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TABLE OF CONTENTS

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Analysis on the Causes and Countermeasures of Sino-US Trade Friction

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ABSTRACT
This study attempts to investigate the causes of Sino-US trade friction in recent years and provides countermeasures accordingly. The import and export volume of two countries, the product structure of China's export, the 337th Act lawsuits related to China, the industries involved in trade friction, and the G-L Index of Sino-US Products are analysed in detail. The causes of Sino-US trade frictions are discussed from the perspective of China and U.S., which include the unreasonable product structures of China's export, poor performance of Chinese enterprises in the trade friction lawsuits, unfavorable condition of China's intellectual property protection, the implementation of trade protectionism by American government, and the demands of American different interest groups. Based on these, countermeasures are put forward. The implementation of industrial upgrading, the increase of the added value of products, and the improvement of intellectual property protection are highly encouraged. Trade friction warning system needs to be constructed in the practice. Chinese government needs to carry out strategic dialogue with U.S.

KEY WORD: Sino-US, Trade Frictions, Trade Protectionism, Grubel-Lloyd Index

INTRODUCTION
China is the largest developing country in the world, and has great market potential. The United States is the most developed country with the highest degree of economic development. China and the United States are important trade partners of each other. In recent years, export becomes the engine of boosting Chinese economy and China runs trade surplus in Sino-US trade. The trade disputes have become fierce between two countries. The friction breaks the smooth process of China's international business communication, and generates negative impacts on the trade relations of two countries. The purpose of this research is to find the causes of trade friction and provide countermeasures accordingly so as to provide China the opportunities to realize present economic and political benefits and the referential experience to solve the trade friction problems with other countries in the future.

LITERATURE REVIEW

Trade friction is discussed by scholars from many aspects.

From the political aspect, there are two views. First, trade friction occurs with political factors. Mancur Olson (2014) supported public choice and developed theory of group behaviour. He discovered that providing benefits were tasks for groups or organisations, if there were large amount of members in an organisation, the much more difficulties organisers would face when achieving deals. Charles W.L.Hill (2016) pointed that in some anti-dumping lawsuits, governors would set policies which were beneficial for labour unions because officials considered their votes. The second point mentions strategic conversation in order to reduce trade friction. Zachary Karabell (2010) thought there would be more uncertainties in future trade under complex world pattern, and trade frictions should be under control. Christopher Layne (2012) pointed that the trade friction was unavoidable and these countries could minimize loss by strategic dialogues. Shuai Jianlin (2013) developed Dependence Theory and found importance of settling relationship between political and economical systems.

Many researches investigated the trade dispute from the intellectual property aspect. Hernando de Soto (2012) found that the majority of countries gained less benefit before copyright protection, and recent trade disputes were mostly concerned with protecting intellectual properties. Wang Qiang (2013) said the punishment scope of intellectual property became wider. Wang Min & Tian Ze (2014) explains the meaning of 337th Act and punishment consequences by 337th investigations. Jiang Yonghong & Yu Chengcheng (2015) said the 337th investigations adjust the focus from China's raw material industry to electronic field.

Scholars also analysed trade friction from mercantilism and trade protectionism aspects. Yuan Chi (2012) proposed some advice to deal with mercantilism like product innovation. Douglas Irwin (2012) discovered there was economic downturn worldly in post-crisis era, and trade protectionism gradually rooted in commercial environments. Ronald .I. McKinnon (2013) described American situation and he said under trade imbalance, the U.S. would put trade protectionism into practice. P.R. Krugman (2014) identified the 'New Mercantilism' that a country protect domestic production, main actions included encouraging export and limiting import.

From the intra-industry trade aspect, Balassa (1966) said the adjustment cost could be calculated based on intra-industry trade index. Grubel & Lloyd (1975) explained G-L index was one of 'Intra-Industry Trade' measurements. Wan Zhaoquan (2013) introduced how the intra-industry trade influenced the trade friction.

From the product structure aspect, P.R. Krugman (2013) suggested that production expansion was the first way to form competitive market, lowering production costs and improving products' add value could improve exporter's competitiveness. Liu Hong (2013) summarised that China's advantageous industry was labour intensive, and higher quality of technological goods should be provided in markets.

These researches discussed the trade friction from different aspects, however, the comprehensive solution for China to solve the trade friction problem with U.S. was seldom found. Therefore, that becomes the purpose of this research.

DATA AND METHODOLOGY

Index comparison, case study, and correlation analysis are used in this research.

Sino-U.S. Import and Export Volume

Comparison in import and export results in trade surplus and deficit. Trade imbalance is one of the key reasons of trade friction. In table 1, it can be seen that the trade volume increases greatly before 2011, but increase slowly after 2011. The increasing numbers reflects China maintains trade surplus in these years. It can be explained by labor-intensive advantages and processing deals. The continuing trade surplus has brought the U.S. much concern and makes American government to limit importing Chinese products and approve economic recovery plans.

Table 1. Import and Export Volume between China and U.S. in 2010-2014
Unit: hundred million USD

	YEARS				
	2010	2011	2012	2013	2014
Trade volume	29727	36419	38668	41603	43030
Compared with last year（%）	29.2	16.0	8.5	7.5	3.4
Importing	13948	17433	18178	19503	19603
Compared with last year（%）	31.7	20.0	8.8	7.2	0.4
Exporting	15779	18985	20490	22100	23427
Compared with last year（%）	28.3	15.0	8.4	7.8	6.1
Chinese trade plus	1831	1552	2312	2597	3824
Compared with last year（%）	26.5	12.0	8.2	12.3	47.2

Source: www.mofcom.gov.cn

Product Structure of China's Export to U.S.

Table 2 shows the main product structure of China's export to U.S. It reflects the industry orientation and favourable fields of China's export. The most appealing exporting goods are mechanical and electronic products, furniture and toys, which are labour-intensive products. These data provide reference for China improving export product structures.

Table 2. Product Structure of China's Export to U.S. in 2007-2014
Unit: hundred million USD

	YEARS							
	2007	2008	2009	2010	2011	2012	2013	2014
Mechanical and electronic products	140745	145495	135368	173354	193547	209830	217980	232340
Furniture, toys and others	48304	48457	40916	46950	45214	46800	48290	50746
Textile	31185	31489	30896	37030	39261	39290	40670	41183
Light industrial goods	20791	24090	15664	18786	20090	11168	11890	20228
Base metal goods	16796	17151	15374	17436	19792	21130	21700	24234
Total	257821	266682	238218	293556	317904	328218	340530	368731

Source: www. mofcom.gov.cn

The 337th Investigation

The 337th investigation focuses on the unfair competition and trade behaviors. Once companies receive the 337th investigation, they are facing strict sanction. Figure 1 depicts American 337th lawsuit index within 10 years. It clearly shows the trends of the 337th investigation exerting on China and other countries. In 2010, the number of 337th investigation received by China

peaked at 26, which took up nearly 40% of the total volume. It means 337th investigation gradually becomes the American main practice of protecting domestic industries and punishing China.
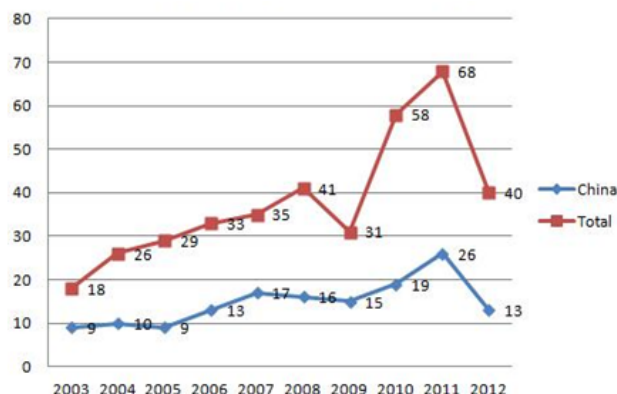
Figure 1. The 337th Investigations Aiming at China and the World
Unit: case
Source: cacs.gov.cn

Industries Involved in Trade Friction

At the end of 2009, Obama introduced reindustrialise strategy to encourage technological innovation and emerging companies' development. The U.S. starts to cultivate advanced manufacture such as new energy and biological technology. Under reindustrialise policy, the U.S. aggravates trade friction with China. Table 3 displays China's main industries suffered from 337th rules investigation. It indicates that the U.S. decreases the 337th investigation in chemical and foods fields, and pays much more attention to electronic industries and machine industry. In addition, it also explains that with the development of China's industry, more industries are suffered, such as cars and metal products.

Table 3. China's Industries Involved in the 337th investigations in 1998-2013
Unit: case

	YEARS			
	1998-2003	2004-2008	2009-2013	Total
Electronic industry	6	31	60	97
Machine	6	11	19	36
Light industry	6	14	14	34
Chemicals	2	5	2	9
Medicine	1	0	4	5
Cars	0	0	2	2
Metal products	0	0	2	2
Metallurgy	1	0	1	2
Food	0	2	0	2
Building materials	0	1	0	1

Source: cacs.gov.cn

Correlation Analysis in Intra-industry Trade and Trade Friction

According to Balassa's smooth adjustment hypothesis, an industry type decides adjustment cost. The cost degree can be figured out by intra-industry trade index. To get the data of intra-industry trade index, G-L exponent is used in this research. Grubel-Lloyd (abbreviated as G-L)

exponent is created by economist Grubel and Lloyd in 1975, it is the common calculation of intra-industry trade index. The formula is as following:

$$GL_i = \frac{(X_i+M_i)- \mid X_i-M_i \mid}{X_i+M_i} \times 100\% \text{ also equals to: } 1-\frac{\mid X_i-M_i \mid}{X_i+M_i}$$

i represents industry type; X_i is the exporting data while M_i is the importing number concerning this industry. GL_i calculated later is the intra-industry trade.

G-L result ranges from 0 to 1 and has positive correlation with intra-industry trade. When the index is approaching 0, it indicates that the degree of trade of the commodity is low. When the index is approaching 1, it indicates that the degree of trade of the commodity is high. There will be obvious intra-industry trade when the index is bigger than 0.5.

Table 4. G-L Index of Sino-U.S. Products in 2003-2013

SITC1(section)	*YEAR*										
CODE	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
5	0.98	0.96	0.95	0.94	0.97	0.90	0.95	0.95	0.99	0.94	0.88
6	0.20	0.17	0.18	0.17	0.17	0.19	0.22	0.22	0.21	0.21	0.21
7	0.33	0.29	0.28	0.31	0.32	0.31	0.25	0.26	0.25	0.23	0.18
8	0.05	0.06	0.06	0.07	0.06	0.07	0.08	0.09	0.10	0.11	0.12
Total	0.22	0.21	0.21	0.23	0.24	0.24	0.23	0.25	0.25	0.23	0.23

Source: www.comtrade.un.org

In international trade statistics, commodities are classified according to SITC (Standard of International Trade Classification) in the United Union. SITC is a statistical classification of the commodities entering external trade. It is designed to provide the commodity aggregates requited for purposes of economic analysis and to facilitate the international comparison of trade-by-commodity data. The hierarchical structure of the classification comprises sections, divisions, groups, subgroups and items. SITC1 is based on section. According to SITC1, code 5 represents chemicals and related products. Code 6 represents manufactured goods classified chiefly by material. Code 7 represents machinery and transport equipment. Code 8 represents miscellaneous manufactured articles. As indicated in Table 4, the G-L index of commodities under Code 6, 7, 8 are less than 0.5, which means the upgrading of these industries will bring greater adjustment cost.

RESULTS AND ANALYSIS
Based on these observations and findings above, the causes of trade friction from the aspect of China and United States are explored.

The Causes from the Perspective of China
Unreasonable Structure of Export Products
Commodities are essential part in international trade. There are some defects in the structure

of China's export products. Most China's export products, such as textile and mechanical goods, are labor-intensive products. Due to the labor cost advantage in China, the prices of these products are lower than American products. American government regards this competitive pricing behavior as dumping to occupy market share, therefore, policies are approved to restrict the import from China.

According to Table 4, commodities under code 6 and code 8 are associated with labour resource and raw materials. Products lack added value and advantages to compete with American goods. Product differentiation and diversification cannot be achieved. And the majority of firms are contract manufacture or original design manufacturer. They do not have their own brands. Moreover, these two types need to effect much adjustment in the process of industrial adaption. New labor resource decreases when China enters aging society. Middle-aged groups become the main source of labor. In addition, domestic textile industry is well treated in the U.S., which is in the large demand of labor. The growth of Chinese textile export to America causes protests from American workers.

Poor Performance of Chinese Enterprises in the Trade Friction Lawsuits

Facing trade disputes, especially 337th investigation, Chinese companies lack capability of gathering information and making strategic analysis of situation. They always fall behind in solving trade disputes. Some managers do not realise foreign enterprises spend much time and energy on patent protection. On one hand, some Chinese enterprises dos not figure out why anti-dumping investigations happen. They rarely respond in legal ways when they are accused. The lack of prompt reaction and handling ability bring Chinese enterprises disadvantageous circumstance and large amount of costs. On the other hand, the trial period of anti-dumping, 337th Act is comparatively long. Many small companies think it is waste of time and money, so they are not willing to make quick response to accusation. As for some new industries, their financial status cannot provide a reliable source of information. Their vigorous attitudes towards trade dispute are easy for judges to agree with American statement and this inactive behaviour will impel the U.S. to propose stricter lawsuits.

Unfavorable Condition of China's Intellectual Property Protection

Another reason to the increase of trade friction lawsuits is the intellectual property protection. The intellectual property protection system is not well established in China. Business men may not be able to implement law protection although they know exactly the contents of intellectual property. Moreover, according to the Patent Law of China, the applying period of patents is comparatively long, compared with other foreign countries. It increases the difficulties for intellectual property protection.

The U.S. has great recognition of intellectual property and regards it as an instrument to accelerate the development of economy. In 8th October 2012, the U.S. Congress published a report that Hua Wei Company and ZTE Corporation provide opportunities of obstacle American internet communications. This report also advised firms to reduce cooperation with these two Chinese companies in case intellectual property was suffered. Some similar cases prevent Chinese products from export in terms of brand image and technological copyrights.

The Causes from the Perspective of U.S.

Trade Protectionism

New mercantilism promotes fair trade instead of free trade. Paul Krugman and many economists summarize trade protectionism as new mercantilism. They emphasize the international competiveness can be increased through government interference. After

economic recession in 2008, trade protectionism was generated under negative trends towards American development. The American government started NEI (National Export Initiative) to promote export and limit import from other countries. Given continuous trade deficit with China, the non-tariff trade barriers are widely strengthened, especially the implementing of intellectual property protection and anti-dumping laws. The 337th investigation is a typical example.

Interest Groups

According to Group Theory, organizations formed by individuals or enterprises are usually on the way of same interests. Interest groups play important roles in American politic and economic affairs. These groups interfere with foreign policies upon authorities and financial rights. When Chinese cargos enter American markets, group members will burden government and ask officials to restrict trade with China. In 2009, Obama signed Special Protection on Tire and restricted the Chinese tire to enter markets. The fundamental reason lies in United Steelworkers Union. They complained that Chinese tires occupied too much market share, which cause big domestic industrial loss and increase unemployment ratio. In order to transfer social dilemma and guarantee stable political environment, Obama approved this trade policy and then implement more restricted tariff rules.

In the U.S., the president election is not based on whether he or she can achieve real national benefits, but the political and economic opinions in the speeches. Candidates will express their trade policies to convince more interest groups so that they can own plenty of campaign funds. So in reality, the president elections become the fight among interest groups serving in different fields. This year is unforgettable due to American election. With the victory of Trump, American people pay more attention to trends of government policies and foreign trade. In election speech, Trump ambiguously considers China as exchange ratio manipulator because of the particular level of CNY ratio and China's trade competiveness.

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CONCLUSIONS AND RECOMMENDATIONS

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The reasons for Sino-U.S. trade friction include the inappropriate product structures of China's export, poor performance of Chinese enterprises in the trade friction lawsuits, unfavorable condition of China's intellectual property protection, the implementation of trade protectionism by American government, and the demands of American different interest groups.

Implementing Industrial Upgrading

To solve the problem of trade imbalance in the long run, China needs to upgrade its status of participating in international division of labour. As the main force to promote the economic development of China, China's traditional industries (textile industry, manufacturing industry etc.) take up large proportion in the national economy. It is wise to optimize the resource allocation of other industries provided the steady development of traditional industries. According to table 4, the upgrading of industries related to code 6, 7, 8, will bring greater adjustment cost. Therefore, in the implementation of industrial structure adjustment, appropriate practices need to be implemented according to the characteristics of different industries, so as to protect the welfare of workers and reduce the unemployment rate.

Increasing the Added Value of Products

China should not be only satisfied with the production of low-cost labour-intensive products, but need to produce high technical content and high value-added products. The technological innovation can help enterprises to acquire competitiveness in the world market, which requires enterprises to analyse the market trend continuously, and introduce customized

products accordingly. With the increase of the investment in high value-added products, the investment in products with large resource consumption should decrease.

In the process of production, there is a certain gap between China and U.S. in terms of technology level. Chinese enterprises should make reasonable evaluation and allocation of production factors, implement technological transformation, enhance production efficiency, and improve product quality.

Improving Intellectual Property Protection

Chinese enterprises should respect other countries' patents and brands, and improve the awareness of intellectual property rights. Under the existing intellectual property protection circumstance, enterprises should also speed up the research and development of self-owned brand, make innovation and apply patents, in response to the increasing competitive pressure brought by other countries. When facing intellectual property disputes, enterprises should change the reluctant attitude towards lawsuits and actively study intellectual property laws at home and abroad in order to protect their legitimate rights and interests.

Building Trade Friction Warning System

Many companies do not realise they are in the dangerous of accusation until the loss is sustained. As a result, trade friction prediction system is essential for government to collaborate with firms and industry associations. First, Chinese government should set up coordination institution and build strong information exchange system among customs, Ministry of Commerce, State Administration of Quality Supervision, Inspection and Quarantine, and foreign trade enterprises. These institutions and enterprises share information and monitor the symptom of trade dispute in time. The convenient information exchange can help Chinese enterprises come up with solution plans for trade disputes. Second, Chinese government can gather the information of all cases related to trade frictions launched by the U.S., and study whether WTO regulations apply to these cases. With the help of government, enterprises can make full preparation of trade friction lawsuits and have better performance in the process of litigation.

Carrying out Strategic Dialogue and International Negotiation

Interdependence Theory focuses on international relation in political economy. Zachary Karabell points that the way China and the U.S. dealing with each other will have impacts on global economy. Sino-U.S. trade strategic mechanism has become more and more mature after several years of operation, the Strategic Dialogue (SD)and Strategic Economic Dialogue (SED) has become an important role in coordinating the development of the country and maintaining the national core interests. China and America need to share ideas both parties concern and discuss future of bilateral trade relations. China and the U.S. should explore mutual interests, share common views, and decease the trade disputes. In addition, after Trump wins, the discussion of the economy future is cared by most American and Chinese people, such as economy trends in post-crisis period and potential transformation of economy. To strengthen international relations, China needs a better understanding of Trump's positions and makes good preparation for the possible consequences.

