interested in attracting new or more foreign direct investment it must create or renovate determinants used to attract investment flows. There are probably cities or provinces who want to attract resources for certain types of industry, but they must create or renew the related determinants, such that the different types of industry prevailing in a country use different determinants and some of them they shall not be used to attract new resources and should focus on the development of new determinants.

Such is the case of the State of Nuevo Leon in Mexico that sought to attract investment flows for a new industry in the state such as aerospace and aeronautical. The state government of Nuevo Leon had to create and renew the determinants traditionally used to attract investment flows to other industries and create or renovate suitable ones for aerospace and aeronautics.

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## Appendix

Table A1. Econometric results for the Vector Autorregresive (VAR) models, to prove collineality.

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
fdi						
L1	0.4306679	0.0461224	9.34	0.000	0.3402697	0.5210661
L2	0.3804776	0.0461891	8.24	0.000	0.2899486	0.4710067
ifra						
L1	-975.7836	577.5145	-1.69	0.091	-2107.691	156.1241
L2	1123.365	574.9412	1.95	0.051	-3.499405	2250.229
qualab						
L1	1366.324	498.5146	2.74	0.006	389.2537	2343.395
L2	-1268.267	495.873	-2.56	0.011	-2240.16	-296.3732
wage						
L1	1407.241	480.625	2.93	0.003	465.2329	2349.248
L2	-1220.12	481.8106	-2.53	0.011	-2164.452	-275.7891
sec						
L1	-385.2097	388.8907	-0.99	0.322	-1147.421	377.0021
L2	137.0567	390.072	0.35	0.725	-627.4703	901.5837
taxex						
L1	-167.8146	372.4278	-0.45	0.652	-897.7597	562.1306
L2	179.5967	375.0052	0.48	0.632	-555.4	914.5934
natures						
L1	-1259.199	375.3069	-3.36	0.001	-1994.787	-523.6109
L2	977.642	376.3549	2.6	0.009	240	1715.284
gnp						
L1	53.92237	477.2691	0.11	0.910	-881.5079	989.3526
L2	-21.31266	477.5679	-0.04	0.964	-957.3586	914.7032
legal						
L1	640.9021	416.9201	1.54	0.124	-176.2463	1458.05
L2	-717.5595	411.4749	-1.74	0.081	-1524.036	88.91654
geoloc						
L1	-472.3277	533.0303	-0.89	0.376	-1517.048	572.3926
L2	518.8095	532.957	0.97	0.330	-525.7671	1563.386
indpol						
L1	-1115.89	515.1683	-2.17	0.030	-2125.601	-106.1786
L2	1198.99	513.3238	2.34	0.020	192.8936	2205.086
impde						
L1	1433.092	599.1245	2.39	0.017	258.8298	2607.355
L2	-1407.566	600.8904	-2.34	0.019	-2585.289	-229.8425
_cons	62.0544	258.102	0.24	0.810	-443.8162	567.9251

Table A2. Econometric results for find the Granger causality Wald tests.

Equation	Excluded	chi2	df	Prob > chi2
fdi	ifra	3.845	2	0.146
fdi	qualab	7.5706	2	0.023
fdi	wage	8.8491	2	0.012
fdi	sec	2.4035	2	0.301
fdi	taxex	0.23293	2	0.890
fdi	natures	11.594	2	0.003
fdi	gnp	0.03053	2	0.985
fdi	legal	3.0496	2	0.218
fdi	geoloc	0.94766	2	0.623
fdi	indpol	5.5766	2	0.062
fdi	impde	6.1225	2	0.047
fdi	ALL	43.089	22	0.005

Table A3. Econometric results to prove the Main model

fdi	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
ifra	-547.8538	361.1838	-1.52	0.130	-1257.732	162.0241
qualab	1266.74	320.7606	3.95	0.000	636.3107	1897.169
wage	1138.888	251.3386	4.53	0.000	644.9022	1632.874
sec	-128.5826	255.4228	-0.5	0.615	-630.5956	373.4304
taxex	683.1313	254.2622	2.69	0.007	183.3994	1182.863
natures	-1912.049	261.5689	-7.31	0.000	-2426.141	-1397.956
gnp	546.2715	298.5431	1.83	0.068	-40.49106	1133.034
legal	418.4257	312.1928	1.34	0.181	-195.1642	1032.016
geoloc	-76.04623	316.8791	-0.24	0.810	-698.8468	546.7543
indpol	-948.275	391.3048	-2.42	0.016	-1717.353	-179.1967
impde	993.2183	483.0923	2.06	0.040	43.73906	1942.698
_cons	562.8327	363.7085	1.55	0.122	-152.0073	1277.673

Table A4. Econometric results to prove H<sub>1</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ifra	757.964	275.1266	2.75	0.006	217.2584	1298.67
_cons	176.4636	240.0329	0.74	0.463	-295.2725	648.1996

Table A5. Econometric results to prove H<sub>2</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
qualab	1225.851	229.4586	5.34	0.000	774.8967	1676.806
_cons	124.0528	164.4104	0.75	0.451	-199.0626	447.1681

Table A6. Econometric results to prove H<sub>3</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
wage	872.0624	236.5037	3.69	0.000	407.2623	1336.863
_cons	391.3344	152.3897	2.57	0.011	91.84338	690.8253

Table A7. Econometric results to prove H<sub>4</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sec	403.4132	242.4956	1.66	0.097	-73.16277	879.9892
_cons	598.5141	150.2551	3.98	0.000	303.2183	893.81

Table A8. Econometric results to prove H<sub>5</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
taxex	1197.795	232.3908	5.15	0.000	741.0784	1654.512
_cons	242.7288	151.7388	1.6	0.110	-55.48297	540.9406

Table A9. Econometric results to prove H<sub>6</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
natures	-981.9573	233.3849	-4.21	0.000	-1440.628	-523.2866
_cons	1296.979	173.6439	7.47	0.000	955.7176	1638.241

Table A10. Econometric results to prove H<sub>7</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gnp	1420.298	237.5572	5.98	0.000	953.4279	1887.169
_cons	246.1465	141.9676	1.73	0.084	-32.86201	525.1551

Table A11. Econometric results to prove H<sub>8</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
legal	761.7603	248.067	3.07	0.002	274.235	1249.286
_cons	246.6893	202.3196	1.22	0.223	-150.9289	644.3076

Table A12. Econometric results to prove H<sub>9</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
geoloc	540.6997	319.2987	1.69	0.091	-86.81721	1168.217
_cons	300.8014	292.1284	1.03	0.304	-273.3178	874.9205

Table A13. Econometric results to prove H<sub>10</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
indpol	715.055	316.7725	2.26	0.024	92.50291	1337.607
_cons	156.4527	289.4305	0.54	0.589	-412.3642	725.2696

Table A14. Econometric results to prove H<sub>11</sub>

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
impde	878.5583	251.8138	3.49	0.001	383.6694	1373.447
_cons	149.3871	208.7929	0.72	0.475	-260.953	559.7273

Table A15. Econometric results to prove H<sub>12</sub>

impde	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
fdi	0.0010048	0.0002014	4.99	0.000	0.0006101	0.0013996
_cons	0.1999643	0.0775323	2.58	0.010	0.0680037	0.3519249

# The role of information communication technology (ICT) in enhancing productivity in local government administration in Benue State, Nigeria

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## Key wards

*Information Communication Technology, Productivity, Local Government Administration, Role.*

## Abstract

*The rationale for this research survey is to establish the need for the third tier of government to embrace ICT to enhance its performance. The objective of this study is to ascertain the effectiveness of the role of Information Communication Technology (ICT) in enhancing productivity in the local government administration, in Benue State, Nigeria. The researcher adopted a quasi experimental research design technique. The population for this study consisted of all the 23 local governments in Benue State in which 5 employees were judgmentally sample using 5-point Likert scale questionnaire. Pearson chi-square test was employed in testing the two (2) formulated hypothesis. The findings from the research revealed that Information Communication Technology (ICT) have played a positive role in areas of computerization of Internal Accounting, payroll operations, word processing and Budget planning and administration, job costing, scanning documentation and mapping, decision support, online training/learning, urban planning amongst others in the 23 local government areas of Benue State, Nigeria. The study also found that there exist several problems militating against ICT effective applications. These problems include lack of technical skills, acquisition of obsolete equipment, erratic power supply, ineffective regulation amongst others. The research recommended that local government administrators should make further investment in Information Communication Technology (ICT) a top priority as it is proven that it is a catalyst for development in areas of education, health, secretariat administration, proper financial reward keeping, politics, governance, culture, business and production.*

## 1. Introduction

Information needs are escalating. A complex and rapidly changing environment requires that managers, administrators obtain extensive information about competitors, regulators, customers and more on a global basis. Also, empowering employees to improve quality and efficiency requires organizations to disseminate information about internal performance and external demands. At the same time, information overload requires that information be clear and meaningful, or else it may not be perceived at all (Patrick Wright and Raymond Noe, 1996). Information is data that are organized in a meaningful fashion (George and Jones, 2006). According to Griffins (1997) Information Communication Technology (ICT) refers to the resources used by an organization to manage information that it needs to carry out its mission. ICT may consist of computers, computer networks, and other pieces of hardware. In addition, ICT consist of software that facilitates the systems abilities to manage information in a way that is useful to managers, administrators and employees in organization. They are electronic hardware and software used for communications and information processing.

Arokoyo (2008) views ICT as technology used to exchange, process and communicate information and knowledge by electronics ranging from radio and television to telephones (fixed and mobile), computers and internet. ICT can also be described as a new techno-economic paradigm which has experienced the most rapid development and taken the field of micro-

electronics, informatics, data processing and communication into areas of life which only a few years ago were an exclusive preserve of space and advance manufacturing system (Kagbojola, 2004).

Discoveries in microelectronics, information processing and communication technology have no doubt revolutionized the global system (Sani, 2010). There is so much information moving around the world than before. The convergence of computer and communication technologies is promoting the development of computer-mediated networks. These networks are formed by system of computer and communication hardware and software which allow users to communicate and transmit data and other types of information across National boundaries (Sani, 2010).

Agboola (2006) observed that some payments are now being automated and absolute volume of cash transactions are brought about by the adoption of ICT to the payment system both in developed and developing Nations. Emmanuel and Sife (2008) noted that positive effects of ICT have continually been noted in business, production, education, politics, governance, culture and other areas of human endeavour. The above position is reinforced by Agboola (2004) and Ayo (2006) who stated that, the growing rate of ICT particularly the internet has influenced at an exponential rate online interaction and communication among the generality of the populace.