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Compensation and Employee Loyalty Among Health Workers In Nigeria

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ABSTRACT

Compensation and employee loyalty has been an issue of great concern in organizations over the years. This problem prevails in the contemporary society especially in Nigeria. It therefore becomes imperative to investigate and determine the influence of compensation on employee loyalty. The research was a survey of eight private hospitals that were purposively selected in Port Harcourt. To carry out this research, relevant literature was reviewed to confirm the existence of the problem. The components of the independent and dependent variables were examined. Questionnaire was the major instrument that was used to collect data for the study. The study sample size was determined using Taro Yamen's formula and Spearman Rank Order correlation coefficient was used to analyse the data. It was found that there is significant positive relationship between compensation and employee loyalty. It was recommended among others that regular payment of employees salary will impact positively on the cognitive loyalty of the employees. Increment of employee salary enhances positive reactions of the employees thereby inducing loyalty. Organizations should encourage the employees to own shares as it induces cognitive loyaltyamong workers. Equity based compensation influences employee behaviour positively thereby encouraging retention of employees. Organisations should consider occupational hazards of hospital environment when fixing the pay of the employees.

Keywords: Equity, Cognitive Loyalty, Behavioural Loyalty, Pay, Equity-based Compensation, Organizational Climate

INTRODUCTION

Today's business environment is characterized with competition, economic instability and turbulent changes in technology both at local and global level. The phenomenon of employee loyalty is on the increase in the recent time and it has become top priority in most organizations. This is as a result of its relevance not only in Nigeria but in the wider society. Most organizations do not want to lose their employees to rivals especially well talented and highly skilled employees. As a management concept, employee loyalty has attracted significant attention from many scholars who have researched on it from different backgrounds, (Rishipal& Manish 2013).

Employee loyalty is imperative for organizational survival and prosperity. Researchers have demonstrated that faithful workers display abnormal state of emotional sense of duty regarding organizational success. Steadfast workers can be exceptionally significant advantages for the organizations as they can pick up as much benefits for the organizations. This is on account that steadfast workers will deal with clients in the correct manner and they comprehend what clients need and convey it. (Michlitsch 2000). The genuine achievement of an organization begins from workers readiness to utilize their innovative capacity and know-

how for the organization and it is the organizations assignment to support and medical attendant this positive employees contribution by setting up viable reward rehearse, (Markorva& Ford, 2011).

Today, healthcare organizations are tested by the absence of responsibility from nurses and doctors because of their decisions to leave the organization (Essono&Sandeep 2016). Employee turnover can emerge accordingly disappointment at work, poor workplace and troublesome reward framework. At the point when the framework is no longer ideal to the employees, their loyalty starts to decay, negative work state of mind sets in, poor execution and at times prompts renunciation. This influences the efficiency, gainfulness and achievement of the organization. In this way any organization that needs to survive must set up an exceptionally viable reward framework, a standard pay structure and enhanced work approaches that are fit for improving worker viability and duty. Remuneration as a section of move between the worker and the proprietor that the results employee contract. As the forthcoming of employee, pay is the need of life. The payment gotten from work done in the business (Hameed, Ramzan, Zubair, Ali, &Arslan, 2014).Organizations cannot manage without pay framework in light of the fact that the entire idea of work visitors on payment. It is a solid propelling element which upgrades or pushes execution. Pay as put by Upasana (2015) implies the places of pay level the extent that position or bent, underlining the places of compensation, the refinement and the standard of rank complexity. This calls for auditing of the agents as demonstrated by their level and capacities.

An aspect of management it can be depicted as the measure of reward that an expert foresees from the business. Delegates should be content with centered pay packs and they should be content with it while differentiating their remuneration bundles and those of the untouchables who are working in a comparable industry. A conclusion satisfaction is felt by accomplishing sensible and fair prizes (Alam, Rafat&Puja, 2012). Compensate framework is one of the essential issues in each organization,if not well tailored and appropriately tended to, it can prompt debate, specialists distress or loses in the organization.

The subject of pay and Employee loyalty has dependably been a center administration issue in Nigeria as well as in more extensive society. This is available in all divisions of the economy both government parastatals and private area. The concentrate of this exploration is on remuneration as connected among healthworkers in Rivers State, Nigeria. The compensation framework is an exceptionally solid determinant in hierarchical execution. Martochio (2001) saw it as one part of a human asset framework and it is characterized as the prizes (fiscal and non-financial) that workers get for playing out their employments. It is a delicate segment of each administration.

Statement of the Problem
The loyalty and compliance of employees at work place is very important as it is the brain behind organizational survival. But the issue is that most employees seem not to be loyal to their companies. Research has shown that most organizations have record of theft, fraud, negative work attitude, absenteeism, strike and all forms of unethical behaviour. According toEssono and Sandeep (2016) attention to that the achievement of any organization starts from the eagerness of the employees to utilize their innovative capacities for the organization.

Compensation is a very vital element in human resources. It has direct bearing with performance, loyalty and environment. In the work of Cole (2005), he argued that the most important obligation owed by an employer to a worker is to pay him or her wages. The fulfillment of this duty involves most employers in the biggest expense of their business. In this

circumstance therefore, it is not surprising that most organizations both private and public sector spend a good deal of time and effort in devising appropriate payment systems to meet all these various pressures.

Compensation is a fundamental issue in every organization because it boarders basically on the payment of the employees. It is viewed as a crucial segment of the human resource because of its sensitivity, it is pure employee matter and as such most organizations handles it with pinch of caution. It is in this line that Nanta*et al.,* (2010) argued that organizations both public and private design compensation packages and strategies to increase employees job satisfaction and job performance.

Nevertheless, despite the seemingly high premium of compensation, most organizations still record high labour turn over especially in the focused area of this research, the health sector. The major issues regarding local or international private organizations have increasingly high rate of staff turnover and the ineffective performance caused by various issues such as poor salary, complex environment, ambiguous duties, job insecurity and most importantly few orientation as well as required on the off job trainings desirable to execute the take efficiently (Batool&Batool 2012). Most work organizations especially in the health sector which is the focus area of this study should probably identify compensation as the key component of effective organization. It is necessary to carry out this study to investigate compensation as it applies in organizations. Hence, supporting those individuals who are loyal and committed will strengthen the bond between the organization and employees (Fischer, 2013).

This study is set to investigate the basic issues that borders on compensation as it affects employee loyalty in work organization especially the health sector in Rivers State, Nigeria.

Conceptual Framework
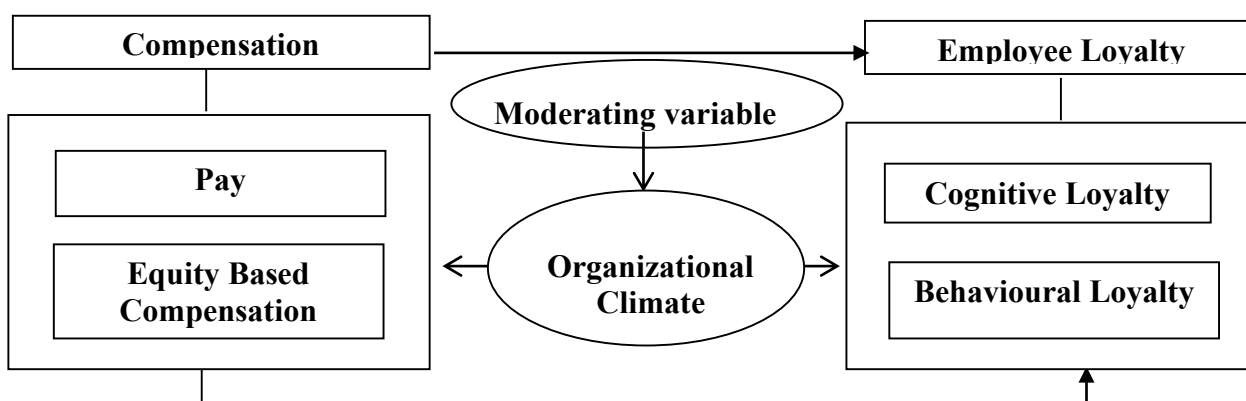
Fig. 1: Conceptual Framework showing the relationship between compensation and employee loyalty.

The dimensions for compensation are pay and equity based compensation (Stock) option were adapted from Aswath (2005). The measures for employee loyalty are cognitive and behavioural loyalty were adapted from Mohammed &Mahsa (2015).

Objectives of the Study
In specific terms, this study objective is as follows:
  i.   To examine the relationship-between pay and cognitive loyalty of health workers in Rivers State, Nigeria, Nigeria.

ii.   To examine the relationship-between pay and behavioural loyalty of health workers in Rivers State, Nigeria.
iii. To examine the relationship-between equity based compensation (stock) and cognitive loyalty of health workers in Rivers State, Nigeria.
iv.   To examine the relationship-between equity based compensation (stock) and behavioural loyalty of health workers in Rivers State, Nigeria.
v.   To determine how organizational climate moderate the relationship between compensation and employee loyalty of health workers in Rivers State, Nigeria.

Research Hypotheses
The study hypotheses are:

Ho$_1$ There is no significant-relationship between pay and cognitive loyalty of health workers in Rivers State, Nigeria.

Ho$_2$ There is no significant-relationship between pay and behavioural loyalty of health workers in Rivers State, Nigeria.

Ho$_3$ There is no significant-relationship between equity based compensation (stock) and cognitive loyalty of health workers in Rivers State, Nigeria.

Ho$_4$ There is no significant-relationship between equity based compensation (stock) and behavioural loyalty among health workers in Rivers State, Nigeria.

Ho$_5$ Organisational climate does not significantly moderate the relationship between compensation and employee loyalty of health workers in Rivers State, Nigeria.

Scope of the Study
It explains the coverage of the study in terms of content scope, geographical scope and unit of analysis.

Content Scope:
The knowledge was restricted to literature in compensation, employee loyalty, pay, equity based compensation, cognitive loyalty, behavioural loyalty and organisational climate.

Geographical Scope:
The study was conducted in Rivers State, Nigeria.

Unit of Analysis: The unit of analysis is micro and that is based on individual level.

LITERATURE REVIEW
Theoretical Framework
The theoretical foundation of this study is the theory of equity in compensation. The theory of equity in compensation has attracted much attention over decades ago. Equity theory was first propounded by John Stacy Adams in 1963. He argues that an employee is mainly concerned with whether his benefit or reward (pay) is equal to his level of input or effort at work, Adams (1963). The emphasis is on determining whether the distribution of resources is fair to the partners involved.

Equity theory point that an individual's motivation is affected by how he or she perceives inputs (i.e. work performance to outcomes (i.e. rewards) in relation to referent others. Consequently, from a motivational perspective, the organization must provide rewards that are proportionate to individual inputs. (Gomez-Mejia, Berrone& Franco-Santos 2010). Equity theory depends on the recommendation that individuals make judgements about the reasonableness of their compensation on a near premise. Individuals in a similar occupation part, doing comparative work under a compensation movement framework dictated by issues,

for example, legitimacy or examination, will make an evaluation with respect to regardless of whether the exertion remunerate results are reasonable (Thompson, 2000).

As indicated by Heinz, Mark and Koontz (2011), equity theory focuses on whether people see the reward as being reasonable or about the reasonableness of the reward he or she gets, in respect to the data sources which incorporates many variables, for example, exertion, experience and training in correlation with the prizes of others. The idea of equity theory is focusing on how workers feel about pay in a specific organization contrasted with that of their partners in different organizations. They look at their commitments which constitute inputs and the yields the benefit and relate it to their compensation. The tenate of equity theory is that the compensation of aemployee ought to be equivalent to his commitment to the organization. Adams (1963) in his work on Toward an Understanding of Inequity he called attention to that worker view of what they add to the organization, what they receive consequently and how their arrival commitment proportion thinks about to other inside and outside the organization decides how reasonable they see their business.

This theory holds the view that when employees watch a few components or measures of disparity in their compensation framework, they will surely attempt to right it, this is the thing that prompts work agitation in both work services and corporate organizations. It is toward this path that Redmond (2010) contends that equity theory recommends that a man's inspiration depends on what he or she considers to be reasonable when contrasted with others.

Gogia (2010) called attention to that equity theory concentrates on anemployee's work remuneration relationship or trade relationship and additionally that of employees endeavor to limit any feeling of injustice that may come about. Equity idea is investigated by numerous researchers as a fundamental instrument of inspiration which has solid impact in employee execution. At the point when employees are not generously compensated contrasted with their information, the propensity is that they will see it as disparity and obviously battle to re-establishequity. They can choose to go on strike or start to demonstrate non-challant state of mind towards their occupation or working with irritation. This obviously will influence the perfeormance of the organization.

Equity theory gives a helpful guide as remuneration capacity. It can be connected in any trade circumstance, so there are large numbers of parts that can be recorded as information sources or yields (Redmond 2015). As Geshart, Minkoff& Olsen (1995) put it that Equity theory is likewise pertinent in light of the fact that it can be connected to pretty much any compensation choice since decency is dependably a key concern.

Compensation

In every business organization, the pay system is always a crucial issue. This is probably because it is seen as strong determinant of employee loyalty and performance. As a management concept, compensation can be described as the core of any employment exchange and it serves as a defining characteristic of any employment relationship (Glassman, Champagne &Zugelder 2010).Compensation does not exist in a vacuum. At a very basic level an organisation's compensation system reflects a reasoned strategy in the part of organization is going to compete within a competitive and constantly changing workplace (Maloa 2011).

Agwu (2013) brought up that the central reward for performing work is pay, numerous businesses likewise offer reward bundles of which wages and pay rates are just a section. The

bundles commonly incorporate rewards, benefits, plans, medical coverage, distributed autos, helpful advances financed dinners, benefit sharing, share choices, and so forth. Upasana (2015) defined compensation as the stages of position or skill. Studies have shown that compensation structure also includes grading of the employees according to their qualifications and functions. It is expected that the salary and allowances will certainly differ. There are some key points that require consideration.

Table 1: Compensation Structure

1	Pay structure	Job performance	Ability to perform
2	Employer's focus	Job carries wages, link to job.	Employee carries wages,
3	Employee focus	Job promotion to earn greater pay	Skill acquisition to earn greater pay.
4	Procedure required	Access job content; equity job.	Access skills; equity skills.

Adapted from: Upasana (2015)

Pay Compensation
One of the pay compensation is traditional method of remuneration. It is the oldest system of exchange. No organization can survive without remuneration of the human resources. The primary need for work is pay. It is in this light Geshart, Minkoff& Olsen (1995), contended that employees ordinarily rely on upon wages, pay rates to give an expansive offer of their salary and on advantages to give wage and health security. The essence of this compensation is to empower the workers meet their day by day needs. Keeping in mind the end goal to pick up accomplishment in getting and holding a strong work compel, business as are centering their exertion more towards addressing the requirements of desire of their employees (Acrue partners, 2016). Organizations contrast in strategies, approach and administration style. As indicated by Geshart, Minkoff& Olsen (1995), they propelled that compensation rehearses shift essentially crosswise over utilizing units and to some degree, crosswise over occupations. Sometimes, the nature of the occupation decides the compensation, in the work of Mechmood (2013), he called attention to that prizes assume crucial part in expanding employee rewards and change the conduct of disappointed workers.

Equity Based Compensation (Stock) Option
Everywhere throughout the world, the conventional instrument of reward framework is cash payment. Be that as it may, in the current decades consideration has moved to equity based compensation particularly among present day organizations. There is presently acknowledged that enhancing executives' long termincentives is attractive (Lucian &Yesse 2010).

Equity based compensation has turned into a greater piece of general worker pay. As of late, many firms have moved towards equity based pay for their workers. It is normal for firms to give a large number of alternatives every year to top directors as well as to lower level chiefs (Aswath 2005).

Most contemporary organizations embrace the act of equity based compensation and for the most part investment opportunity as a result of its advantages. Owning stocks in the organizations can make the workers to have that sentiment possession which at last forms into organizational citizenship conduct (OCB). Most organizations make equity based compensation beat need as it helps organizations to accomplish the level of corporate administration and accomplish organizational goals.

Current organizations and in addition the healthsector embrace the act of equity based pay and incorporate it with their compensation structure particularly the investment opportunity on account of the conspicuous advantages. As indicated by Aswalth (2005), offering equity in the firm to supervisors may decrease the office issue by making administrators think more like stockholders as most equity pay accompanies a necessity that the worker remain with the firm for a timeframe (the resting time frames) to make a case for the remuneration. Workers who get choices or limited stock as remuneration are in this way more prone to remain with a firm.

This arrangement of payment supports maintenance and employee unwaveringness among the workers. Equity motivating forces and stock based pay are vital components of the contracting condition amongst shareholders and administrators (John, Guay& David 2003). In stock based compensation the workers are being remunerated with loads of the organization. In this arrangement of remuneration, the stock turns into the instrument of payment. Stock however can be alluded to as an offer in the responsibility for organization. Stock speaks to a claim on the organization's benefits and income. The more an official gets more stock, in his in the organization increments (John, Guay& David, 2003). It is a method for empowering the workers and compensating their execution in the organization through that solid instrument of compensation.

Employee Loyalty
The idea of employee loyalty has dependably been a pivotal issue in each work put. Organizations that comprehend management standards and values dependably endeavor to guarantee employee faithfulness in the organization. Hooi (2013) sees employee loyalty as a mental connection or a pledge to the organization and creates increasedfulfillment. Fulfillment comes about because of a procedure of interior assessment and if a worker's desire level is met or surpassed, then fulfillment develops. Employee dedication then forms into a summed up passionate demeanour towards the organization. At the end of the day, the more fulfilled a employee is with respect to his or her workplace, the more probable that he or she will build up a feeling of responsibility towards the organization when all is said in done.

The effect of qualities, objectives and goals of the organization on Employee loyaltycanbe very surprising. Most employees incline toward an inviting workplace to extensive administration. In this way loyalty is portrayed by the solid wish to proceed with participation of an organizationwhich assumes a positive part in maintenance of individuals in the organization Becker, Donna &Riegel (1995).

Cognitive Loyalty
Cognitive loyalty is an important aspect of employee loyalty. It is the first stage in the loyalty model of management (Mohammed &Mahsa, 2015). It is another aspect of loyalty identified in more recent years which viewed loyalty as a higherlevel dimension and involves the employees' conscious decision making process in the evaluation of alternatives (Caruana 2002). Under cognitive loyalty, employees are rational in their belief and logical in their decisions. Their loyalty is based on what they will gain. Employees are conscious of their input in the organizations and compare it with their pay. They try to find out if their pay is commensurate to their input (Ndanusa, Harada, Romle& Abdul 2015).

As a component of loyalty, employees with cognitive loyalty can easily shift their service to another company. This occurs when there is an organization that can give them a better offer. This is because under cognitive loyalty, there is no deep loyalty to the organization, too much attachment or allegiance. It is in this direction that Kalyanaram, Gurumurthy, John& Little

(1994) argued that most employees are born to switch to another organization once they perceive alternative offerings which are more beneficial.

Behavioural Loyalty
The loyalty of the employees is always uppermost to the employer. Every organization strives to make employees are loyal. Maznah, Yusoff&Hussin (2010) asserted that it has become top priority in most organizations because of its immense positive impact towards organizational survival. Noah & Steve, (2012) asserted that it makes sense to study and know about attitudes because strong attitudes will very likely affect a person's behaviour.