Rao, Metts and Mong (2003) observed that the 1990's witness the proliferation and hyper growth of internet and internet technologies which together are creating a global and cost effective platform for business to communicate and conduct commerce.

The aim of information communication technology is to make organizing and disseminating information faster, easier, and more accurate than before. Many applications of information communication technology are common place today. Databases make it easy to find a particular pieces of information, word-processing programs makes the creation of documents efficient, and electronic mail (e-mail) and computer bulletin boards are fast ways to send and receive messages. Pagers, cellular phones, and laptop and palmtop computers give traveling employees access to information where and when they need it. Computer-integrated manufacturing keeps operations flexible and aligned with strategy as well.

### 1.1 Characteristics of Useful Information

What factors differentiate information that is useful from information that is not useful? Griffins (1997) noted that, for information to be useful, it must be accurate, timely, complete and relevant.

**1.1.1 Accurate:** For information to be of real value to an administrator, manager etc, it must be accurate. Accuracy means that the information must provide a valid and reliable reflection of reality. Accuracy and reliability determines the quality of information. The greater the accuracy and reliability the higher the quality of information. For ICT to work well, the information that it provides must be of high quality. This may facilitate good decision by Administrator/managers resulting to good governance.

**1.1.2 Timely:** Information also needs to be timely. Timeliness does not necessarily mean speediness; it means only that information needs to be available in time for appropriate administrative/managerial action, not after the decision has been made. In today's rapidly changing world, the need for timely information often means that information must be available on a real time basis. Real time information is information that reflects current conditions. Real-time information may need to be updated frequently.

**1.1.3 Completeness:** Information that is complete gives administrators/managers all the information they need to exercise control, achieve coordination, or make an effective decision.

**1.1.4 Relevance:** Information that is relevant is useful and suits administrator/managers particular needs and circumstances. Irrelevant information is useless and may actually hurt the performance of a busy personnel who has to spend valuable time determining whether information is relevant.

## 1.2. Components of Information Communication Technology (ICT)

Information Communication Technology (ICT) according to Cole (2003) is a combination of basic related technologies. These are;

- a. Computers
- b. Telecommunications and electronics.

All these have application in industrial settings, where it is employed for process control, machine control, and for monitoring. However, it is in the office settings that ICT truly comes into its own, for the very reason that offices are above all else, centres of information processing, storage and distribution.

**A. Computer System:** As observed by Woherem (2001), a computer is an electronic device that uses instructions provided to it, which is stores in its memory unit, to accept data input from its peripherals. It processes the data input using its arithmetic and logic processing units, and then produces outputs from its internal processing, while storing the results for use in the future. This definition of a computer include things like *Handhold computers, Palmtops, Notebooks, Personal Digital Assistant (PDAS), Desktops, workstations, minis, mainframe computers as well as supercomputers.*

**Computer process data:** Data refers to raw facts like numbers, words, images and sounds that are fed to a computer as input. Data is processed to create information. The word information is used to refer to data or sets of data that have been processed and/or manipulated to provide something meaningful and useful. Computer systems are made up of 2 major components for them to carry out their data or information processing function.

### **The two parts are hardware and software**

*Computer hardware* refers to the physical components of the computer i.e. these aspects of the computer that are physically manipulated. *Computer software* refers to the sets of instructions that are fed into the machine that enable the computer to process data/information.

In order to carryout information processing, a computer needs an *input device*, a processing device, and an *output device*. It also needs a storage device in order to store the data or information it process.

*Input devices* are the devices used to enter data into a computer. The most commonly used input devices are the *keyboard* and the *mouse*. The keyboard is like the keyboard of typewriters. A mouse is a device, which could be held and used to move a pointing device about, usually in the shape of an arrow on the screen of a computer.

There are 2 major types of software. The first type is application software the word-processors, spreadsheets, transaction processing systems, databases and personal information management systems. The other one is the operating system software which enables application to be run.

The mainframe computers are used for large volume data processing commitments, as they are capable of operating automatically at higher speed. They printout invoices, pay slips, payrolls, purchase orders, cheques and remittances advice slip in greater volumes in a very short space of time.



### 1.2.1. Characteristics of Computer

The following constitute the most common attributes of a computer. They are:

- i. **Speed** – The computer is able to act and do things very quickly. Computers work at incredible speeds, performing hundreds, thousands and even millions of calculations in a second.
- ii. **Accurate** – The computer produces accurate or correct answers only to any given problem. The computer does not make mistakes like human beings. Once it is told what to do and how to do it, the computer does the job exactly the same way, no matter how many millions times the work has to be repeated.
- iii. **Reliable** – Once it is properly kept and electricity supply is on at all times, the computer does not need to go on break. It will never complain of being overworked – no closing time, all day everyday for years.
- iv. **Computers have memory like that of human being** – Once you teach the computer how to add, subtract or multiply numbers, it never forgets again. Because of this property, many people sometimes take the computer to be superior at least better than human beings.
- v. The computer is in a way different from human beings because it cannot yet think. It is only able to do exactly what it is told to do and no more. Somebody has to tell the computer what to do at all times.
- vi. The computer can keep or store large amount of records or data, in very little space. A whole book can be stored on just one diskette or CD-ROM.
- vii. It is very easy and quick to ask for and obtain the information stored in the computer. In other words, retrieval of data is quite easy and fast.

### 1.2.2. Importance of Computers to Human Development

Ogala (2003) noted that a computer system was first used primarily as a tool for calculating large number by scientists and the military. Gradually, it became useful in offices and industries mainly as a process control and data processing tool. Presently, the computer has become a common tool in schools and homes for accomplishing many varied tasks and applications.

The computer is now a tool that does many things such as:

- a. Writing letters and reports
- b. Printing books, newspapers and magazines
- c. Drawing pictures and diagrams
- d. Doing statistics, mathematics and handling financial records
- e. Controlling traffic lights
- f. Flying Aeroplanes.
- g. Making and playing music including video films.
- h. Sending messages to other persons anywhere in the world.

In Nigeria today businessmen and women including governmental organization and private organizations make use of computers to process activities. Business and public sector organizations install computers to reduce administrative paperwork and cost. Some of the way it is accomplished includes:

- a. Secretariat departments use business computers to perform word processing task which decreases their workload by almost fifty percent.
- b. Record – Keeping departments search for, retrieve, alphabetize, recalculate, print and process information in a fraction of the time with the aid of computers.

- c. Payroll departments handle the payroll with its many salary levels, commissions, tax withholding, and pay cheque issuing by the aid of computers.
- d. Production and inventory departments with the help of computers carefully monitor all phases of operation, such as cost effectiveness and the ordering of all supplies that will be needed to complete a given task.

Computers also plays a vital role in the lives of patients in the hospital. Without computers, it would be too costly to monitor borderline patients around the clock and many would die. Similarly in the operating room, computer displays data about the patient's vital signs and sound warnings if serious problem occurs. Computer Axial Tomography (CAT) scanner now enable doctors to see things that never show up on ordinary x-rays. Computer Axial Tomography (CAT) is a non surgical means of viewing the body using a computer display produced by series of x-rays. A CAT scanner can rotate around the patient, taking sources of x-rays in a matter of minutes. A computer then processes the x-rays and generates a screen cross-sectional images of the patients body.

Furthermore, computers also help to interpret laboratory test. This is called computer-Aided Diagnoses. Some number of ways Hospitals, medical clinics of the Local, State and Federal government can use computer are:

- a. To study diseases such as heart diseases and cancer.
- b. To train doctors and other health personnel.
- c. To perform routine record-keeping tasks, thereby permitting doctors and nurses to spend more time with patients.
- d. To speed processing of laboratory tests.
- e. To analyze brain waves (Researchers are investigating fatigue, stress, and mental illness).
- f. To monitor pulse, temperature, blood pressure and other vital signs.
- g. To provide early warning profiles of illness.
- h. To record aspects of medical treatments.
- i. To perform medical stimulations.
- j. To keep doctors informed of changes in the medical files (medical information banks).

Computer are also important to law enforcement as a device for detecting crimes to a greater extent.

### **The Internet**

The internet is a huge network of computer networks. There are virtually millions of separate computer networks today around the globe. The internet links million of people and thousands of companies, educational institutions and many other types of organizations worldwide and enables them to be able to communicate with one another. It is the network that interconnects most of the other industrial network in the world through a common communication protocol called TCP/IP.

Another term that is used to depict the essence of the internet is cyberspace. It refers to the other world of electronic communication in which individuals or organizations push data and information around to other individuals or organizations around the world. It has created a global marketplace in which people can carry out trade (e-commerce), shop, do their banking, browse libraries, visit museums.

Some examples, of services offered over the internet are provided below:

- a. E-Mail (Electronic Mail)
- b. File Transfer Protocol (FTP)
- c. Terminal Emulation Link Network (telnet)
- d. New Groups

- e. Gopher
- f. World Wide Web.
- i. **E-Mail** – This is the most used of all the services provided by the internet. Millions of people with internet access can be reached through the net by e-mail.  
Using e-mail, or electronic mail, is just like sending a letter to someone located elsewhere geographically.  
E-mails could be sent to people within the same building who are sharing a Local Area Network (LAN), or by people geographically dispread but are interconnected via a Wide Area Network (WAN).  
They could also be sent by people connected to the internet to other people who have access to the internet. To contact an individual, you create a text file, address the file and send it to the recipient's address.
- ii. **WWW** – The WWW is today what is driving the internet. It allows all kinds of documents containing texts, videos, sound and dynamic graphics or pictures to be hyperlinked together. The entire collection of these documents, stored in computer systems (called websites) around the world, is what is known as the WWW or World Wide Web.  
You can view the web pages using a web browser. Mosaic, Netscape, Navigator and Microsoft Explorer are 4 examples of web browsing programs.  
Netscape seems to be the most popular, but with Microsoft explorer catching up very fast.
- iii. **FTP** – File Transfer Protocol (FTP) enables people to be able to receive files from the net. FTP provides a giant electronic library of computer files. Infact, certain computers on the Net act as FTP sites. There are servers that users can log onto, to use the FTP software to request for files, which the FTP sites would then send to them. There are FTP sites throughout the world for any area of interest.
- iv. **Telent** – (Terminal Emulation Link Network). When a user wants to connect to a distant computer system because it has specialized programs, he or she can access it through the internet using telnet. To use telnet, the user must have an account on the distant computer or a free account must be available for he/she to use. In this way, a user can access programs and data on a distant computer as if he/she were at the distant computer's console.
- v. **News Groups**: Newsgroups are discussion groups. They are message areas where people can discuss a common area of interest. They are different from traditional broadcast news in that people can contribute to the content of the group as well as read it.
- vi. **Gopher** – This is a text viewer that can be used to follow linkages between documents. These linkages, called hyperlinks, may connect files anywhere in the world. Gopher usually display documents in a menu or free structure. Text documents that contain hyperlinks are known as hypertext.
- B. **Telecommunications**: This is a form of technology that is used to bring about the communication of voice and data signals over some geographical distance. It started in 1837 with the invention of the telegram by Samuel Morse. The Morse code, as the invention was called, was used to transmit information using electrical impulses over a copper wire. Messages were transmitted by translating characters into a sequence of long or short electrical impulses (called dots and dashes), that are then transmitted to a recipient.