According to Noe, Hollenbeck, Geshart& Wright (2006) the competitive business environment has triggered significant attention of many researchers in the area of behavioural loyalty. The human resource management of most organizations are thinking of the strategies, practices and frameworks that impact employees conduct, states of mind and execution. As indicated by Geise and Cote (1999) fulfillment can either be a behavioral or psychological reaction relying upon the specific circumstance. As a social being, employee cannot easily be predicted. Organizations that are not sensitive about the behavioural component might experience labour unrest.

Organizational Climate
Organizational climate portrays how employees see specific attributes of their utilizing organization which incorporates authority style, correspondence level and the workers' cooperation in the basic leadership (Essono&Sandeep, 2016). It alludes to the essential segments inside the organization which fundamentally affect the workers.

Adenike (2011) propelled that hierarchical climate involves related arrangements of states of mind, values and practices that describe the individuals from a specific organization.

In this review, the organizational climate under survey is health sector in Rivers State, Nigeria Healthcare where specialists which is thought to be most perilous work related settings, (Moore &Karmerel 1990).

Most organizations including the health sector expect high level of loyalty and committed from their employees. Employees on the other hand expect the enabling environment and conditions that can guarantee satisfaction to make them deliver quality services. But most health organizations play down on this. The health risks prevalence at workplace are sufficient reasons that necessitates constant demand for improved remunerations, adequate provisions of safety materials to protect the health worker and favourable policies and safety laws. The life and safety of the health worker should be given top priority.

Relationship between Compensation and Employee Loyalty
Compensation portrays payment of the employees by the organization for the service rendered. Remuneration is the center of each work trade and it fills in as a characterizing normal for any business relationship (Glassman, Champagne &Zugelder 2010). The issue of remuneration is one of the fundamental parts of business that an organization must settle before getting the employees. The primary reward for performing work is pay, numerous businesses additionally offer reward bundles of which wages and pay rates are just a section. The bundles ordinarily incorporate rewards annuity plans, advances, sponsored dinners benefit sharing, medical coverage, allotted autos, share alternatives and a great deal more (Agwu 2013).

Remuneration ought to be outlined remembering the way of the occupation and all that is included so that sufficient arrangements can be made. Employees regularly rely on upon wages, pay rates to give a vast offer of their salary and advantages to give pay and health security (Geshart, Minkoff& Olsen 1995).

Clearly the outline of the pay decides the work state of mind of the employees which has a considerable measure to do with loyalty. At the point when the remuneration is not great, it results to poor work state of mind and work turn over. Today's social insurance organizations are tested by the absence of duty from medical attendants and specialists because of their decision to leave the organization (Essono&Sandeep 2016).

The main non-monetary parameter that influences worker loyalty is job satisfaction. Work satisfaction is a mind boggling state of mind which includes certain suspicions and convictions about the occupation (a psychological part), sentiments towards work (a full of feeling segment) and the work appraisal, (an assessment segment). A fulfilled specialist is a beneficial labourer and the organization's prosperity cannot be accomplished having disappointed workers (Igor, Buntak&Ivana, 2015). The relationship is that of tit for tat. Williams et. al., (2007) declared that if employees are happy with how the organization works and imparts its remuneration arrangements, they stay focused on the organization. Organization's reward framework can influence the execution of the employee and their yearning to stay utilized (Bamberger &Meshouam 2000).

At the point when a company receives an arrangement of reward that is useful to the workers, the impact is that the employee end up noticeably faithful and furthermore builds their level of duty consequently guaranteeing high efficiency and productivity. On the other hand, whereby the pay is not good to the person, the inverse is the situation; the organization starts to witness negative work state of mind, truancy, robbery, dillydallying, extortion, acquiescence, and so forth. No big surprise (Gomez-Mejia, Berrone, and Franco-Santos 2010) declared that when execution is utilized as a reason for disseminating rewards, payment is accommodated individual or gathering commitments to the firm. Remuneration conveys payment for the yield or result and most intently looks like the operation of conventional piece-rate arrangements or deals commissions. As indicated by Bevelacqua& Singh (2009), pay-for-execution frameworks are as often as possible utilized by organizations with an end goal to connection remuneration to enhanced worker execution.

Empirical Review

Hooi(2013) investigated employee loyalty at workplace with focus on the impact of Japanese style of Human Resource Management. As indicated by Hooi (2013), loyalty is a mental connection or sense of duty regarding the organization and creates subsequently of expanded fulfillment. He included that aemployee who has built up a full of feeling to the organization will probably show steadfast practices and work towards the general objectives of the organization. He watched that worker loyalty is high in organizations that practice great working relationship, inspiration and great workplace. It energizes cerebrum pick up and debilitates mind deplete.

Mohammad &Mahsa (2015) researched on stages of loyalty as a psychological attachment to a company or selected brand which is often in the form of a long term and on-going relationship with the brand. They explained the concept of loyalty as it develops from single stage to four stage loyalty. The three dimensional loyalty are cognitive, behavioural and affective loyalty the fourth dimensional include conative loyalty. Good knowledge of loyalty is important as it

enhances understanding of how to deal with employees at work place or customers of a brand product.

Upasana (2015) inquired about on impact of pay on employee loyalty to organization and characterized employee loyalty as how well the staff are loyal to the organization, having a sentiment holding, consideration, care, obligation and commitment towards it, including that it can be depicted as the degree to which there is a general readiness among employees to make a speculation or faculty yield for the benefit of the organization. He portrayed pay as a composed practice that includes adjusting the work worker connection by giving financial and non-money related advantages to employee. It helps in propelling the employees and enhancing organizational adequacy. He watched that today business condition is quick paced, corporate development, benefit and efficiency are basic, subsequently the need to bound and hold a group of faithful employees.

Loaloa, Labib&Nawar (2016) surveyed the effect of organizational climate in employee commitment depicting climate as the moderately stable nature of an office situation experienced by people, impacting their practices and being founded on aggregate impression of individuals of the workplace. Organizational commitment as a basic worker state of mind is viewed as key segment in the organization. The review highlighted the significance of school climate and scholarly staff duty among workers of various levels.

Owie and Apanga (2016) in their work on word related health hazards winning among health works in creating nations characterized word related danger as the potential hazard to the soundness of a man rising up out of an undesirable domain which is a noteworthy medical problem. They watched that security of workers from business related scatters is not a need in many creating nations somewhat on the grounds that few other health related issues have contended with word related health. It was additionally watched that the administration of medicinal waste represents a high hazard to human services in creating nations, the review uncovered different types of normal word related health dangers that health specialists experience while giving consideration to customers in developing countries.

METHODOLOGY
Research Design
In this study, quasi-experimental research design was used. The reason is because the subject of this investigation is human being which cannot be subjected to laboratory experiment.

Population of the Study
The population of the study is 150 private hospitals in Rivers State, Nigeria but the accessible population is restricted to eight private hospitals in Port Harcourt. The choice for the selection of these eight hospitals is that they have existed over a decade, have related staff strength, have qualified health professionals, standard facilities and defined payment structure and pay roll. The category of health workers to be covered in this study includes the doctors, nurses, pharmacists, and laboratory technologists and they are 127.

Sampling and Sample Size Determination
In this study, simple random sampling was used. The reason for adopting this technique is to give every qualified member chance of being selected; Taro Yamen formula was also used for the selection of the participants. Therefore, the sample size of this work is 96. Also, to determine the minimum number of respondents for each hospital, Bowley's population allocation formula was used.

Methods of Data Analysis.

In analyzing the data of this study, and testing the hypotheses, the Spearmen Rank Order Correlation Coefficient was used. While the partial correlation was used in testing the effect of the moderation role of organization climate on the predictor and criterion variable. The predictor variable is compensation and its dimensions are pay compensation and equity based compensation (stock). The dimensions and measures were measured using five (5) points measuring instrument.

Table 2: Population Allocation

S/N	Hospital	No of employees	Questionnaire Allocated
1.	Meridian Hospital	15	11
2.	New Mile I Hospital	17	13
3.	Palmas Hospital Ltd	10	8
4.	St. Martins Hospital	23	17
5.	Ebony Hospital	17	13
6.	Sonabel Medical Center	12	9
7.	Rehoboth Specialist Hospital	8	6
8.	Prime Medical	25	19
	Total	**127**	**96**

Source: Survey Data 201

Hypotheses Testing Results

Table 3: Test for Hypothesis 1

Ho₁ There is no significant-relationship between pay and cognitive loyalty of health workers in Rivers State.

Correlations

			Pay Compensation	Cognitive Loyalty
Spearman's rho	Pay Compensation	Correlation Coefficient	1.000	.171
		Sig. (2-tailed)	.	.027
		N	96	96
	Cognitive Loyalty	Correlation Coefficient	.171	1.000
		Sig. (2-tailed)	.027	.
		N	96	96

Source: SPSS Output 2017

The result of the analysis shows a significant level *p*< 0.05 (0.027 < 0.05), rho = 0.171. This means that there is a significant positive relationship between pay and cognitive loyalty. The null hypothesis is rejected.

Table 4: Test for Hypothesis 2

Ho₂ There is no significant-relationship between pay and behavioural loyalty of health workers in Rivers State.

Correlations

			Pay Compensation	Behavioural Loyalty
Spearman's rho	Pay Compensation	Correlation Coefficient	1.000	.221
		Sig. (2-tailed)	.	.031
		N	96	96
	Behavioural Loyalty	Correlation Coefficient	.221	1.000
		Sig. (2-tailed)	.031	.
		N	96	96

Source: SPSS Output 2017

The result of the analysis shows a significant level *p*< 0.05 (0.031 < 0.05), rho = 0.221. This means that there is a significant positive relationship between pay and behavioural loyalty. The null hypothesis is rejected.

Table 5: Test for Hypothesis 3
Ho₃   There is no significant-relationship between equity based compensation (stock) and cognitive loyalty of health workers in Rivers State.

Correlations

			Equity Based Compensation	Cognitive Loyalty
Spearman's rho	Equity Based Compensation	Correlation Coefficient	1.000	.364
		Sig. (2-tailed)	.	.000
		N	96	96
	Cognitive Loyalty	Correlation Coefficient	.364	1.000
		Sig. (2-tailed)	.000	.
		N	96	96

Source: SPSS Output 2017

The result of the analysis shows a significant level *p*< 0.05 (0.000 < 0.05), rho = 0.364. This means that there is a significant positive relationship between equity and cognitive loyalty. The null hypothesis is rejected.

Table 6: Test for Hypothesis 4
Ho₄   There is no significant-relationship between equity based compensation (stock) and behavioural loyalty among health workers in Rivers State.

Correlations

			Equity Based Compensation	Behavioural Loyalty
Spearman's rho	Equity Based Compensation	Correlation Coefficient	1.000	.018
		Sig. (2-tailed)	.	.004
		N	96	96
	Behavioural Loyalty	Correlation Coefficient	.018	1.000
		Sig. (2-tailed)	.004	.
		N	96	96

Source: SPSS Output 2017

The result of the analysis shows a significant level *p*< 0.05 (0.004 < 0.05), rho = 0.018. This means that there is a significant positive relationship between equity and behavioural loyalty. The null hypothesis is rejected.

Table 7:   Moderating effect of Organizational Climate on the Relationship between Compensation and Employee Loyalty

Control Variables			Compensation	Employee Loyalty
-none-[a]	Compensation	Correlation	1.000	.321
		Significance (2-tailed)	.	.001
		df	0	94
	Employee Loyalty	Correlation	.321	1.000
		Significance (2-tailed)	.001	.
		df	94	0
Organizational Climate	Compensation	Correlation	1.000	.213
		Significance (2-tailed)	.	.038
		df	0	93
	Employee Loyalty	Correlation	.213	1.000
		Significance (2-tailed)	.038	.
		df	93	0

a. Cells contain zero-order (Pearson)
correlations.

Source: SPSS Output 2017

Table 7 shows the relationship between the independent and the dependent variable with and without the influence of a moderating variable. Without a moderating variable, the relationship between Compensation and Employee Loyalty is at a significant value *p* = 0.001, and a correlation of rho = 0.321. With the influence of a moderating variable (Organizational Climate), the significance still remains at *p* = 0.038, at rho = 0.213. The partial correlation analysis shows that Organizational Climate significantly moderates the relationship between the two variables. Therefore, the fifth null hypothesis, *Organizational climate does not significantly moderate the relationship between compensation and employee loyalty of health workers in Rivers State*, is rejected**.**

The result is based on correlations and it is a two-tailed, non-directional study. The Spearman's Rank Correlation was used to test the correlations and strength of relations. The partial correlation was used to test the moderating effect of Organisational Climate on the relationship between Compensation and Employee Loyalty. The decision rule is to reject the null hypotheses where *p*<0.05 significant level and accept the null hypotheses where *p*> 0.05.

DISCUSSION OF FINDINGS

There is significant-relationship between pay and cognitive loyalty of health workers in Rivers State, Nigeria.

The results from table shows a significant level p<0.05 (0.027<0.05), rho = 0.171.This result shows a significant positive relationship between pay and cognitive loyalty. The null hypothesis is rejected. This is in line with the view of Geshart,Minkoft and Olsen (1995) that when employees are well paid, they perform better and are ready to stay in the organization.

There is significant-relationship between pay and behavioural loyalty of health workers in Rivers State, Nigeria.

The result of the statistical analysis shows a weak positive relationship, while the significance level is 0.031, the rho is 0.221. Therefore the null hypothesis is rejected. This means that there is significant positive relationship between pay and behavioural loyalty. Employees can respond positively when their pay is improved. It is in this line that Noah and Steve (2012)

pointed out the employees have the tendency to react towards supervision, pay, benefits, promotions or anything that might trigger positive or negative reactions. The employees will work towards the actualization of organizational objectives when they are well remunerated. The organization will also be sure of their loyalty.

There is significant-relationship between equity based compensation (stock) option and cognitive loyalty among health workers in Rivers State, Nigeria.

The statistical result shows a significant level of $p < 0.05$ (0.000<0.05) rho = 0.304. This means that there is a significant positive relationship between equity based compensation (stock) option and cognitive loyalty. Contemporary organizations are shifting attention to this system of remunerations. This is different from traditional monthly salary system. By equity based compensation employees as rewarded with shares. This in effect gives them sense of belonging and right to vote during meetings. Equity incentives and stock based compensation are important features of the contracting environment between shareholders and executives (John, Guay and David 2003). It induces loyalty of the employees and enhances corporate governance.

There is significant-relationship between equity based compensation (stock) option and behavioural loyalty of health workers in Rivers State, Nigeria.

The result of the analysis shows a significant level $p<0.05$ (0.005 < 0.05), rho = 0.018. This result means that there is a significant positive relationship between equity based compensation (stock) option and behavioural loyalty. The null hypothesis is rejected, when the organizations allow the employees to own shares in the organizations, it gives the employees the opportunity to become shareholders. This influences the behavior of the employees positively hence to perform at efficiency level. It also encourages retention. Also, Lucian and Jesse (2010) pointed out the under a typical stock option plan, a specified number of options vests each year's work. Such vesting schedule encourages an executive to remain with the firm.

Moderating effect of organizational climate on the relationship between compensation and employee loyalty.

This analysis examines the moderating role of organizational climate on the relationship between compensation and employee loyalty. With the impact of organizational climate which is the moderating variable the level of significance is at $p=0.038$ while rho is 0.213. From the partial correlation analysis, organizational climate significantly moderates the relationship of two variables which are compensation and employee loyalty. The null is rejected. In every organization, organizational climate includes policies, working environment, leadership and communication. Occupational hazards can be viewed as potential risks to the health of a person emerging from an unhealthy environment which is a significant public health issue (Owie&Apanga 2016).

CONCLUSION

Putting our points together it has been established that compensation has strong influence on employee loyalty. Employees perform at efficiency level when they are effectively motivated. Apart from the monthly payment of salary which is conventional method of remuneration, employees can also be rewarded with stock option. This is a way of inducing loyalty among employees, hence making the employees to increase their productivity and being part of achieving organizational objective. When employees are properly rewarded, they are encouraged and also willing to stay with the organization. This encourages retention,

discourages employee turnover and reduces loses in the organization.

RECOMMENDATIONS

From the data analysed and results obtained, the following recommendations are necessary to help solve the problems indentified.

- Regular payment of employees salary will impact positively on the cognitive loyalty of the employees.
- Increment of employee salary enhances positive reactions of the employees thereby inducing loyalty.
- Organizations should encourage the employees to own shares as it induces cognitive loyalty among workers.
- Equity based compensation influences employee behaviour positively thereby encouraging retention of employees.
- Organisations should consider occupational hazards of hospital environment when fixing the pay of the employees.

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Ambidexterity and Organizational Resilience of Telecommunication Firms in Port Harcourt, Rivers State

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ABSTRACT

This study examined the relationship between ambidexterity and organizational resilience among telecommunication firms operating in Port Harcourt, Rivers State. Cross sectional research design was adopted in studying the four selected telecommunication firms. The number of respondents engaged for this study is forty (40) functional unit managers at the head offices of the firms studied. From the field survey, we retrieved and analyzed forty (40) copies of questionnaire using Spearman's Rank order correlation coefficient statistical tool which was adopted in order to determine the relationship existing between the variables. The findings reveal that the dimensions of ambidexterity namely; exploration and exploitation exhibited significant relationship with organizational resilience. We then concluded that organizations that are ambidextrous in their leadership, structures/designs and in the utilization of dynamic capabilities possessed are resilient. This gave rise to our recommendation that organizations operating in this era of stiff competition should adopt exploitative and explorative strategies so as to effectively utilize their current competencies as well as being strategically positioned to take advantage of opportunities in the business environment in order to remain competitive and resilient.

Keywords: Ambidexterity, Exploitation, Exploration and Organizational Resilience

INTRODUCTION

Present day organizations operate in environments encumbered with unprecedented changes arising from the operations of competitors as well as other agents within the environment of business, for survival and sustainability therefore, individual firms ought to be equipped with requisite capabilities that will enable strategic response to the complexities prevalent in the environment. Customers' lamentation over the perennial issues of poor quality of services; this has led to in increased drop calls, depletions of credits, unsolicited short text messages (SMS), among others have necessitated that service providers (the telecommunication industry) develop approaches, practices and methodologies to proffer a lasting solution to the identified drawbacks. It is evident that firms who are able to speedily attend to these perceived needs will have competitive advantage over others and consequently become more resilient. Organizational resilience according to Holling and Gunderson (2002) is the amount of disturbance a given system can tolerate and still persist.

The concept – organizational resilience has attracted research interest from scholars focusing on differing cultures, contexts, sectors, countries adopting various explanatory variables; Umoh and Amah (2013) examined the effect of knowledge management on organizational resilience among manufacturing companies in Rivers State. Organizational resilience has been argued to respond significantly to management development practices among selected

manufacturing firms in Port Harcourt (Umoh, Amah, & Wokocha, 2014). Eketu and Ifionu (2015) in their study evaluated the impact of firms' collaborative behavior on enterprise resilience of banks in Nigeria. Organizational resilience has been predicted by mentoring (Jaja & Amah, 2014) in the Nigerian manufacturing industry. Ikechukwu (2016) also investigated the association of innovation and organizational resilience among some manufacturing firms in Enugu State, Nigeria.

From the studies conducted above, it would interest us to know that none of the scholars had examined the relationship between ambidexterity and organizational resilience. Also none of the highlighted works was carried out on the Nigerian Telecommunications Industry thus resulting to an identified gap in literature. It is in attempt to bridge this gap that this study is embarked on to examine the relationship existing between ambidexterity in the management of resources and opportunities and organizational resilience of telecommunications firms operating in Port Harcourt City of Rivers State, Nigeria.