Alexander Graham Bell improved upon the telegram in 1876. He showed that instead of transmitting voice signals through dots and dashes, it could be done by converting voice directly to electrical energy which is then transmitted over a wire (e.g. copper wire). This is done by continuously varying voltages such that at the other end of the communication

spectrum, the electrical energy is converted back to sound. This way, telephones were born (invented), and that was the major starting point of telecommunications.

It meant that as far as you have phones that are momentarily interconnected via a pair of wire, the other person (the recipient of the phone call) could pick up the phone and start a chat with the caller. Telephones were made to ring bells for the recipient to hear and pickup. Switchboards were later invented to make it possible for a caller to simply pick up a phone and dial any number. The switching devices could then send the call to the correct phone number of the would – be recipient.

Today, telephone have become ubiquitous at offices and homes. They can now not only be used in communicating voice but also data in the form of graphics, pictures, numbers, video and a multimedia of different data types. Instead of mere copper wires, we now have other transmission media like fiber optics, radio and satellites. Digital signals are now replacing analog ones.

In Nigeria today, we have a large number of telecommunication operators and companies. They are;

1. MTN Telecommunication
2. Globacom Telecommunications
3. Etisalat Telecommunication
4. Airtel Telecommunications etc.

All these Networks are extensively used by offices, homes and individuals to enhance business transactions, administrative operations and E – governance by disseminating important information.

Today computers and telecommunication are two main technologies of gathering, analyzing, manipulating, storing and communicating data. Today, the word data encompasses voice, text, numbers, fax, graphics, picture, video and multimedia. They reduced face-to-face meetings and it facilitates transactions. Radio and Televisions too have been playing enhancing roles in this regards as well.

### **1.3. The Role of Information Communication Technology (ICT) in Local Government Administration**

The Universal Declaration Human Rights (UDHR) states that everyone has the right to take part in the government of his or her country. The role of ICT in facilitating (political) information exchange is manifested in the ways information flows-faster, more generously, and less expensively throughout the planet for decision-making and for development (Ahmed, et al, 2006). Gurumarthy (2004) defined E-governance as the use of ICTs to improve government interaction with citizens. ICTs facilitate the sharing of information or ideas by different nations of the world. They can improve government and strengthen democracy and citizen empowerment, and can help foster most transparent governance by enhancing interactions between government and citizens (United Nations Economic and Social Council, 2000). It can be particularly powerful in providing a voice to people who have been isolated and invisible. The objective of E-administration is to enhance transparency and accountability, leading to better governance (Bagozzi et al, 1992). Local Government Administrators must understand the power of technology and acquire the necessary knowledge and skills (Davis, 1992).

Moemeka (1994), Shepherd (1998), the United Nations (2005) and Nassanga (2001) explore the power of ICT in development and empowerment. Information leads to self actualization, especially when combined with other resources (Castels, 2003). ICT speeds up the flow of information and its use in decision-making (Ahmed et al, 2006). Bagozzi, et al (1992)

reinforced this position by stating that the benefits of ICT include accuracy, speed, enhanced communication process/mechanism, increased productivity, and acquisition of skills and knowledge. Mike Jensen (2002) in his research on the ICT as a tool for improving local governance in Africa with special survey on selected African municipalities (Zanzibar, Lusaka and Mapute noted as follows;

*That E-governance is the use of ICTS to promote more efficient and effective government, facilitate more accessible government services, allowing greater public access to information, and making government more accountable to citizens. This would involve delivering services to the public via the internet, telephone, public access centers, wireless devices or other communications and information systems. Some of the operational benefits and roles of ICT identified here were;*

- a. Computerization of internal accounting and payroll operations.
- b. Computers would also normally be used for word processing and budget planning (usually a spreadsheet, although some accounting systems would also have this functionality).
- c. Other common internal functions that also often employ the use of ICTS would be:
  - Job costing,
  - Purchase orders,
  - Avoid stock out,
  - Work orders,
  - ICT enhances flexibility in decision making process of governance,
  - Avoid delays in all manner of transactions.