THE CONCEPT OF AMBIDEXTERITY

Ambidexterity in its literal meaning is the ability to use both hands with equal ease. 'Organizational ambidexterity' as a construct was first coined by Robert Duncan (1976) but March (1991) received the credit for having shed light into the concept by introducing the paradoxical components of ambidexterity which are 'exploration' and 'exploitation' which enables the organization to remain adaptive and creative in her given environment of business. The term connotes the balance between explorative and exploitative organizational strategies (Raisch & Birkinshaw, 2008; Gibson & Birkinshaw, 2004; He & Wong, 2004; Benner & Tushman, 2003). Thus short and long run success is determined by the ability of organizations to be both exploitative and explorative in the management of their competencies and opportunities as competitive advantage accrue to organizations that can actualize such a balance (Gibson & Birkinshaw, 2004; He & Wong, 2004).

Approaches highlighted by literature as enabling organizational ambidexterity can be seen as helping the organization manage its resources adequately and also helping it to be properly positioned to take advantage of opportunities in its environment of operation. Firm's resources (human and non human) include all the assets, capabilities, internal processes, firm's attributes, information and knowledge which are controlled by the firm that enables it conceive and implement strategies that improve efficiency and effectiveness (Barney, 1991). Resources at the disposal of an organization could be a potential source of competitive advantage. These resources are used in combination to develop products and services that are valuable to the customer. Porter (1981) describes firm's resources as strengths that firms can use to conceive of and implement their strategy.

Dimensions of ambidexterity are adapted from the study conducted by Mom, Van Den Bosch and Volberda (2007) to include; exploration (attempt towards creating variety of firm' experience) and exploitation (attempt towards creating reliability of firm's experience) as noted by Bontis, Crossan and Hulland (2002).

EXPLORATIVE ACTIVITIES AND ORGANIZATIONAL RESILIENCE

In the past two decades, change has been mentioned by executives of business institutions as a paradoxical factor that must be surmounted within the arena of business stated Palmer, Dunford and Akin (2009); paradoxical in the sense that it is both challenging to adhere to its demands and at the same time an important call to heed having that the business environment is in a state of constant transition; to continue in existence and thrive therefore, business

executives are admonished to constantly align with the tides or risk the tendency of sinking by the waves (Higgs & Rowland, 2005; Beer & Nohria, 2000).

Suggested theories from extant research steer towards advocacy for change other than adaptation; so that organizations who are flexible and innovative will survive other than their rigid and non-innovative counterparts (Barnett & Freeman, 2001; Pettigrew, Woodman, & Cameron, 2001; Barnett & Carroll, 1995); thus the modern workforce is required to adapt to these realities.

Repeated in organizational theory is the subject matter – 'ambidextrous enterprises'; such enterprises thrive and succeed in changing environments (Mickers, 2011); Gibson and Birkinshaw (2004) asserts that these business organizations align efficiently towards current business demands and also adapt effectively to changes in the business environment; thus this behavior is required for survival of business institutions (Jansen, van den Bosch, & Volberda, 2005; Gibson & Birkinshaw, 2004; He & Wong, 2004) because revolutionary change is created and sustained by it (Tushman & O'Reilly, 1996), competitive advantage is gained (Grant, 1996), and exploratory and exploitative innovations are made possible (Benner & Tushman, 2003; Levinthal & March, 1993; March, 1991).

Gibson and Birkinshaw (2004) created the complementary contextual (individual) ambidexterity which calls for individual employees to make choices between adaption-oriented and alignment-oriented activities. Rather than creating dual structures, contextual ambidexterity expects organizational leaders to create the context in which all individual employees are encouraged to divide their time between the two conflicting demands of adaption and alignment. Thus we hypothesize;

H0₁: Explorative activities of the firm have no significant relationship with organizational resilience of the firm

EXPLOITATIVE ACTIVITIES AND ORGANIZATIONAL RESILIENCE

Refinement of existing organizational competencies delineates exploitation while knowledge search in potential competencies and opportunities connote exploration (March, 1991). Firm's sustainable advantage relative to its competitiveness is dependent on how well a happy medium is stricken between the two sets of activities. Thus ambidexterity has been defined by authors and researchers as the dual pursuit of exploitative and explorative activities (Gibson & Birkinshaw, 2004, He & Wong, 2004; Tushman & O'Reilly, 1996).

Tushman and O'Reilly (1996) showed exploitation as having to do with incremental changes and innovations within the organization. Lubatkin, Simsek, Ling and Veiga (2006) indicated ambidextrous organizations as those business units who are capable of exploiting existing competencies as well as exploring new opportunities with equal dexterity.

Effectiveness in explorative activities of the firm can result success in exploitative activities (Cao, Gedajlovic, & Zhang, 2009). Accordingly, successful explorative activities can lead to improvement in exploitative activities of the business organization, because as knowledge is acquired from external sources and utilized, to exploit those potentials, more requisite competencies are required (Cao et al., 2009).

There is usually a trend towards greater certainties, greater speed, clarity and explicit knowledge of activities when striving for exploitation suggestive of the fact that less effort is allocated unto revolutionary innovative activities with its possible consequent outcome as

knowledge obsolescence (Cao et al., 2009; Lubatkin et al., 2006). Moreover, idea continuity, formal procedures, routine, standards and repetition abounds within its scope thus accounting for corporate resilience (Cao et al., 2009; Gilsing, 2002).

Cao et al. (2009) in their study – "Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects", developed two dimensions in an attempt to illuminate the construct organizational ambidexterity; balance and combined dimensions of ambidexterity; regarding balance dimension, they noted that business organizations may be at the risk of failure   for a lack of balance between explorative and exploitative activities, suggesting that striking a good balance between the series of activities will result in corporate resilience for the business organization.

Exploitation aims to find new applications for existing knowledge (Levinthal & March, 1993). Exploration is an intrinsic part of a company's search for knowledge as it scouts for innovations that may be used in future applications, eventually providing for a positive interplay between exploration and exploitation.

The returns of exploration, however, are long term and uncertain, whereas those from exploitation are more short term, securing the resource base for investment in novel technologies (March, 1991); both seem to be necessary to maximize firm performance. Thus we hypothesize thus;

H0₂: Exploitative activities of the firm have no significant relationship with organizational resilience of the firm

RELATIONSHIP BETWEEN AMBIDEXTERITY AND ORGANIZATIONAL RESILIENCE

Business organizations who are ambidextrous are evolutional and at the same time revolution of organizational practices are their major concern (Tushman & O'Reilly, 1996), they create and sustain good competitive positions (Grant, 1996), they are aptly responsive and efficient in operations (Hanssen-Bauer & Snow, 1996), they constantly adapt to changes and also embed favorable outcomes (Volberda, 1996), they are both exploratory and exploitative (Benner & Tushman, 2003; Levinthal & March, 1993; March, 1991). The conflicting demands from task environments are adequately reconciled; effort is directed towards exploration of new opportunities as well as exploitation of existing organizational capabilities (Volberda & Lewin, 2003). KFC, Pizza Hut, and Hardee's as chain organizations have been able to concurrently achieve innovativeness and control of such innovative outcomes (Bradach, 1997). Similarly, big corporations such as Hewlett-Packard (HP), Johnson & Johnson, and Asea Brown Boveri (ABB) have successfully remained competitive by launching both incremental innovation and discontinuous innovation in well established markets and in emerging markets respectively (Tushman & O'Reilly, 1996); these organizations operate in different industries, however each of them has been able to renew itself by simultaneously exploiting existing competencies and exploring new ones thus resulting to better organizational resilience stance manifested in firm's adaptive capacity.

The key driver of long term performance for modern business establishments becomes ambidexterity as a firm's ability to compete successfully in the long run depends on its ability to jointly engage in exploration activities and exploitation activities (Raisch & Birkinshaw, 2008). To become ambidextrous therefore, business organizations need to strike a happy medium between conflicting demands (Raisch & Birkinshaw, 2008). To this end, telecommunication firms in Nigeria are presently looking inwards and outwards to

strategically exploit and explore possible opportunities that abound in their industrial environment of operation; this is made manifest through a wide variety of products and services churned out in the market alongside other background technological investigations directed at improving performance levels, with the consequent bottom line effects.

METHODOLOGY

This study adopted a cross sectional survey research design in engaging four telecommunication firms out of eighteen (18) registered with the Nigeria Communications Commission (NCC) which forms our accessible population, however our study units include the managerial employees of the firms having that our unit of analysis is organizational and such employees are to stand in proxy for the organization. The human resource department provided us the data on functional departments within the organization. Because the study elements were remarkably few in number; there was no need for sampling as we included all as our study objects. The instrument with which we elicited data from the respondents is the questionnaire (40 copies of questionnaire) and was analyzed using Spearman's Rank order coefficient of correlation statistical tool.

RESULTS AND DATA ANALYSES
Table 1: Spearman' rank order correlation coefficient: A test of association between the variables

			Explorative Activities	Exploitative Activities	Org. Resilience
Spearman's rho	Explorative Activities	Correlation Coefficient	1.000		
		Sig. (2-tailed)	.		
		N	40		
	Exploitative Activities	Correlation Coefficient	.907**	1.000	
		Sig. (2-tailed)	.000	.	
		N	40	40	
	Org. Resilience	Correlation Coefficient	.972**	.884**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	40	40	40

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

SPSS Output, Version 20 (2017 Field Result)

The Spearman rank correlation table above measures the strength of association between the variables as follows;
The result reported a strong positive correlation between explorative activities of the firm and organizational resilience (rho = .972, n = 40, p < 0.01); thus we reject the null hypothesis **(H0₁)** to state that there is a significant relationship between explorative activities of business organizations and their resilience stance.

The result also showed a strong positive correlation between exploitative activities of the organization and organizational resilience (rho = .884, n = 40, p < 0.01); this results to the non acceptance of the stated null hypothesis **(H0₂)** to state that there is significant relationship between exploitative activities of the firms and enhanced corporate resilience.

Table 3: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941[a]	.885	.879	2.461
a. Predictors: (Constant), Exploitative Activities, Explorative Activities				

SPSS Output, Version 20 (2017 Field result)

The model summary reports a correlation coefficient value of .941[a] for the dimensions of ambidexterity (explorative and exploitative activities) indicating that there exists a positive association between the dimensions and organizational resilience of firms, the Adjusted R Square value of .885 (85.5%) represents the coefficient of determination which is the explained variation in organizational resilience as accounted for by explorative and exploitative activities of the firm; indicative of the fact that corporate resilience stance firms can be enhanced by being ambidextrous.

DISCUSSION OF FINDINGS

The result of the tested **H0$_1$** suggests that there exists significant relationship between firm's explorative activities and organizational resilience. This agrees with the opinion Cao et al. (2009) as they held that exploration activities delineate firm's orientation towards innovativeness with regards to the introduction of new products and markets, introduction of new generation of processes, widened range of product and services offerings thus diversifications into new markets, and entering new technological fields which will ultimately improve the firm's adaptive capacity in the environment of operation.

Also the result of the tested **H0$_2$** showed that significant relationship exists between firm's exploitative activities and organizational resilience; this finding is supported by Popadiuk and Bido (2016) in asserting that explicit knowledge is more present in exploitation, and there is an idea of continuity, routine, standards and repetition which would increase efficiency in operations over time. In addition, Turner and Lee-Kelley (2012) advocated that adding competencies and skills would ultimately increase the possibility of rewards for the organization as a whole.

CONCLUSION

Present day organizations require ambidextrous leaders and managers with requisite capacities and competencies need to be optimally exploited alongside exploring into potentials existent within the environment of business. The study revealed the role of leaders of business organizations in instituting structures that are consistently flexible, organic and one that is permeable allowing for constant alignment and responsiveness to changes in the business environment through explorative and exploitative activities.

Congruence between the firm's strategy and its environment is enhanced by dynamic capabilities possessed by organizational leaders thus enabling the competitiveness building, integrating and reconfiguring resources to maintain desirable performance outcomes in the face of high volatility in the business arena; this view is in consonance with Helfat (2000).

RECOMMENDATIONS

From the research analysis and conclusions above, the following recommendations are made for the benefit of telecommunication firms alongside other institutions;

Organizational leaders should acquire traits that would enable ambidexterity, because the trajectories of any given organization are communicated by these leaders who directly influence performance outcomes.

Telecommunication firms should maintain a very flexible structure that allows for speedy responsiveness to the demands of their customers as well as strategic response to their competitors; by exploiting existing competencies as well as exploring into possible opportunities in order to improve performance of the organization.

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Risk Taking nd Survival of Small and Medium Scale Enterprises in Nigeria

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ABSTRACT

The study investigated the relationship between risk-taking and the survival of small and medium scale enterprises in Port Harcourt. The cross sectional survey method was adopted. A sample size of eighty was drawn from a population of one hundred employees using the Taro Yamane formula. The questionnaire was the main instrument for data collection and data obtained was analysed using the SPSS. Spearman's rank correlation coefficient was used to test the hypotheses. Our findings revealed a strong and positive relationship between risk-taking and the measures of organizational survival. We concluded that risk-taking ability might proportionately predict the organizational performance and success level of a firm. We recommended that due to the complacent level in risk taking as discovered in the study, government should provide current statistics to enable small and medium scaled industries take calculated risk. It will be necessary that firms be given soft loans by banks to enable them undertake more innovative and enterprising activities. Government ought to as matter of criticality help planned business visionaries to have admittance to the public purse to back them up. This could enable them identify business opportunities and take the risk of embarking on them.

Key words: Risk-taking, survival, small scale enterprise, medium scale enterprise.

INTRODUCTION

Overtime, it has been observed that Small and Medium-scale Enterprises (SMEs) play critical roles in the process of industrialization and sustainable Organizational Survival as it has enabled entrepreneurship activities through which employments have been generated and poverty reduction and sustainable livelihood achieved (Ikem et al., 2012), The existence of small and medium enterprises (SMEs) is so unique to the nation and that is why sometimes, they are described as engine of growth of most economies of the world (Ibrahim, 2015). However, the take off and efficient performance of any industrial enterprise, be it small or large, will require a sound accounting technique, tools and system.

Taylor (2013) found that SMEs managers that are willing to take risk are more likely to achieve higher performance and growth irrespective of the business environment in which they operate. Keh, Nguyen, and Ng (2007) in their study found that risk taking has influential role on information acquisition and utilization of marketing information for their competitive capacity that led to high organizational performance and success.

Lyon et al., (2000) and Nowduri et al., (2002) assert that SMEs facilitate easy distribution of economic wealth and the decentralization of economic growth. Conversely, despite the contributions of these SMEs to national development they are responsible for most of the

breakthroughs and advances in new products and process. They contribute to the alleviation of poverty through employment creation, equitable distribution of wealth, provision of flexible and specialized service to large scale industries, stimulation of economic development and national growth by participating mostly in the untapped markets. However, SMEs and their impacts have been less satisfactory and their performances have fallen short of expectation particularly in the developing economies of the world (Manbula, 2002).

Over the past decade, much has been written about risk taking and organizational survival. Despite the increase in prior publications and studies, the extent to which entrepreneurial behaviors such as risk taking influence organizational survival has not been sufficiently clarified (Zahra and Covin, 1995). The study specifically examined the relationship between risk taking and organizational survival in selected SMEs in Rivers State.

Objective of the Study
1. To investigate the relationship between risk taking and organizational survival in selected SMEs in Rivers State.

Research Hypotheses
Ho$_1$: There is no significant relationship between risk taking and customer satisfaction of SMEs in Rivers State.
Ho$_2$: There is no significant relationship between risk taking and adaptability of SMEs in Rivers State

REVIEW OF RELATED LITERATURE
Risk-taking
Lumpkin and Dess (1996) considered risk-taking as management decision-making process that accept the willingness to undertake uncertainty, and seize opportunities in the market place by committing large resources with the expectation to achieve high returns on investment. Risk taking represents a willingness to withstand uncertainty and mistakes as one explores new ideas, advocates unconventional or unpopular positions, or tackles extremely challenging problems without obvious solutions, in order to increase the likelihood of accomplishment (Neves and Eisenberger, 2014).

The concept risk is not sufficiently defined in the literatures of entrepreneurship and management theories. It is a concept whose meaning differs according to the different authors and in the context in which it is used. Mitchel (1995) submitted that embarking on any new ventures, start-ups etc. involve risk, or the possibility that actual result may differ from expectation and that uncertainty is the source of risk, for if there had been no uncertainty, there would also be no risk. Risk according to Dhliwayo and Vuuren,(2007) is an important element of the strategic entrepreneurial attitude that involving creativity, innovation and capturing opportunities that leads to organizational wealth creation and organizational survival. Lewin and Stephen (1995) studied risk-taking propensity in organizations and indicated that risk-taking propensity is the degree to which individual organizations exhibit, support and willingness to make risky commitments of resources and funds across situation of uncertainty for the purpose of capturing opportunities. Too little and too much risk taking are both dangerous for organizations' long-term welfare (Wicks et al., 1999). The degree of optimal risk may vary substantially by job type and organization, making it a "conditional good" (Molina-Morales et al., 2011, p. 118) risk taking has major implications for employee and organizational outcomes and is therefore an important topic to study.

The Concept of Organizational Survival

Maheshwari (1980) argued that the concept of Organizational survival is a multiple dimensional concept with no common definition, making it elusive that there is no one single way of defining organizational survival. This fact may be due to the many criteria used to measure organizational survival and the many definitions available for the concept. He further defined success as the ability of an organization to achieve an acceptable outputs and expectations which are in line with the organizational goals and objectives. Evidence found in the entrepreneurial, management and business literatures confirmed that organizational survival and organizational performance are very narrowly connected (Perren, 2000; Jennings and Beaver, 1992). Also, according to De-smet et al, (2006) success can be defined as an organizational ability to operate effectively and efficiently, coping adequately and being able to withstand the environmental turbulences by being flexible and adapting to change which may result to growth. Imoisili (1978) defined Organizational survival as organization's ability to achieve sustainable growth and realization of its goals which leads to eventual superior performance. Similarly, Beaver and Jenning (1995) are of the view that the most commonly adopted description of organizational survival has much to do with financial viability and growth with sufficient profits than other factors such as owner's satisfaction, employee satisfaction etc. Simpson et al., (2007) maintained that organizational survival is a multi-dimensional concept which has no single significant element as its measures of analysis. Simpson et al., (2004) noted that there are two major indicators of success: the financial and non-financial measures. The financial performance measures of organizational survival includes: profitability, returns on capital, productivity of assets, sales margins, net operating margin etc. while the non-financial indicators are the degree of employee satisfaction, ability to retain management talent , the degree of customer satisfaction, owners' satisfaction, superior products and services etc. On the other hand, determination of the right criteria is paramount in getting the accurate result. According to Masuo (2001) to avoid errors in determining the measures, the selections of appropriate measure should depend on the type or nature of the organization under review, the various environmental factors, cultures, management styles, capital availability, technology and goal of the organization should be considered. This argument is based on the fact that every organization has its different characteristics, goals and constituencies. Paige and Littrell (2002) assert that some scholars includes subjective (intrinsic) criteria such as freedom and independence, being one's own boss, controlling one's own future; while the objective (extrinsic) factors such as increase profitability and wealth as the criteria for organizational survival. Cameron (1979) suggested that there are other criteria that could be used in the measurement of organizational survival such as effectiveness and efficiency. Organizational survival will be defined as the ability of a firm to realize and actualize its outcome and expectations in line with its mission, goals and objectives

Risk Taking and Organizational Survival

Murugesan & Jayavelu, (2017) suggested that optimistic entrepreneurs (those he referred to as risk takers) will have a better chance at survival than the pessimistic ones. This was a view strongly shared by Parimala & Ilham (2016) who also revealed a strong and significant relationship between innovativeness, risk taking and customer satisfaction and adaptability. They suggested a good blend of these would position an entrepreneur in a better position to survive. According to Neves, and Eisenberger, (2014), risk attitudes have an impact on not only the decision to become an entrepreneur but also the survival and failure rates of entrepreneurs. Their empirical results confirm that persons whose risk attitudes are in the medium range survive significantly longer as entrepreneurs than do persons with particularly low or high risks. Ebiringa (2012) and Adegbite, Ilori and Abereijo (2007) also asserted that risk taking significantly and proportionately predicts the organizational performance and success level of a firm.

RESEARCH METHODOLOGY

The study adopted a cross-sectional survey of the quasi-experimental design. This method is adopted because the respondents who are in their private business are exposed to complex relationships which are not subject to manipulation (Baridam, 2001). This study aimed at examining the relationship between Risk-taking and organizational survival in SMEs in Rivers State. The population for this study comprises of all the Small and Medium Scale Enterprises in Rivers State, registered with the Rivers State Ministry of Trade and Commerce. However, for easy accessibility, the accessible population consists of 120 respondents, (owners-partners, managers and key officers) from the 20 selected SMEs within Rivers State, using purposive sampling technique. It is assumed that responses obtained from the sample respondent would be representative of the opinions of all SMEs operating in Rivers State. The respondents are in position to express their opinion about the questions relating to the research instrument. The sampling procedure adopted in this study is the Simple random sampling techniques. This approach is to enable each member of the population to have an equal chance of being selected. A sample size of eighty (80) owners-partners, managers and key officers was drawn from the twenty (20) selected SMEs under review. The sample size was determined using the sample size determination formula of Taro Yamens formula at 0.05 level of significance (Baridam, 2008)

RESULTS AND DISCUSSION
RESEARCH RESULTS AND FINDINGS
Test of Hypotheses
Hypothesis one
Ho₁: There is no significant relationship between risk taking and customer satisfaction of SMEs in Rivers State.

Table 4.1. Correlation Output of risk taking and customer satisfaction of SMEs in Rivers State.
Correlations

			RISK-TAKING	CUSTOMER SATISFACTION
Spearman's rho	RISK-TAKING	Correlation Coefficient	1.000	.786**
		Sig. (2-tailed)	.	.000
		N	80	80
	CUSTOMER SATISFACTION	Correlation Coefficient	.786**	1.000
		Sig. (2-tailed)	.000	.
		N	80	80

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Statistical Package for Social Sciences (version 22) Extract.

Hypothesis Two
Ho2: There is no significant relationship between risk taking and Adaptability of SMEs in Rivers State.

Table 4.2. Correlation Output of risk taking and Adaptability of SMEs in Rivers State.
Correlations

			RISK-TAKING	ADAPTABILITY
Spearman's rho	RISK-TAKING	Correlation Coefficient	1.000	.727**
		Sig. (2-tailed)	.	.000
		N	80	80
	ADAPTABILITY	Correlation Coefficient	.727**	1.000
		Sig. (2-tailed)	.000	.
		N	80	80

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Statistical Package for Social Sciences (version 22) Extract.

Hypothesis One: Relationship between Risk-taking and Customer Satisfaction- The Table 4.1 above illustrates the analysis for the association between Risk-taking and customer satisfaction of SMEs in Rivers State where Rho = .786 and p = 0.000. The findings shows a very positive and significant association between both variables.. This means that increase in Risk-taking is associated with increase in Customer Satisfaction. **Hypothesis Two:** Relationship between Risk-taking and Adaptability- Table 4.2 above illustrates the analysis for the association between Risk-taking and Adaptability of SMEs in Rivers State where Rho = .727 and p = 0.000. The findings show a very positive and significant association between both variables. There is a significant relationship between Risk-taking and Adaptability of SMEs in Port Harcourt. This implies that increase in Risk-taking is associated with increase in Adaptability.

DISCUSSION OF FINDINGS
Risk taking: Customer Service and Adaptability
In hypotheses one, our findings here showed a significant relationship between risk taking and customer satisfaction this is in line with the revelation of the (Murugesan & Jayavelu, 2017) who suggested that optimistic entrepreneurs (those he referred to as risk takers) will have a better chance at survival than the pessimistic ones. This was a view strongly shared by Parimala & Ilham (2016) who also revealed a strong and significant relationship between innovativeness, risk taking and customer satisfaction and adaptability. They suggested a good blend of these would position an entrepreneur in a better position to survive. The findings is also in line with Neves, and Eisenberger, (2014), who asserted that risk attitudes have an impact on not only the decision to become an entrepreneur but also the survival and failure rates of entrepreneurs

Results on hypotheses two revealed a significant relationship between risk taking and adaptability. It was revealed that entrepreneurs who are more willing to take risk will have a better chance and will find it easier to adopt changes that will help them manipulate and adapt to changes in the environment as also agreed by (Ebiringa, 2012) who suggested that risk taking could be a deciding factor on how easily an entrepreneur adapt to changes. This suggestion was also echoed by (Chononye et. al., 2016) who also advocated that entreprenures should be proactive and take more risk however he suggested they take more careful and articulated risk.

SUMMARY, CONCLUSION AND RECOMMENDATIONS
This paper concludes by fully agreeing with Ebiringa (2012) and Adegbite, Ilori and Abereijo

(2007) who asserted that risk taking significantly and proportionately predicts the organizational performance and success level of a firm. In light of the above, the study recommends that due to the complacent level in risk taking as discovered in the study, it will be necessary that firms be given proper finance by banks to enable them undertake more innovative and enterprising activities.

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Evolution of Free Economic Zones: A Functional Taxonomy

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ABSTRACT
This study investigates the evolution of Free Economic Zones (FEZs) using the functional criteria. The methodology of the study involved analysis of the literature. The study makes five main revelations. First, the evolution of FEZ is in general consistent with theory of city life-cycle that states that a city will undergo different stages such as birth, growth, flourishing and decline. And at each stage there are several specific challenges concerning its industrial structure, enterprise structure, spatial structure and so on. Second, the study identifies five evolutionary phases of FEZs which are: Free Trade Zones, Export Processing Zones, Science Industrial Parks, Service Economic Zones and Special Economic Zones; each of these basic zones contain several variants. Third, as the typical FEZs evolve they change the focus of their functions both vertically and horizontally. In vertical terms the zones change the focus of their activities from trade related to manufacturing of the traded goods. In horizontal terms the zones expand their scope by embracing more sectors such as services, science and residential issues. Fourth, there is a progressively stronger orientation toward technology and skill intensive manufacturing and services. Fifth, FEZs are attractive to investors because of the existence of policy failures in the greater host economy: as policy reforms happen investors will see no need for staying in the FEZs and the relative significance of FEZs in economic terms can be expected to decline; at this point FEZ and non-FEZ firms would be treated equally. These findings lead to two general guidelines for sustainable zone development in a developing country context. First, policy makers should start by encouraging trade-intensive FEZ activities in the zones, followed by labor-intensive manufacturing; later on upgrade to technology- and skill-intensive manufacturing and services. Second, policy makers should encourage FDI in industries in which the country has comparative advantage; this increases the likelihood that development will be sustained long after FEZ incentives are removed and all firms are being treated equally in an economy.

Key words: Free Economic Zones (FEZ); Foreign Trade Zones (FTZ); Evolution; Economic Zones; Export Processing Zones (EPZs); Economic and Technological Development Zones (ETDZs).

INTRODUCTION
The objective of this paper is to explore the evolution of Free Economic Zones (FEZs) from Free Economic Zones to Special Economic Zones. The criterion used to gauge the evolution from one phase to another is the functions undertaken within a zone. This study is motivated by confusion in the extant literature created by the numerous terminologies and definitions around the concept; there is a need to sort out the nomenclature. The paper is based on the observation that most studies (Warr, 1987; Wong and Chu, 1984; Jenkins, Esquivel, & Felipe,

1998; Centre for Education and Documentation, 2009) on the subject focus on the static economic analysis of benefits and costs of FEZs, but little attention has been given to their evolution. In most studies the type of FEZ adopted is invariably taken as given. Little attention is given to "why, when and how" FEZs evolve or adapt to changes in the environment. Failure to take into account the evolutionary nature of FEZ has led to numerous terminologies for FEZ, depending on what stage in the evolutionary process an analyst is looking at. The approach taken in this study is dynamic in the sense that a time element is somewhat incorporated into the FEZ model. The analysis is based on previous studies and secondary sources and a developing country context is assumed.

In the light of the above broad objective and observation, the issues to be studied revolve around seeking answers to two critical questions:
1. How can FEZs be classified into various types or generations on the basis of the functions performed?
2. What theoretical framework can be used to explain and predict the evolution of FEZ?

BACKGROUND: THE CONCEPT, HISTORY AND FEATURES
The Concept of FEZs
Perhaps a logical starting point for studying the evolution of special economic zones is to begin by sorting out the nomenclature on the subject. Free Economic Zone is a generic term used to refer to various types of areas within a nation that offer incentives to attract foreign and local direct investment. The generic free zone concept has evolved over time resulting in a variety of zones with differing objectives and functions. Table 1 gives an overview of the main features of a Zone that help us to understand the evolutionary nature of FEZs. The first three rows show that on the basis of the functions performed, modern FEZs can be classified into five basic types and each basic zone in turn consists of several variants or simply synonyms. The five basic zones are Free Trade Zones (12 variants), Export Processing Zones (14 variants), Science Economic Zones (14 variants), Service Economic Zones (8 variants), and Special Economic Zones (3 variants); a total of 51 variants.

The existence of a myriad of terminologies has resulted in confusion in such a way that different terms are used to describe very similar, often identical, phenomena. In some countries the term SEZ is used as a generic term instead of FEZ (Farole & Akinci, 2011). In this study Free Economic Zone (FEZ) will be used as the generic term that refers to various types of areas within a nation that offer incentives to attract foreign and local direct investment; the term Special Economic Zone (SEZ) will be reserved for the comprehensive zones like the Chinese Shenzhen.

The term FEZ is preferred in this study as a general designation to cover all types of zones, because it can generalize the dominant characteristics of them. "Free" refers to the relaxation of economic laws and immigration policies applicable nationwide so as to benefit firms established within the area chosen as an FEZ. "Economic" refers to the type of activities permitted within the zone. Zone refers to the geographic space demarcated as an FEZ (Farole, 2011: 26-27). FEZ authorities act as 'governments' and ruling authorities within the designated zones. Zone companies are treated as operating from outside the country and their goods treated as imports.

It is observed that many of the terminologies used include the word "free": for example, "Duty free", "free port", "tax free zone", "export free zone" and "free tourist zone" - all these are indistinguishable from each other in terms of meaning. Even though it may seem to be mainly a

matter of semantics, it is useful however, to distinguish between the five basic groups (rather than the variants) since they imply differences in approaches to promoting them. We therefore adopt with adaptation the following definition (Ge, 1999, p. 1268) which is rather broad:

> *"A free economic zone is, in general terms, a geographic area within the territory of a country where economic activities of certain kinds are promoted by a set of policy instruments that are not generally applicable to the rest of the country".*

History of FEZs

FEZs have a long history dating from ancient times. However, before the 1960s, these FEZs only played a minor role in the world economy. The World Bank estimated that in 2008 there were 3000 zones in 135 countries, accounting for over 68 million direct jobs and over $500 billion of direct trade related value added within zones (World Bank, 2008). FEZs are found in both developing and developed countries.

Objectives and Features of FEZs

The main objectives of FEZs are: to attract domestic and foreign direct investment, creation of employment opportunities and to earn foreign exchange (Rondinelli, 1987). To achieve these goals several incentives are normally offered to investors, however, a few features or incentives for firms are typical: development of infrastructure facilities, greatly reduced customs rates, reduction of red tape, tax breaks, relaxed legislation, absence of labour union activity, subsidised land and bureaucracy less susceptible to corruption.

FIVE GENERATIONS OF FREE ECONOMIC ZONES

Trade is the cornerstone of any form of FEZ. The lowest level of FEZ usually involves trade only; higher forms of zones go beyond simple trading to include manufacturing, services and finally the modern all-in-one zones that combine all these operations and residential issues. Table 1 gives an overview of the five broad zone types and four different dimensions or characteristics of FEZs employed in this study to help us understand their evolutionary nature. The dimensions used are the functions, nomenclature, variants, examples of zones, time frame and stage of evolution. We now turn to the discussion of each zone type and its historical evolution that has led to the modern FEZs. It should be helpful in enabling the reader to understand and reflect on the functional variations of contemporary zones.

Free Trade Zones (FTZ): First Generation

In a Free Trade Zone (FTZ), as the name implies, trade is the focus of the zone. It is the oldest and most common form of FEZ. It is a geographic area where goods may be imported in and undergo trade related processes (such as warehousing, storage, sales, exhibition) and light processing operations (such as packaging, labeling, quality control, sorting) and re-exported without the intervention of the national customs authorities. Only when the goods are sold within the host country do they become subject to the prevailing customs duties. Free-trade zones are normally established around major seaports, international airports and national borders, which are areas with many geographic advantages for trade.

FTZs have grown substantially in number and size in recent years, but the concept is not a new one. The concept can be traced as far back as in the ancient times when man started engaging in external trade. During this period enterprising nations started importing goods from one country with the purpose of re-exporting to another. This entrepot trade created the need for secure areas at ports or in strategic locations along trade routes where goods can be stored before re-export. These areas became free zones when government allowed the goods to move in the zone free of local prohibitions, taxation, duties, and excises.

In ancient times, FTZ-like conditions existed in the Phoenician city of Tyre at around 300 BC (Farole, 2011) and at the Greek Island of Delos which as a result became one of the wealthiest islands in the world for nearly a century (Haywood, 2000). During the colonialist days from the early eighteenth to the late nineteenth century, the English and the French developed the following FTZs: Gibraltar in 1704, Singapore in 1819 (FIAS, 2008)**,** Hong Kong in 1841, Aden in 1853 and Djibouti in 1859 (Zhan, 1993). The vast majority of early zones were closely associated and generally collocated with ports. By 1900, 11 FTZs existed globally; of these, 7 were in Europe and 4 in Asia (Farole, 2011: 32). Other examples of FTZs include Dubai (United Arab Emirates), Colón (Panama), Copenhagen, Stockholm and Gdańsk (Poland).

FTZ can be specialized or of general purpose. For example, there are more than 20 Free Trade Zones operating in Dubai and each is designed around one or more specialized industry categories, and licenses are offered only to companies falling within those categories. These industry groups include Auto, Internet, Gold & Diamond and Commodities.

Essentially FTZs function as trading and reshipping zones with limited light processing operations, if any. However, the revolutionary decline in the transportation costs made it possible to move goods efficiently towards where processing or manufacturing had comparative advantages. Thus the "Free Trade Zones" evolved in to Export Processing Zones (EPZs).

Export Processing Zone (EPZ): Second Generation
EPZ is an extension of FTZ into manufacturing. An EPZ is similar to FTZ but is set up for the purpose of managing export manufacturing. It is an area where one is allowed to import plant, machinery, equipment and material for export manufacturing, without payment of customs duties. The imported goods are subject to customs or duty payment if used for home consumption. Other benefits of operating such enterprises include; streamlined Government red tape allowing for one stop registration and licensing and tax concessions. EPZs are economic enclave within which manufacturing for export occurs under virtual free trade conditions. The zones are often used by transnational corporations to set up factories to produce labour intensive goods mainly for export or import substitution.

A "Single Unit EPZ" is a variation of the EPZ in which individual enterprises are provided with an EPZ status and allowed to locate anywhere in the national territory. This approach applies to existing enterprises that wish to have the benefits of the EPZ system but whose relocation costs would be too high or to new enterprises that have a compelling reason not to locate in an existing EPZ. Some countries have no EPZs per se, and the EPZ status is given to individual enterprises. In Mexico, the maquiladora status is of this type. Mauritius, one of Africa's most famous and successful examples of EPZ, is another example.

Manufacturing entered the realm of free economic zone activities only in the 20th century when free trade zones started being used for manufacturing also. Perhaps the world's first modern EPZ was established in Shannon, Ireland in 1958 (Farole, 2011). It was the result of an external threat. As aircraft technology developed, trans-Atlantic flights no longer needed to stop at the Shannon airport to refuel. To safeguard continued vitality of the airport as well as the town, Ireland reduced tariffs and lowered taxes in Shannon. It was a big success and is still in operation today. Shannon provided the basic model for EPZs, which was replicated across the globe in subsequent decades (Madani, 1999).

Table 1: The Evolution of Free Economic Zones: A Functional Typology					
Functions →		**Trade-based**	**Manufacturing-based**	**Science-based**	**Services-based**	**Comprehesive**
Dimensions	**Generic Name →**	*Free Trade Zone*	*Export Processing Zone*	*Science Industrial Park*	*Service Economic Zone*	*Special Economic Zone*
	Synomyms / Variants	1. Bound house zone 2. Customs bounded warehouse 3. Customs free zone 4. Duty free zone 5. Foreign trade zone 6. Free border zone 7. Free frontier zone 8. Free trade zone 9. Tax free trade zone 10. Tax free zone 11. Transit Zone 12. Transshipment zone	1. Duty free export processing zone 2. Economic & technological development zone 3. Export free zone 4. Export processing free zone 5. Free agricultural processing zone 6. Free enterprise zone 7. Free export processing zone 8. Free export zone 9. Free production zone 10. Import processing zone 11. Investment promotion zone 12. Maquiladoras (Mexico) 13. Privileged export zone 14. Single Unit EPZ	1. Academic town 2. Biopark 3. High-tech development zone 4. High-tech industrial area 5. High-tech park 6. Incubator 7. Research park/area 8. Research triangle 9. Science & industrial park 10. Science & technology park 11. Science city / town 12. Tech-development park 13. Technology park 14. Technopoleis	1. Free banking zone 2. Free tourist zone 3. Free gambling zone 4. Free insurance zone 5. Free medical zone 6. Free professional zone 7. Free red light zone 8. Free service zone	1. Comprehensive free port 2. Comprehensive free trade zone 3. Freeport
	Examples	• Aden • Colón - Panama • Copenhagen • Djibouti • Dubai – U A Emirates • Genoa - Italy • Gibraltar - • Hamburg - Germany • Hong Kong • Singapore • Stockholm	• Shannon - Ireland • Barranquilla – Colombia • Bataan – Philippines • Kandla - India • Kaoshiung - Taiwan • Masan – South Korea • Penang Island – Malaysia	• Silicon Valley – California • Hsinchu - Taiwan • Austin Incubator - Texas • Tzukuba City – Tokyo		• Aqaba – Jordan • Brest – Belarus • Tianjin – China • Nakhodia - Russia • Shenzhen – China • Vyborg - Russia
	Stage	*First Generation*	*Second Generation*	*Third Generation*	*Fourth Generation*	*Fifth Generation*

Source : Adapted from Meng (2005)

Most early EPZs were established to promote industrialization, primarily through import-substitution (Farole, 2011). However, EPZs have demonstrated ability to evolve because they can adapt functionally to changes in the local, national and international environment. For example, Taiwan and South Korea shifted from import-substituting industrialization in the 1950s to export-oriented industrialization in the 1960s. Import substitution was intended to foster local infant industries by reducing imports, but it could not overcome the lack of financial resources to import intermediate products. Therefore the EPZs were functionally re-oriented to meet the need for export promotion (Chen, 1994) by accelerating labor-intensive manufacturing through exploiting their comparative advantage of cheap labour. The shift from import substitution to export oriented industrialization has been followed by a more recent

trend towards science-based zones and service-based zones. These signalled what we may call third and fourth generation of FEZs, respectively.