Because of their importance in ensuring income generation and also because they can be built relatively easily on to the accounts payable system, the Information Communication Technology (ICT) application can be made valid in local governance in areas such as:

- Rates/tax administration
- Water and electricity billings
- Business licenses
- ICT would also assist operations such as:
  - i. Staff support (schedules, contract management, e-mail, web access).
  - ii. Scanning documentation and mapping
  - iii. Waste management.
  - iv. Council property management.
  - v. Roads and pavement management.
  - vi. Vehicle and fuel management.
  - vii. Inspections
  - viii. Urban planning-land titles, subdivisions and zoning applications.
  - ix. Building permit applications.
  - x. Local elections/voting.
  - xi. Public transport information
  - xii. Public health information.
  - xiii. Distance education/training and interaction with the public
  - xiv. Decision-support
  - xv. Intergovernmental communications.
  - xvi. Online publications.
  - xvii. Information exchanges
  - xviii. Training courses, workshops, conferences in matters relating to government.

- Public policy and public management will be organized using electronic distance training and conferences. Computerized land register projects will be executed by the National Directorate of Geography, management of lands, mapping of National territory, production of national territory, production of geo-reference information and the management of the right to its exploitation.
- Simplification of problem solving by the use of problem solving software like internet/telephones.
- Supply of information for improving managerial decisions.
- Assist in online executive training for administrators.
- Greater degree of systems integration on the basis that the output of are part of a system provides the input to a related subsystem which was the effect of eliminating duplications and delays.
- It is also important to emphasis that, for good governance, government information needs to be communicated to stakeholders like individuals and businesses for optimal investment decisions making. A number of governments have therefore embarked on e-government initiatives.

For example: -

	Scope	Country	Continent
1. e-Ghana	Country wide	Ghana	Africa
2. e-UK	Country wide	Britain	Europe
3. e-New Zealand	Country wide	New Zealand	Europe
4. Missouri e-Government Project	State wide	America	North America

#### 1.4 Problems Militating Against Information Communication Technology (ICT) Applications in Nigerian Organizations

Today, scholars have identified several problems militating against the adoption of Information Communication Technology (ICT) in Nigerian organization. As observed by Oladejo and Adere (2010), the problems are;

- i. Inadequate awareness about Information Communication Technology (ICT) and ineffective technical knowledge in manning ICT gadgets.
- ii. Negative attitude of the government through inadequate funding.
- iii. Inadequate power supply: Government inability to provide a stable power supply has hindered the effective functioning of ICT system.
- iv. Ineffective regulatory mechanism by the Nigeria Communication Commission (NCC) by not adopting to established benchmarks resulting to epileptic symptoms and frustration in communication Networks.
- v. Unreliable telecommunication facilities. This is because of poor telecommunication networks in Nigeria. As a result of this transactions in information technology are greatly limited as compared to what exists in other countries.
- vi. Internet fraud and other cyber-crimes may discourage the full adoption of information communication technology concept by the society.
- vii. Lack of technical competence - One area that some work needs to be done in the country if we are to properly embrace information and communication technology is by training of competent professional in the various domains of technology. There is an acute dearth of specialists in LAN, WAN, internet, connectivity, VSAT, Radio, fibre-optics, package switching and wireless telephony technologist in the country.
- viii. Acquisition of obsolete equipment - According to Sev (2000) purchase of wrong and obsolete equipment have also been identified as another factor constraining the rapid

development of Information Communication Technology (ICT). On this note, it is pertinent that well skilled professional be trained to man computerization as well as detect defective parts/installations that are no longer relevant in the system in order to enhance productivity.

### **1.5 Statement of the Problem**

The bid to enhance operational efficiency, improved performance, improved quality of service delivery, to enhance transparency, competitive advantage and sound administrative control mechanism have called to the need to adapt and apply information communication technological (ICT) devices such as computers, telecommunication and electronic appliances. This has aided the processing of information, raw data, pay rolls and keeping accurate records by the local government of Benue State of Nigeria.

The effective application of these will facilitate accurate, reliable, speedy processing of information for a desirable administration. But over the years in the local government administration in Benue State, Nigeria there are several reported cases of ugly practices leading to cybercrimes and manipulations of local government accounts /allocations which have resulted to improper financial record keeping and irregularities against the norms of optimal functioning. These have called for the concern of the researcher to x-ray on this worrisome trend in local government administration in the Benue State, Nigeria.

### **1.6 Objectives of the Study**

- (1) To determine the impact of the role of Information Communication Technology (ICT) on productivity in the local government administration of Benue State, Nigeria.
- (2) To identify the problems militating against the application of information communication technology (ICT) in local government administration in Benue State, Nigeria.

### **1.7 Research Questions**

- (1) To what extent has the role of Information Communication Technology (ICT) impacted on the productivity of local government administration in Benue State, Nigeria.
- 2) What are the problems militating against the application of information Communication Technology (ICT) in local government administration in Benue State, Nigeria.

### **1.7. Research Methodology**

The research design adopted in this investigation was largely Quasi-Experimental one in the sense that it places a premium on sample survey. The population of the study consisted of all the twenty three (23) Local Government Areas of Benue State namely, Ado, Agatu, Apa, Buruku, Gboko, Guma, Gwer-East, Gwer-west, Katsina-Ala, Kwande, Konshisha, Makurdi, Oju, Obi, Okpokwu, Otukpo, Ohimini, Ogbadibo, Ushongo, Tarka, Logo, Vandeikya and Ukum. A judgmental sampling technique is adopted whereby 5 employees each are sample from the respective local government councils. This makes a total sample size of 115. The rationale was to attract the highest level of objectivity so as to guarantee validity and reliability in the research endeavour.

The five point likert rating scale questions ranging from strongly agree, agree, undecided, disagree and strongly disagree were used to sought for responses from the respondents. Pearson chi-square is used for testing the two formulated hypothesis.

### **1.8. Data Presentation and Analysis**

Table 2.1: Respondents opinion as to whether Information Communication Technology (ICT) have played positive roles in areas of computerization of internal Accounting and payroll operations, word processing and budget planning, job costing, scanning documentation, mapping, decision support, online executive training, urban planning amongst others.

Category of Respondents	Local Government Employees	
	No of Respondents	% of Respondents
Response option		
Strongly Agree	52	45.22%
Agree	42	36.52%
Undecided	5	4.35%
Disagree	8	6.96%
Strongly disagree	8	6.96%
Total	115	100%

**Source:** Field data (2013).

In deciding whether Information Communication Technology (ICT) have played positive roles in areas of computerization of internal Accounting and payroll operations, word processing and budget planning, Job costing scanning documentation, mapping decision support, online executive training, urban planning amongst others, it is revealing from data on table 2.1 above that 52 respondents representing 45.22% strongly agree while 42 respondents standing for 36.52% agreed. 5 respondents constituting 4.35% were undecided on this position. 6.96% standing for 8 respondents strongly disagreed while 6.96% standing for 8 respondents disagreed on the notion. This is clearly manifest in the fact that Information Communication Technology (ICT) have played a positive role in computerization of internal Accounting and Payroll operations, word processing and budget planning, job costing, scanning documentation and mapping, decision support, online executive training and urban planning amongst others.

Table 2.2: Respondents views as to whether inadequate power supply, ineffective regulatory mechanism, unreliable telecommunication facilities, lack of technical competence amongst others are the problems militating against Information Communication Technology (ICT) applications in the local government administration in Benue State of Nigeria.

Category of Respondents	Local Government Employees	
	No of Respondents	% of Respondents
Response option		
Strongly Agree	44	38.26%
Agree	52	45.21%
Undecided	4	3.47%
Disagree	7	6.09%
Strongly disagree	8	6.96%
Total	115	100%

**Source:** Field data (2013).

Table 2.2 shows the respondent views as to whether inadequate power supply, ineffective regulatory mechanism, unreliable telecommunication facilities, lack of technical competence, negative attitude of the government amongst others are the major problems. Militating against the effective application of Information Communication Technology (ICT) in Local Government Administration in Benue State, Nigeria in this case affecting productivity attainment.

Up to 38.26% standing for 44 respondents strongly agreed on this note while 45.21% (52 respondents) only agreed to this position. 3.47% of the proportions representing 4 respondents were undecided on this matter. However, 7 respondents representing 6.09% disagreed while



6.96% standing for 8 respondents strongly disagreed that several factors/problems are militating against the application of Information Communication Technology (ICT) in Local Government Administration in Benue States, Nigeria.

### 1.9 Testing of Hypotheses

Two hypotheses were formulated for testing using Pearson chi-square test.

#### Hypothesis 1:

The roles of Information Communication Technology (ICT) have no significant impact on the productivity in the Local Government Administration in Benue State, Nigeria.

**Table 1:** Is Applicable for testing.

O	E	(O - E) <sup>2</sup>	$\frac{(O - E)^2}{2}$
52	23	841	36.56
42	23	331	15.69
5	23	324	14.08
8	23	225	9.78
8	23	225	9.78

$\sum 85.89$

$$\begin{aligned} \text{Therefore } X^2 &= 85.89_{\text{cal.}} \\ D/F &= 5 - 1 = 4 \text{ at } 0.05 \\ X^2_{\text{tab}} &= 9.48. \end{aligned}$$

#### Decision:

Since the calculated value is higher than table value, we reject the null hypothesis that; the role of Information Communication Technology (ICT) has no significant impact on productivity in the local government administration in Benue State.

#### Hypothesis 2:

There are no significant problems militating against the Application of Information Communication Technology (ICT) in Local Government Administration in Benue State, Nigeria.

**Table 2:** Is Applicable for testing.

O	E	(O - E) <sup>2</sup>	$\frac{(O - E)^2}{2}$
44	23	441	19.17
52	23	841	36.56
4	23	361	15.69
7	23	256	11.13
8	23	225	9.78

$\sum 92.33$

$$\begin{aligned} \text{Therefore } X^2 &= 92.23_{\text{cal.}} \\ D/F &= 5 - 1 = 4 \text{ at } 0.05 \\ X^2_{\text{tab}} &= 9.48_{\text{tab.}} \end{aligned}$$

#### Decision:

Since the calculated value is higher than table value, we reject the null hypothesis that; there are no significant problems militating against the application of Information Communication Technology (ICT) in Local Government Administration in Benue State.