Science Based Zone: Third Generation
The science-based zone aims at industrial upgrading by promoting high-tech industries. A science-based zone is an area managed in a manner to promote cutting edge state of the art scientific and technological innovation. It is a physical place supported by university-industry-government collaboration with the intent of creating high technology economic development to help move a country, region or industry or community from a basis of low-cost labour to one of technology. Its main products are computers, related hardware, software and other products.

Incentives such as tax holidays, reduced corporate taxes, duty-free importation of equipment and raw materials and government grants are often provided as part of the entire package to attract foreign and domestic companies to the area. Training programs in the zone produce bodies of specialists in such areas as semiconductors and Optoelectronics that few companies can afford alone. Specialists may share their expertise among themselves, and can apply their skills to problems of more than one company at a time. In addition the parks offer a number of other shared resources, such as reception, management, security, incubators, telecommunication hubs, restaurants, banks offices, convention center, parking, internal transportation, entertainment, sports facilities and so on. In this way, the zone offers considerable advantages to hosted companies.

Science zones provide a good example of how FEZ has evolved in adapting to economic changes in China. As labour costs in the Special Economic Zones rose, the investment environment became overcrowded and the original zones lost some of their appeal to investors (Chen & de'Medic, 2009). This economic pressure, led to the establishment of Economic and Technological Development Zones (ETDZs). These zones are functionally specialized in developing capital- and technology-intensive industries. The zones help the country avoid overdependence on labour-intensive industrialization.

Service Zones: Fourth Generation
In recent years FEZs have expanded to include services. Each Zone can be established as a specialized or for general purpose services. The well-known examples of service zones are tourist and recreational zones, healthcare, academic services, financial services, gambling zones and so on (Pakdeenurit, Suthikarnnarunai, & Rattanawong, 2014). A good example of service based zone is the creation of the Dubai International Financial Centre (DIFC) in 2004 which in just over 10 years has become one of the leading financial centres in the world.

Special Economic Zones (SEZs): Fifth Generation
Since the 1980s, the FEZ concept has evolved further from zones that deal with manufacturing or service or science into the more comprehensive special economic zones (SEZs). A Special Economic Zones is a large-scale FEZ that combines all types of activities trade, manufacturing, service, science and permits on-site residence; it provides a broad set of incentives and benefits that make all these happen. These SEZs are the largest type of all, as they encompass very large portions of a territory, include urban and rural areas, and incorporate large transport facilities such as ports and airports. SEZs can include entire economic regions, the populations that live and work in these regions, and all the economic activities that take place there.

Using this description, Chinese SEZs (including the famous Shenzhen) would fall into this category, as does the Aqaba Special Economic Zone in Jordan (Jayanthakumaran, 2003). It is a recent form of economic zone, originating in China and gaining in popularity. China initiated its open-door policy and economic reforms by introducing Special Economic Zones in 1978. No other SEZ program has had as much impact, nationally and internationally, as the Chinese program. The first zones were established as a test of the controlled restructuring of the entire economy through the introduction of capitalism and foreign investment, after about 30 years of economic and political isolation since 1949. The strategy proved to be successful. China became the world's largest exporter of manufactured goods and the leading recipient of foreign direct investment among emerging economies.

TOWARDS A THEORY OF FEZ - THE LIFE CYCLE

It is important to find an existing or develop a new theory that can provide systematic explanation and prediction of evolution of FEZs. The notion of generality or broad application is important for helping policy-makers design strategies that are appropriate at a particular stage and in anticipation of the next stage of evolution. An examination of the pertinent literature reveals that the city life-cycle theory can be used as a base to discern the main concepts for explaining and predicting the evolution of FEZs. The theory of city life-cycle (Suazer-villa, 1985) says that a city undergoes different stages that include birth, growth, flourishing and decline (Figure 1). At each stage, there are several specific challenges concerning its industrial structure, enterprise structure and spatial structure.

The FEZ Life Cycle

Typical FEZs start (birth) as FTZs by attracting foreign traders who import goods that undergo trade related processes (such as warehousing, storage, sales, exhibition) and light processing operations (such as packaging, labeling, quality control, sorting) and re-exported. If the FEZ authority pursues the right policies the FTZ will experience growth and later on maturity and the inevitable decline. When the FTZ is operating successfully there will be two forces for change: from the host country side and from the source country. The host country may not be content with re-export business and may see an opportunity in creating more local value-added products by attracting foreign manufacturers. On the other hand the source country may be seeking low cost labour to produce labour-intensive products. At this point the interests of the host and source countries coincide; FEZ policies and incentives are likely to change into attracting EPZ firms.

Figure 1: Life Cycle of Free Economic Zones
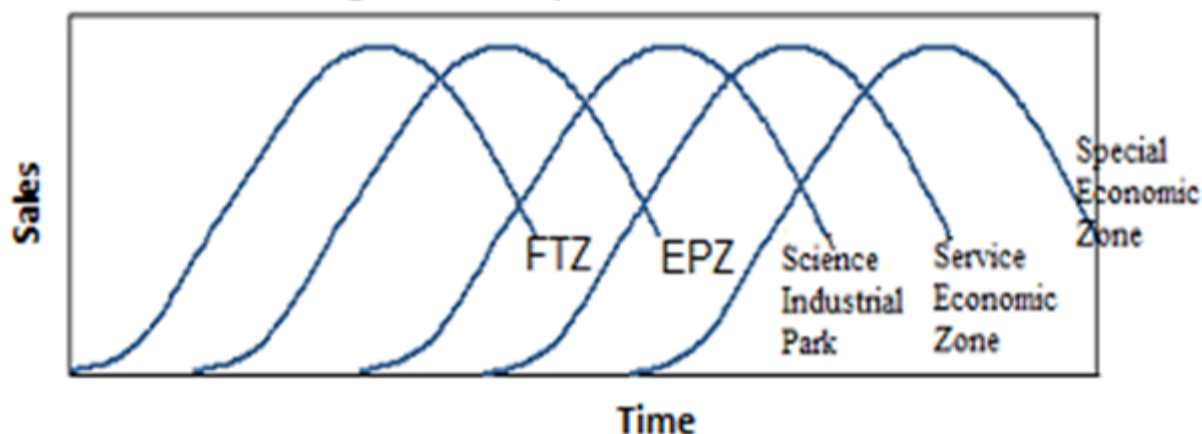
As the EPZ concept is implemented it may lead to growth; but the host country may still want to move from cheap labor-intensive production to more sophisticated technology intensive

higher wage manufacturing. The host government is likely to take an active role in upgrading the technology capabilities of firms in the EPZs. In order to facilitate the transition, forward-thinking developing countries make substantial investment in technology and skills upgrading. The Singaporean government agency for implementing such policy was the Skills Development Fund of the Economic Development, in Malaysia it was the Penang Skills Development Centre, in Taiwan it was the Satellite Relations Program, and in Costa Rica it was the Investment Board (Omar & Stoever, 2008).

Service Zones arise when a country feels that its growth is being restricted by focusing on trade and manufacturing. The country then decides to diversify its free economic zones concept beyond manufacturing to services such as tourism and financial services.

Special Economic Zones arise when a country sees that the concept of zones is restricting its growth in terms of functions and spatial space. This led to the more comprehensive special economic zones (SEZs). A SEZ is a large-scale FEZ that combines all types of activities trade, manufacturing, service, science and permits on-site residence. SEZs can include entire economic regions, the populations that live and work in these regions, and all the economic activities that take place there. One can speculate that the SEZ concept will also reach maturity and at that point one may need to liberalise the whole country or regions to maximise benefits to the country.

Do all FEZs necessarily evolve through the five phases suggested here? There is no one fixed way or format on how the evolution of FEZ should follow. This will to some extent be determined by the specific characteristics of a country such as locational advantages and level of economic development. The sequential approach used in this paper may help a policy maker develop his/her own sequence. Regardless of the specific conditions of a country, it is, however, important that an FEZ planner operate to a theory. This theoretical approach to FEZ evolution is based on the practical experience of other countries and some theory. If used effectively it can be a rapid method to familiarize a policy maker with the analysis of a variety of FEZ situations, predict the next phase and facilitate design of appropriate policies that promote sustainable FEZ development.

CONCLUSIONS, LESSONS AND FUTURE RESEARCH
Conclusions
This study investigated the evolution of FEZs using the functional criteria. The methodology of study involved analysis of the literature. Three main conclusions were revealed by the study about FEZ evolutions:

1. First, the functional typology shown in Table 1 should be treated with caution for it does not include all the variants of FEZs.
2. Second, and most important, the analysis suggests that as FEZs evolve functionally, they engage in more comprehensive activities (trade, manufacturing) and more sectors (services, science, residential issues) with a stronger orientation toward technology and skill intensive manufacturing and services.
3. Third, not all zones necessarily go through all the five stages of FEZ evolution and in the same order. This will to some extent be determined by the stage of economic development of a country and preferences of policy-makers. Regardless of the situation at hand, it is, however, important that FEZ policy-makers appreciate theory. The point is that good FEZ policies involve the joint use of a generally accepted theory as well as judgment skills.
4. Fourth, FEZs are attractive to investors because of the existence of policy failures in the greater host economy: as policy reforms happen investors will see no need for staying

in the FEZs and the relative significance of FEZs in economic terms can be expected to decline; at this point FEZ and non-FEZ firms would be treated equally.

Tentative Guidelines or Lessons
The key findings presented in this paper provide lessons useful to policymakers and practitioners in planning and evaluating zone initiatives. The end result of this paper is a general guideline for zone development, which is intended to optimize results for both host countries and investing firms.

Lesson 1: Start with Trade-Intensive Activities
Historically, the typical FEZs started with entrepot trading activities. There is less risk with this approach for it involves less investment in infrastructure by the host country. As experience in marketing the imported products increases the host country can start manufacturing or assembly of the imported products for export to other markets including to the host country.

Lesson 2: Proceed into Labor-Intensive Manufacturing
It seems that the second step in the development of an FEZ, in a developing country, is normally attracting labor-intensive manufacturing activities that complement and support comparative advantage of the country in question. This step can uplift the skills of the local people, provided that regulatory guidance is used to channel capital inflows to the appropriate sectors. For example, in 1982, in Shenzhen, the SEZ authorities issued strong guidelines to foreign investors on which sectors FDI should focus (FEZ (Farole & Akinci, 2011:198). Small manufacturing (mainly processing and assembly) enterprises in mature industries were set up, based on cheap labour. Mature industries are encouraged because they use an already established technology and hence can be manufactured by lower skilled labour. In this situation, the less developed countries may be able to undersell the more advanced countries by applying their less-skilled cheap labour to the technology already designed to product.

If the firms in the FEZs focus on industries in which the country has comparative advantage, it increases the likelihood of the local economy capturing the spill-overs from foreign direct investment. This can happen by creating zone linkages with the local economy through integrating local raw materials and intermediate inputs. In fact one of the reasons for failure of several African zones has been identified as the tendency to become enclave economies, without development of backward and forward linkage with industries with the local economy("Centre for Education and Documentation," 2009). In fact, as long as the industries that are licensed to operate in the Zones are those in which the country has comparative advantage, a natural incentive for local firms to sell goods and services to zone-based companies develops because such sales are regarded as exports and therefore eligible for export incentives.

Lesson 3: Upgrade into Technology-Intensive Manufacturing
The third step in developing FEZs is gradually transitioning from low-end cheap labour-intensive manufacturing to higher-end technology-intensive manufacturing. This process should be gradual in view of the fact that technological competences take time to build up. In the case of Shenzhen, the transition to high-end technology-intensive manufacturing was brought on naturally and by regulation. Two natural factors were in operation - the cost of land went up making it no longer a place for labour-intensive manufacturing industries and the need to differentiate because of increasing competition from other FEZs. Through regulations the government deliberately enacted strong laws protecting intellectual property rights. In the case of Taiwan, the transition to high-end technology-intensive manufacturing was done mainly through government regulation: new garment industries were not allowed in Taiwan's

EPZs as of 1974 (Farole & Akinci, 2011:200).

Lesson 4: FEZs are a Transitory Policy Instrument

FEZs are attractive to investors because of the existence of policy failures in the host country. As liberalization continues, investors will see no need for staying in the FEZs and the relative significance of FEZs in economic terms can be expected to decline. Thus, a country's export-led growth strategies cannot rely solely on FEZs to achieve higher levels of economic growth in the long-term. A country should acknowledge the transitional nature of FEZs, and manage wisely the opportunities they may bring to upgrade labour and managerial skills, acquire superior technology and access foreign markets. In other words, FEZ should be a part of a more extensive package of policies aimed at improving the international competitiveness (Jenkins, Esquivel, & Felipe, 1998). Successfully incorporating FEZs into the national economy requires periodic revisions of the FEZ regulations to accommodate changing national economic conditions. As the goals and roles of FEZs shift, many of the incentives will have to change. For best results there is need to change FEZ regulatory policies to support their natural and desired evolution into the next stage.

A good example of transition is the EPZs in Taiwan that have become less necessary in recent years as the total economy is almost completely reformed. In China, FEZs are still necessary because the Chinese economy is not completely reformed. This implies that establishing an export processing zone in an economy that has already reformed its macroeconomic policies is not recommended on the ground that low FDI flows may be due to inadequate legal or regulatory framework on important areas such as property ownership or labour laws. After all FEZs are not the first best policy option for development for they distort economic development and re-introduces an element of discretion into the policy environment. This implies that FEZ policy and domestic reforms should be formulated so that eventually the same treatment applies to all firms.

SUGGESTIONS FOR FUTURE RESEARCH

The functional criterion for classification employed in this study provides a natural guide to future research. This study focused on the type of industry or activity to classify FEZs. This begs the question "what other criteria or dimensions" could be used to classify FEZs? During the course of this research, two other criteria for classifying FEZs were implied as discussed below.

1. Future researchers may consider studying and classifying FEZs on the basis of their spatial location. FEZs are found in various locations including: coastal versus inland, urban versus rural, intra-national versus cross-border regions. One may investigate FEZ locations with a view to discover common location patterns and common characteristics of the locations such as a high degree of accessibility.
2. This study was literature based. It involved extensive literature review on several experiences of FEZs from various countries. Future researchers could conduct an empirical survey study on many FEZs on a topic such as "identification and ranking factors influencing the evolution of free trade zones".
3. Another similar study could follow the case method approach by carrying out an intensive study of a relatively small number of FEZs or a single FEZ. The case(s) should be helpful in providing detailed and in-depth understanding on the factors that influence the evolution of a FEZ. Case studies which demonstrate the way in which successful FEZs evolved over time may be a useful starting point.

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Exploring the Effect of Frictional Heat on Rate of Fuel Combustion by ICE through Modeling and Simulation with Reference to ICE Parameters.

Motey Festus

Dr. Essel Ben Hagan

ABSTRACT

Otto cycle operations of ICEs have relatively higher capacities and efficiency. Factors of efficiency, emission, fuel consumption and output power are considered during design and construction of ICEs. Engine size, engine weight, number of pistons, swept volume, cylinder arrangement and number of valves all differs in accordance to type of ICE. Fundamental principle of ICE is burning of air – fuel mixture of appropriate proportions in air tight chamber to produce heat energy for motion. Fossil fuel of diesel and gasoline obtained from underground are the main fuels used by ICEs. The engine block houses cylinders, pistons rings, connecting rods and pistons. At top seals of cylinders are located inlet valves, outlet valves and channels. Crankcase houses crankshaft and bearings whiles the sump serves as reservoir for lubrication oil. Lubrication oil also known as lubricant reduces friction between moving surfaces in ICEs through piston ring grooves. Connecting rod is the linkage between crankshaft and piston. Gudgeon – pin transmits combustion force from piston to connecting rod then to crankshaft. Thus, crankshaft converts reciprocating motion of piston to cyclic motion. During operations of ICEs, friction occurs between pistons with piston rings collectively and inner walls of cylinder. Frictional effects account for about thirty five percent (35%) of total heat generated in ICEs. The methodology adopted by this article is modeling and simulating frictional models by previous authors. These models were incorporated with ICE parameters before modeling and simulation again. Objectively, graphical results show reduction in heat generation due to friction.

Key words: Blowby, Lubricant, Friction, Combustion, Simulation.

NOMENCLATURE

BDC or ODC	Bottom Dead Center
HDDE	Heavy Duty Diesel Engine
ICE	Internal Combustion Engine
PRCL	Piston Ring Cylinder Liner
TDC or IDC	Top Dead Center

INTRODUCTION

The ratio of power to weight is far higher when using the Otto cycle principle as compared to capabilities of steam engine operations. Relatively, the Otto cycle have better capabilities in terms of operations and efficiency when used for a lot of transportation applications like aircraft, vehicles, among others. The four stroke Otto cycle engine produced by Karl Benz has led to the development of more powerful ICEs, particularly for automobiles such as trucks, buses and cars. Heavy weight diesel engines are normally used in trucks and buses. Relatively, the four stroke Otto cycle light weight gasoline ICEs are mostly used in automobiles such as cars. Ganeshan, (2012). During the design and construction of the automobile engines, factors such as efficiency, emissions and affordability are taken into consideration. These engines have varieties of power ratings, thus from low power output to very high power output values.

There are also variations in engine size, weight, number of cylinders, volumetric displacement, cylinder arrangements and valves. Livanos and Kyrtatos, (2006).

The fundamental principles of ICE is the exclusive burning of fuel in fluid form in a confined chamber with oxygen. Normally, the liquid fuels that are burnt during the combustion in ICEs are gasoline or petrol and diesel. Air - fuel mixture in the right quantities are introduced and compressed in the combustion chamber before igniting to burn. Tamminen, Sandstroma and Anderson, (2006). This internal combustion results to release of heat energy at high gas pressures which is useful for forcing the piston to move along the stroke length in cylinder. This is useful mechanical work resulting from internal combustion. Piston energy is transmitted by connecting rod to crankshaft. The objective of this research or article is to analyze frictional heat effect on rate of fuel consumption through modeling and simulation with reference to engine parameters such as piston diameter, number of piston rings, number of pistons and weight of connecting rod. Rupp, (2009).

REVIEWED LITERATURE
Engine Structure and Functions
The cylinder or engine block is a structure obtained from casting. This block has bores which serve as control for working gases, provides support for piston as well as piston rings. The block also houses channels or galleries through which coolant flows. The top of combustion chamber is enclosed by cylinder head and this is also top of cylinder block. This head houses inlet valves, outlet valves, inlet ports and other fluid channels. Crankcase is produced from casting. Functions of crankcase are housing and supporting crankshaft as well as bearings. Crankcase is also mono – constructional structure casted with cylinder block. This structure is produced from casting of steel or aluminum alloy. Sahoo, (2011).

The sump serves as reservoir that accommodates lubrication oil. Lubricating oil or lubricant is pumped from sump to moving metal surfaces in contact to reduce friction. Piston functions by converting pressure from very hot gases to concentrated forces of driving at connecting rod. Thus, the piston is a plunge which is cylindrical in shape and pressure tight. Repeated up and down motion of piston is referred to as reciprocating motion and it is linear motion. The gaps or spaces between inner cylinder walls and outer surface walls of piston are sealed by special circular rings called piston rings. These rings function by stopping the movement of gases and lubricant between these walls. Mufti, (2004). The gudgeon pin is responsible for transmission of force or pressure from piston to connecting rod small end. This pin allows rotational or cyclic motion of crankshaft. Connecting rod transmits linear motion of piston to crankshaft. Crankshaft converts linear motion to cyclic motion. This crankshaft is made of circular – sectional shaft that is cranked or bent into two right angled crank – arms as well as an offset big end journal. The main journal is unbent section of this crankshaft. Priest and Taylor, (2002). Connecting rod serves as linkage between crankshaft and piston. This linkage caters for conversion of linear reciprocating motion to circular or rotary motion. Crankshaft journals are finished cylindrical pins that are machined parallel on central as well as offset axes of crankshaft. These journals rotate in bearings mounted in main journals or crankcase as well as the big – end journal or connecting rod. Karkamkar, (2013). There exist hinged joint by gudgeon – pin between piston and connecting rod which is known as small – end. This small – end enables connecting rod to oscillate relative to cylinder axis and reciprocating cylinder motion.

Big – end enables relative angular motion. Rubbing pair occurs between crankshaft main journal and their corresponding plain bearings that are mounted in crankcase. Line stroke is at center path which piston is compelled to follow as a result of constraints of cylinder. The piston

is at either one of it's two positions of extreme if connecting rod and crank arm are aligned along line of stroke. When piston is at closest point or location to cylinder head, then piston and crank are at IDC or TDC. However, if piston is at longest distance away from cylinder head, then both crank and piston are at ODC or BDC. Sandoval and Heywood, (2003). These reference centers are useful for ignition settings leading to valve crankshaft timing. Clearance volume or combustion chamber space is the allowance or space between piston crown at TDC and cylinder head. Crank – throw is distance from center of big – end journal to center of crankshaft main journal. Piston stroke is distance covered or movement from IDA to ODC. Piston stroke is equivalent to half crankshaft rotation or twice crank – throw or one hundred and eighty (180) degrees. Sand scores which occupy cylinder spaces of engine block are used to cast cylinder bore. These bores are machined to be smooth after sand scores are removed which includes boring. Cho, Choi and Bae, (2000).

Friction and Heat Generation
ICEs or automobile engines experience losses of mechanical energy due to friction between inner cylinder walls and piston as well as piston rings. High application of HDDE in the transport industry makes it interesting researching into it's efficiency. Approximately, only about fourty percent (40%) of fuel energy is utilized by HDDE as mechanical power for motion. The rest of fuel energy content is lost through friction, thermal energy resulting from friction, among others. Bedajangam and Jadhave, (2003).

Highest of these losses occur due to frictional effect between inner cylinder walls and piston with piston rings. This frictional effect results to heat generation within ICEs. Reduction of this friction will result to reduction in fuel consumption, specifically diesel consumption as well as increase in efficiency of ICE or HDDE. Normally, PRCL pack has three (3) piston rings but some relatively bigger ICEs have four piston rings. Law, (2007). Each of these piston rings has their respective shapes in - accordance to their functions. These piston rings are made from cast iron and identified as upper compression ring, lower compression ring as well as oil control ring. Upper compression ring is coated with electrochemical chromium on the running surface in order to resist wear and tear. Herst, (2007). After casting, surfaces of these piston rings are accurately smoothen by horning process. There are grooves on piston rings which function by controlling the quantity of lubricant required to reduce friction. Another function of piston rings is to prevent flow of debris so as to protect smooth surfaces from scratch and damage. The function of upper compression ring is to seal unwanted spaces between inner cylinder walls and piston as well as piston rings. Additional sealing and scraping of lubricant flowing downwards are functions of lower compression ring. Zoz, Strepek, Wiseman, and Qian, (2001).

The oil control ring works as main barrier or blockage between starved lubricated region of ring belt and well lubricated piston skirt area. Increasing contact temperature in spaces and lubricant velocity are to a large extent been influenced by temperature of cylinder liner. Along axial length of cylinder liner, increasing cylinder temperature varies between ninety and two hundred (90 and 200) degree celsius. Lubrication regime and pressure of spaces varies along cylinder liner. Blowby and oil consumption, wear as well as frictional power losses are most important factors to be considered for reducing frictional effects on PRCL contact in ICEs. Zammit, (2013). Overall efficiency will improve upon lowering of above factors. Combustion gases which flow from combustion chamber and by pass piston rings will enter crankcase. As a result, these gases will cause power losses as well as lower efficiency and are referred to as blowby. Piston motion occurs many times per second which is an indication that high losses occur during ICE operations. Conditions of proper ICE operations will have gases strictly confined to combustion chamber whiles lubricant is restricted to it's galleries and sump. Space

between ring groove and flank of ring can be channels for blowby. Reducing blowby results to reducing volumetric power losses. This research is conducted for all regimes of lubrication. Yildiz, Annaswamy, Yanakiev, and Kolmanovsk, (2010).

METHODOLOGY

The methodology adopted for this research is modeling and simulation. The models are mathematical representations of operations or parts of ICEs. Matlab is the tool which contains modeling and simulation. When this tool is opened, modeling command window also opens. This command window contains tools for modeling. Also, modeling involves writing of matlab programs using parameters of specific models. Thus, these variables or parameters and constants of models must be the only variables as well as constants to be used in programming. Modeling begins with writing of topic or title which reflects on objective of model. Samhaber, Wimmer and Liobner, (2012). Next step of line is to write mathematical equations or expressions of models. These models are picked from literature of previous authors that are closely related to this research. These models are rewritten or revised by addition of more parameters or variables so as to cause changes in trends. Next lines of matlab programming are made of comments of definitions or explanations of terms that are used in equations or models. These comments are identified or begin with percentages (%) which are assumed to be ignored by programs. After this, next set of lines consists of model variables equated to their respective constant values. Guzzella and Onder, (2010).

These constant values are obtained from literature of previous similar researches. Next line is made of independent variables been equated to their value ranges. On next step of line is the new independent variable which will alter this model for improvement. Subsequent lines contain equations of models from literature and modified versions respectively. Specifications of plot graph parameters such as axis labels, title of graphs and graph line legends or identifications are contents of next lines sequentially. Click on run icon to show graphs automatically. A resultant graphical line is obtained with dependent variable on vertical axis and independent variable on horizontal axis. Gilat, (2004).

At top of matlab program window is an extra toolbox which is referred to as simulink. Thus, simulink is one of the programs that run in matlab. Act of running simulink program is known as simulation. When the word simulink is typed and enter key is pressed, simulink window opens. Alternatively, simulink icon on top of matlab window can be clicked for simulink window to open. Simulink library browser will open in this window which contains main simulink block libraries as well as additional blocksets. Meyer, (2007). These libraries and blocks contain simulink blocks which are commonly used, continuous, discontinuities, discrete, logic and bit operations, lookup tables, math operations, model verification, model – wide utilities, ports and subsystems, signal attributes, signal routing, sinks, sources, user – defined functions, additional math and discrete as well as neural network toolbox blocks. These blocks are clicked on and dragged into a new window in – accordance to type of equations. Tan and Ripin, (2011). Double clicking on each of these blocks will lead to opening of function block parameters of each of these blocks. These function blocks have specific spaces for which values of parameters will be entered for model specifications. Click on "OK" to close the function block parameters. To connect blocks, click on output of earlier block and drag it to input of block to be connected or ahead. Step block is overall input and scope gives overall output graph when double clicked. Samhaber, Wimmer and Liobner, (2012).

EQUATIONS

Brake Mean Effective Pressure

Equation 108

$$bmep = \frac{P \times z}{V_d \times n}$$

Source: Kanne, 2000.

The equation above represents a model for brake mean effective pressure of ICE.
Where
V_d = Displaced cylinder volume
s= n = Rotational speed
z = Number of crank revolutions per power stroke
P = Power of engine.
Burn Fraction Variation

Equation 109

$$X_b(\theta) = 1 - exp.\left[-a\left(\frac{\theta - \theta^n}{\theta^d}\right)\right]$$

Source: Karkamkar, (2013).

This equation above is a model for determining the fraction of unburnt fuel.
Where
$X_b(\theta)$ = burn fraction as a function of crank angle
θ = crank angle
θ_s = spark timing
θ^d = duration of heat release
n = Weibe form factor
a = Weibe efficiency factor
$\qquad a = 5$
$\qquad n = 3$

$$\theta_s = {-pi}/{a}$$

Load Dynamics

Equation 121

$$P_b(n) = K_b n^3$$

Source: Amini, Mirzeai Khoshbakhti Saray, (2013).
This equation above is a model for engine load.
Where:
K_b = engine load
n = engine speed RPM
P_b =
A = age
V = velocity
Mass Flow Rate

Equation 122

$$m = DM\frac{1}{B}aA$$

Source: Martinez, Samchez, Bermudex and Riesco-Avila, (2010)

Equation (122) one hundred and twenty two above is a model for the mass flow rate of fuel.
Where
V = velocity
A = frontal area
a = sonic velocity
P = pressure
B = bore diameter
Piston Velocity

Equation 129

$$V = S/_2 \cos\theta + (C^2 - S/_2 \sin\theta)^2$$
Source: Saris and Philips, (2005).

Equation (129) one hundred and twenty nine above is a model for piston velocity of ICE.
Where
V = piston velocity
C = rolling resistance constant
S = stroke length
T = engine temperature
θ = crank angle of piston
Rolling Resistance

Equation 130

$$R_r = 9.8066 \times C_r \times (C_2 V + C_3) \times \frac{M}{1006}$$
Source: Yue, (2008).

Equation (130) one hundred and thirty above is a model representing aerodynamic resistance.
Where:
R_r = rolling resistance (N)
M = vehicle mass
V = vehicle speed
C_r, C_2, C_3 = rolling resistance constants

MODELING OF THE EQUATIONS
Matlab Program for Equation (108) One Hundred and Eight.

```
%MODELING FUEL CONSUMPTION REDUCTION IN TERMS OF THERMOMANGEMENT
%BRAEK MEAN EFFECTIVE PRESSURE
%_____
function brakemeaneffectivepressure(bmep)
%brake mean effective pressure=bmep
%bmep=(p*z/(vd*s)
%brake mean effective pressure with reference to N = bmep1
%bmep1=((p*z)/vd*s)/N
%where
%N=connecting rod weight
```

```
%s=rational speed
%z=number of brake revolutions per power stroke
%p=power of engine
%vd=displaced cylinder volume
N=35;
p=80;
z=55;
vd=100;
s=0:2:1000;
bmep=((p*z)/vd.*s);
bmep1=((p*z)/vd.*s)/N;
plot(s,bmep,s,bmep1)
xlabel('s (rev/sec)');%-axis label
ylabel('bmep/bemp1');%y-axis label
legend('((p*z)/vd.*s)','((p*z)/vd.*s)/N');
title('BRAEK MEAN EFFECTIVE PRESSURE')
end
```

The equation" bmep" has been modified to "bmep1" by this research by incorporating N.

Matlab Program for Equation (109) One Hundred and Nine

```
%SPARK TIMING ON COMBUSTION
%BURN FRACTION VARIATION
%_____
function burnfractionvariation(xb)
%xb = 1 - exp(-a*(theta - thetas/thetad)^n)
%xb1 = burn fraction variation with reference to H
%xb1 = 1 - exp(-a*(theta - thetas*T/thetad)^n)*H
%where
%theta = Crank angle
%thetad = Duration of heat release
%thetas = Spark timing
% Xb is the burn fraction as a function of crank angle,
% n is the Weibe form factor
% a is the Weibe effeciency factor
% H is number of pistons
n = -5.9;
H = 7;
a = 5;
thetad = 30;
thetas = 13.7;
theta = 0:2:60;
xb = 1 - exp(-a*(theta - thetas/thetad).^n);
xb1 = 1 - exp(-a*(theta - thetas/thetad).^n)*H;
plot(theta,xb,theta,xb1)
xlabel('theta(deg)');%x-axis label
ylabel('xb/xb1');%y-axis label
legend('(1-exp(-a*(theta-thetas/thetad).^n)','(1-exp(-a*(theta-
thetas/thetad).^n)*H)')
title('BURN FRACTION VARIATION')
end
```

The equation for "xb" has been modified by this research to "xb1" by incorporating H.

Matlab Program for Equation (121) One hundred and Twenty One.

```
%%OPTIMIZATION OF CONTROL LAW FOR AIR FUEL RATIO
%LOAD DYNAMIC
%_____
function loaddynamic(pbn)
%load dynamic(pbn)=pb*n^3
%load dynamics with reference to J = pbn1
%pbn1=pbn.*J*n^3
%J=number of piston rings
```

```
%pb= engine load
%n= engine speed (RPM)
J=6;
n=0:15:350;
pb= 55;
pbn=pb.*n.^3;
pbn1=pb.*J*n^3;
plot(n,pbn,n,pbn1)
xlabel('n');%x-axis label
ylabel('pbn/pbn1');%y-axis label
legend('(pb.*n.^3)','(pb.*J*n^3)')
title('LOAD DYNAMIC')
end
```

Equation "pbn" was remodeled by this research to form equation "pbn1" by multiplying or incorporating J.

Matlab Program for Equation (122) One Hundred and Twenty Two.

```
%MODEL FOR COMPRESSIBLE FLOW
%MASS FLOW RATE
%_____
function massflowrate(MFR)
%mass flow rate (fuel) = MFR
%MFR=D.*M*1/B*a*A
%mass flow rate (fuel) with reference to N = MFR1
%MFR1=D.*M*1/B*a*A/N
%where
%D=density of engine
%B=bore diameter
%M=mass of the fuel
%A=frontal area
%a=sonic velocity
%M=much number
%N=connecting rod weight
N=4;
a=98;
D=36;
M=0.1:3:150;
B=83;
A=8.55;
MFR=D.*M*1/B*a*A;
MFR1=D.*M*1/B*a*A/N;
plot(M,MFR,M,MFR1)
xlabel('M');%x-axis label
ylabel('MFR/MFR1');%y-axis label
legend('(D.*M*1/B*a*A)','(D.*M*1/B*a*A/N)')
title('MASS FLOW RATE')
end
```

The remodeling of equation "MFR" by this research involves incorporating N to form the equation MFR1.

Matlab Program for Equation (129) One Hundred and Twenty Nine

```
%FLUID CHARACTERISTIC MODELING IN ICE
%PISTON VELOCITY
%_____
function pistonvelciity(y)
%piston velocity = y
%y=S/2*costheta+(C^2-S/2*sintheta)^2
%piston velocity interms of N = y1
%y1=(S/2*costheta+(C^2-S/2*sintheta)^2)*N
%where
%theta= crank angle of piston
%S=stroke length
```

```
%N=connecting rod weight
%C=rolling resistance constant
N=35;
costheta=10;
sintheta=12;
C=35;
S=1:2:53;
y=S./2*costheta+(C^2.-S/2*sintheta).^2;
y1=S./2*costheta+((C^2.-S/2*sintheta).^2)*N;
plot(S,y,S,y1)
xlabel('S(m)');%x-axis label
ylabel('y/y1');%y-axis label
legend('(S./2*costheta+(C^2.-S/2*sintheta).^2)','(S./2*costheta+((C^2.-
S/2*sintheta).^2)*N)')
title('PISTON VELOCITY')
end
```

The equation "y" has been remodeled by this research to form equation "y1" by incorporating N.

Matlab Program for Equation (130) One Hundred and Thirty.

```
%MODELING OF FUEL CONSUMPTION IN TERMS OF ENGINE
%MODEL FOR ROLLING RESISTANCE
%----------------------------------------
function rollingresistance(Rr)
%Rolling resistance = Rr
%Rr=9.8066*Ca*(Cb*v+Cc)*M/1000
%Rolling rsistance with reference to N = Rr1
%Rr1 = (9.8066*Ca*(Cb*v+Cc)*M/1000)*N
%where
%N=connecting rod weight
%Ca=rolling resistance constant
%Cb=rolling resistance constant
%Cc=rolling resistance constant
%v=vehicle speed
%M=vehicle weight
%Ca, Cb, Cc = rolling resistance constant=45
Ca=45;
Cb=45;
Cc=45;
N=35;
M=300;
v=15:5:250;
Rr=9.8066*Ca*(Cb.*v+Cc).*M/1000;
Rr1=9.8066*Ca*(Cb.*v+Cc).*M/1000*N;
plot(v,Rr,v,Rr1)
xlabel('v(m/s^2)');%x-axis label
ylabel('Rr,Rr1');%y-axis label
legend('(9.8066*Ca*(Cb.*v+Cc).*M/1000)','(9.8066*Ca*(Cb.*v+Cc).*M/1000)*N')
title('ROLLING RESITANCE')
end
```

The modification of equation "Rr" by this research was done by incorporating N to form the equation "Rr1".