### 1.10. Discussion of Finding

The study has produced startling discoveries as evidenced from the data presentation and analyses. Firstly, it is found that Information and Communication Technology (ICT) have

played a positive role in areas of computerization of Internal Accounting, payroll operations, word processing and Budget planning and administration, job costing, scanning documentation and mapping, decision support, online executive learning/training, urban planning amongst others in the 23 local government areas of Benue State, Nigeria.

This agrees with the view of Adenuga (2003), Ajayi (1995) who in their separate presentations maintained that Information Communication Technology (ICT) have created many new opportunities for Accountants in areas such as information development and information systems design to enhance quality management decision making. It has also facilitated information system management control. This has achieved sustainable competitive advantage. This is due to the fact that Accountants and financial officers of the local government because of their financial skills and objectivity can provide valuable advisory services relating to assessing investments in strategic information technologies, and advising about control system required to meet the needs to management and in most cases the requirements of legislations and regulations.

ICT skills have also enhanced planning in that operators performs appropriate analysis of IT investment, it also resulted to the understanding of areas of risks and benefits. It stimulates and helps manage organizational change and facilitate ability to communicate effectively such that organizational tasks are done accordingly and timely. ICT has also enhanced new administrative reengineering approaches based on effective integration of information technological devices and business processes.

The implication in this regard is that local governments that want to enhance sustainable competitive advantage and have sound control mechanism should earmark reasonable finances to acquire ICT devices such as computers which are the latest models etc in order to remain relevant in their administrative operations on a consistent basis. They need as well to update the skills acquisition status of operators through sound training. All these require proper funding.

Secondly, the study found that there are several problems militating against the application of Information Communication Technology (ICT) in the 23 local government area of Benue State. These problems include lack of technical skills, acquisition of obsolete equipments, erratic power supply, poor technological know how, unreliable telecommunication facilities, ineffective regulatory mechanism by the Nigeria Communication Commissions (NCC), inadequate awareness about ICT applications, and negative attitude of the government through inadequate funding amongst others. This agrees with the view of Sev (2000) who stressed that purchase of wrong and obsolete equipments have also been identified as a big factor constraining the rapid development of ICT. On this note, it is necessary that well skilled professionals be trained to man computerization as well as detect defective parts/installations that are no longer relevant in the system in order to enhance productivity. The implication is that local government administrators need to be transparent and accountable in their affairs in order to obtain good governance. They need to shy away from ugly practices and trends that are counterproductive, such that sustainable competitive advantage will be derived from their operations.

### 1.11. Conclusion

It is pertinent to derive that organizations be it private and public organizations that embrace/adopt information communication technology will attract enormous benefits. These benefits includes; enhanced operational efficiency, improved performance, improved quality of service delivery resulting to customer satisfaction, increase in market share growth and to a greater extent will result to enhanced sustainable competitive advantage.

It is true that local government in the state has primary and secondary schools within their jurisdiction, they have hospitals as well as other key institutions and services. The proper adoption of ICT will facilitate learning in these institutions if these ICT applications are made available to their door steps. For example the installation of ICT centers at local government secretariat, ICT laboratories at each L.G.E.A primary schools to facilitate learning will be a welcome initiative of transformation and catalyst for learning and training in rural areas.

Local government administrators should also endeavour to supply medical computers to their Hospitals to facilitate scanning, x-rays, detection of diseases etc. This will go a long way in repositioning the health status of citizens leaving at the rural areas. It is also important to note that for proper account recording, payroll preparations, secretariat administration, amongst others, computers are to be acquired to enhance operations and proper staff training in their regard to enable them embrace the benefits of globalization in the 21<sup>st</sup> century.

It is therefore important that, problems militating against effective ICT adoption at local government areas be identified so that proper attention be given in addressing such adverse trends. The problems may include; inadequate power supply, inadequate awareness of ICT importance, unreliable telecommunication facilities, negative attitude of the government amongst others. Proper identification of the challenges will leads to an increased likelihood of the identification of remedies for tackling the ugly trends.

### 1.12. Recommendations

1. The Local Government Administrators should made investment in Information and Communication Technology (ICT) a top priority hence it is proven that it is a catalyst/accelerator for development in areas of *education, health, secretariat administration, proper financial record keeping, politics, governance, culture, business and production.*
2. Government should revive the power sector and provide a stable power supply to enable the ICT system/units at the local government areas viable to facilitate optimal functioning. Alternatively, Local government Administrators should make concerted efforts towards acquiring Maikano Generators to be installed at all their ICT centers to facilitate power generation while they wait for Federal government action in this regard.
3. The telecommunication system in Nigeria needs to be completely overhauled or revived (revisited) hence their regulatory body Nigeria Communication Commission (NCC) have not adequately enforced their reforms on the operators. This will pave way for enhance transparency and accountability.
4. Information and Communication Technology (ICT) should be adopted by all the 23 local government of the state. On this note, increase training of employees in ICT utilization should be adequately carried out hence operational efficiency, quality service delivery, sustainable competitive advantage and improved performance will be the outmost benefits to be derived.
5. The Local government of the state should embrace the e-payment systems/transactions in order to enhance accuracy and reliability. Through this transparency and accountability will be derived in their accounting and financial systems of operations. Detection of irregularities and fraudulent acts can easily be made if this mechanism is adopted than the manual payment system in use presently.

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# International Journal of Business & Economic Development

Volume - 3 Number - 1 November 2015

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