SIMULATION OF THE EQUATIONS

Simulation scheme for equation 108
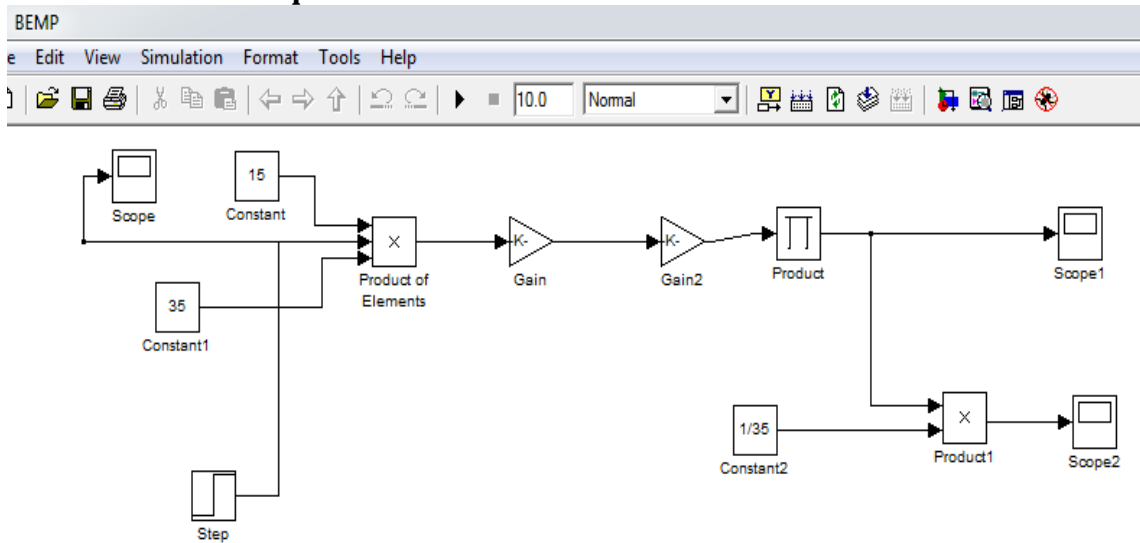
Simulation scheme for equation 109
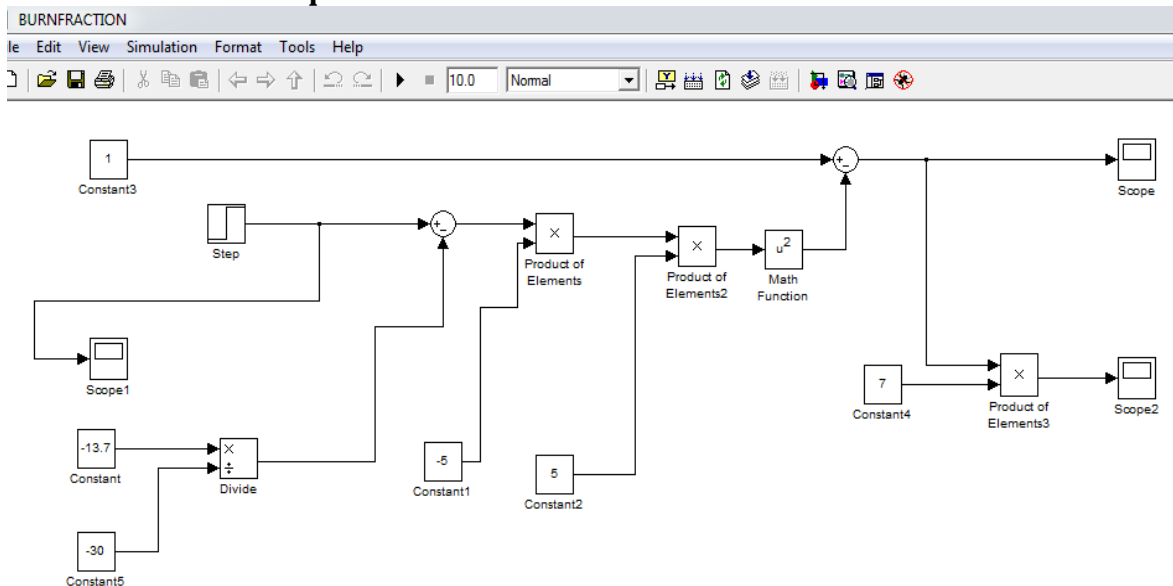
Simulation scheme for equation 121
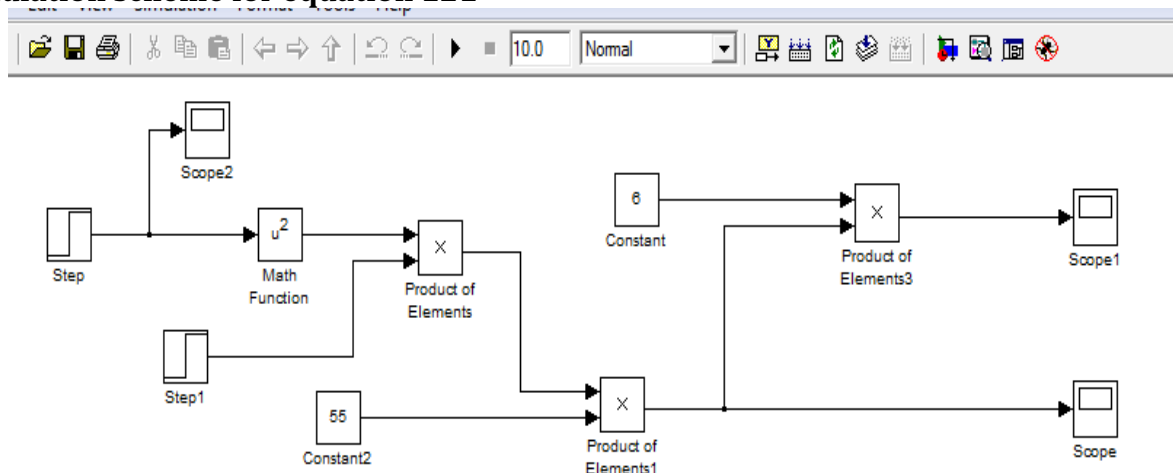
Simulation scheme for equation 122
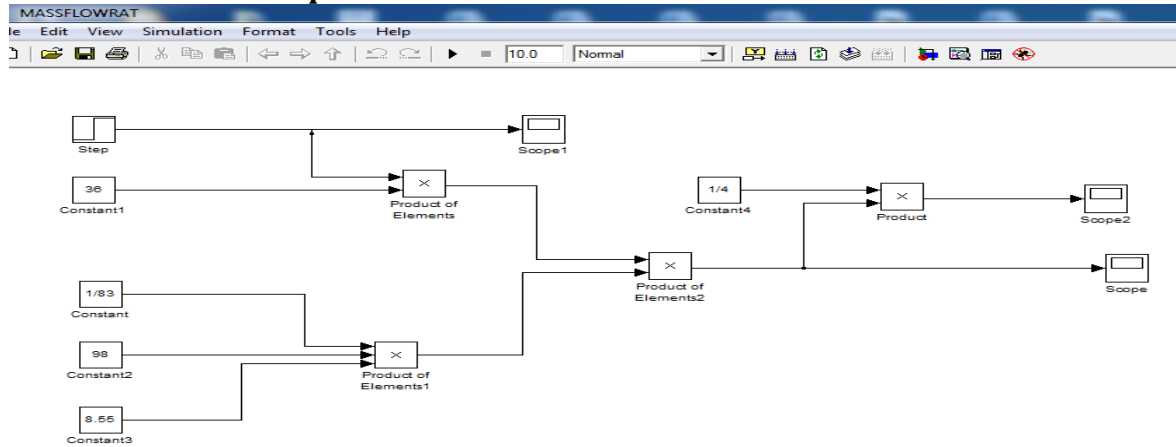
Simulation scheme for equation 129
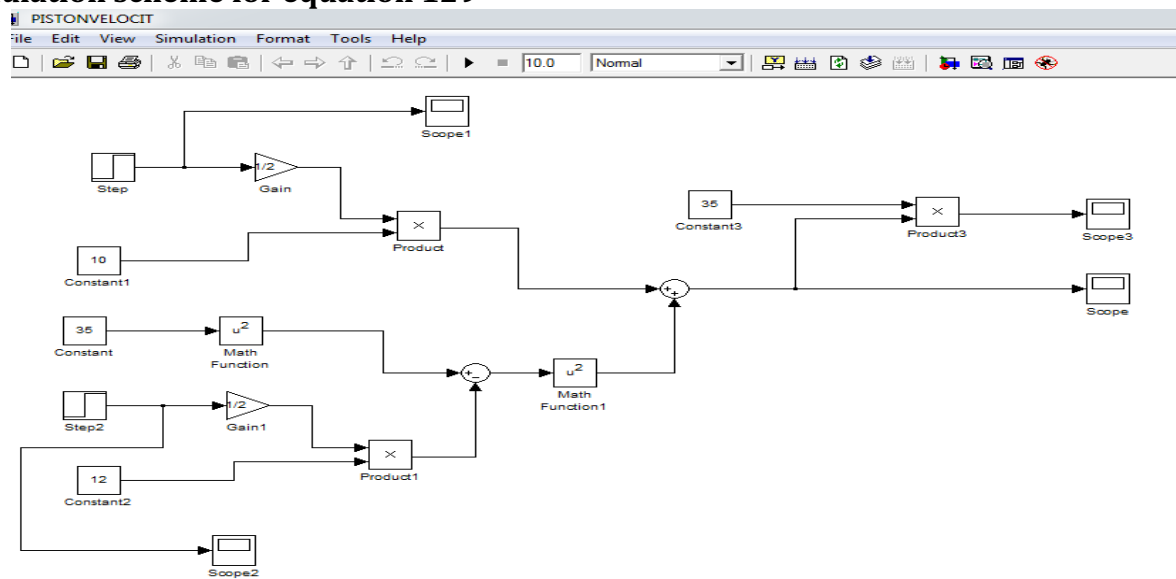
Simulation scheme for equation 130
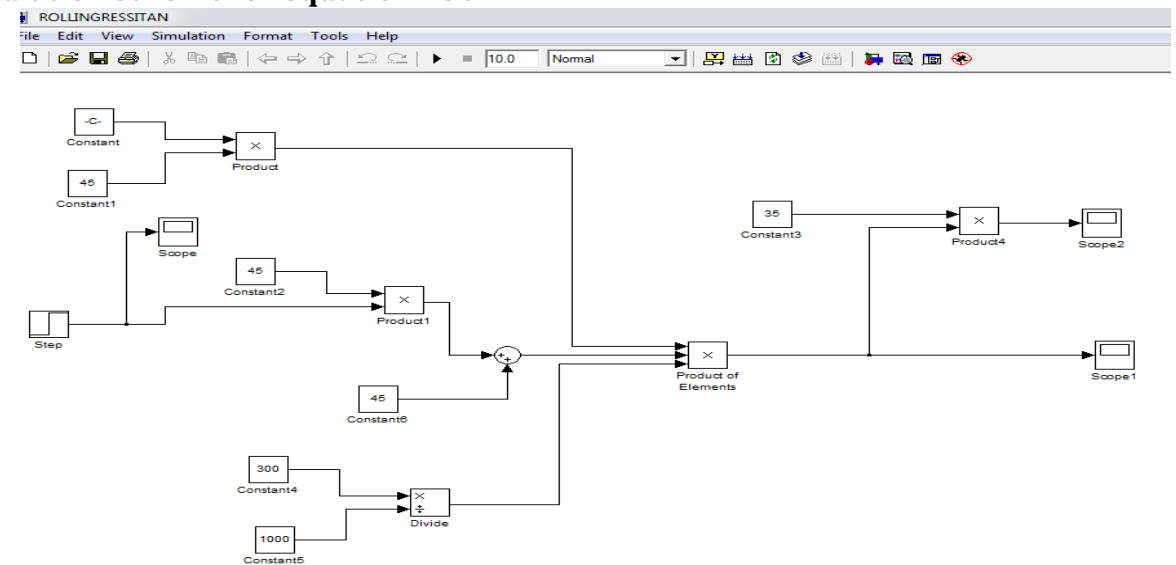
MODELING RESULTS
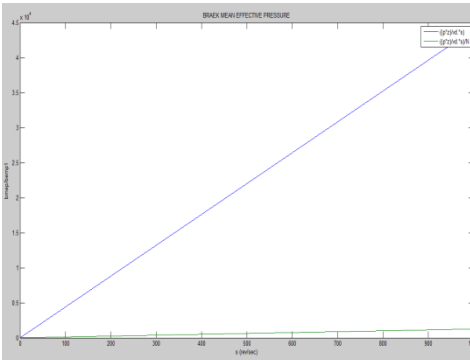
Modeling results for equation 108
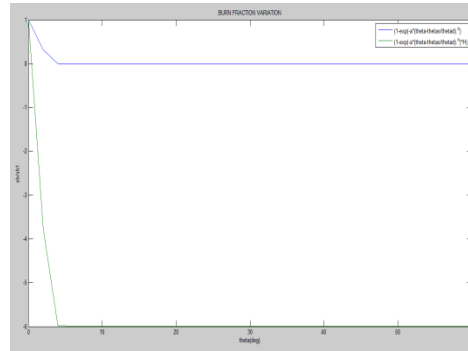
Modeling results for equation 109
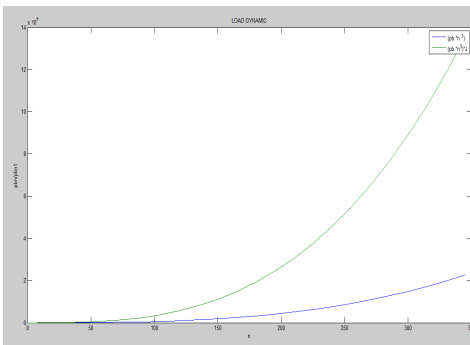
Modeling results for equation 121
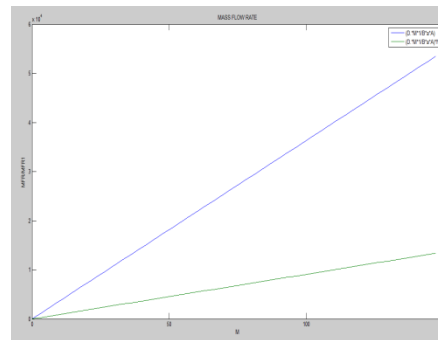
Modeling results for equation 122
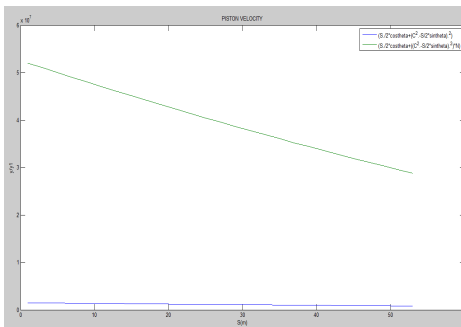
Modeling results for equation 129
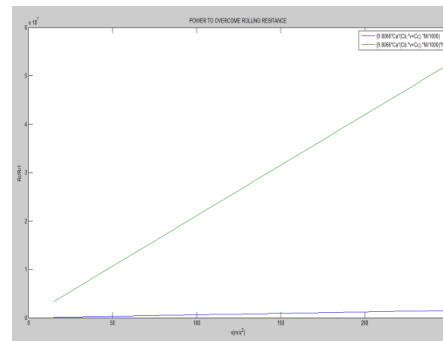
Modeling results for equation 130

SIMULATION RESULTS
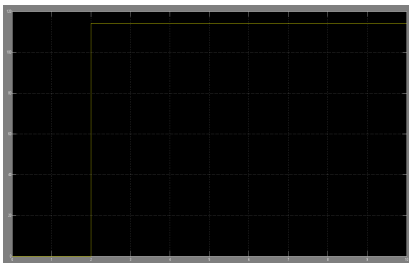
Simulation results i for equation 108

Simulation results ii for equation 108
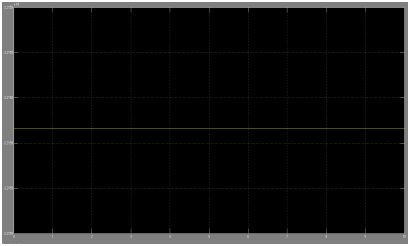
Simulation results i for equation 109
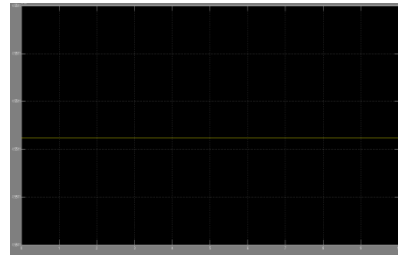
Simulation results ii for equation 109
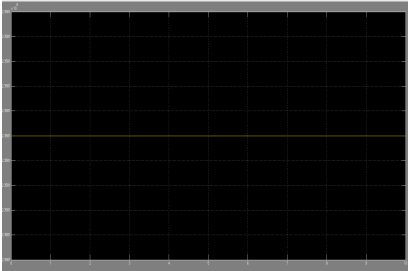
Simulation results i for equation 121
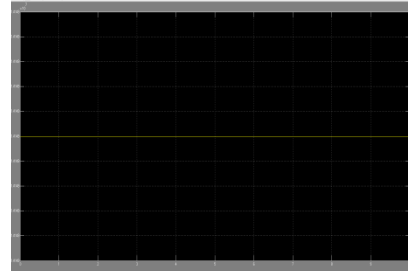
Simulation results ii for equation 121
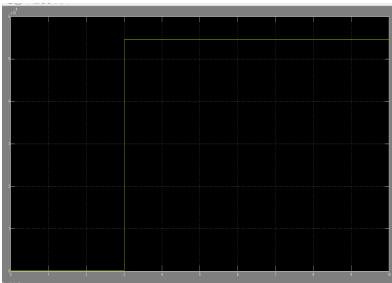
Simulation results i for equation 122
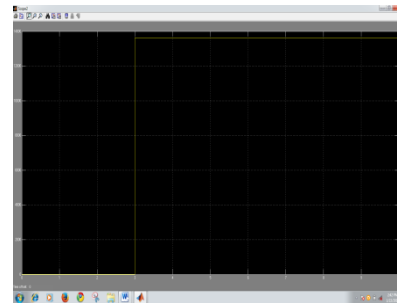
Simulation results ii for equation 122
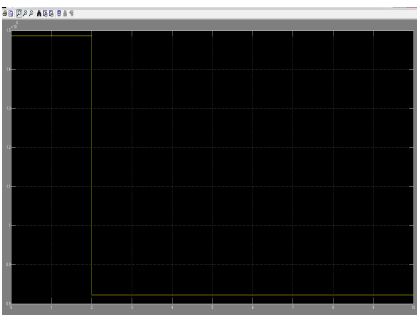
Simulation results i for equation 129
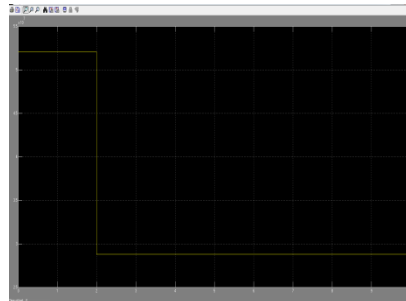
Simulation results ii for equation 129
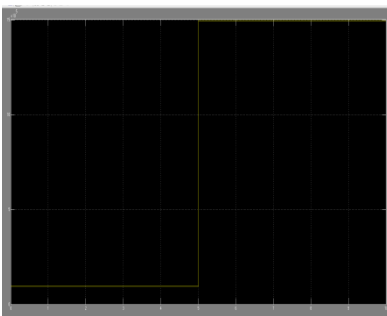
Simulation results i for equation 130
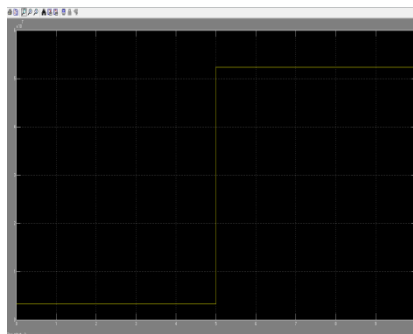
Simulation results for equation 130

ANALYSIS OF RESULTS

Incorporating the ICE parameter values of piston diameter, number of piston rings, number of pistons, engine temperature and weight of connecting rod into the equations during modeling as well as simulation will give graphical results above. Thus, by these analyses frictional heat produce has reduced resulting to improvements in equations mentioned below. Blue lines of modeling results represent outcomes of previous authors' models whiles green lines represent remodeling with inclusion of these parameters.

As a result of reducing frictional heat by this research, the following deductions were arrived at. Thus, for equation 108 the relative mean effective pressure available has decrease which has practical implication that more power is available for motion as well as to reduce frictional heat generated. The practical implication is that rate of fuel consumption will reduce. All other conditions been equal, remodeling of equation 109 indicates frictional heat was reduced resulting to less fuel been combusted. This means policy for lesser fuel consumption is achieved whiles practically combustion rate is reduced for the same work done. Equation 121 shows that after remodeling, with the same quantity of fuel more power is produced to overcome load and pressure, thus frictional heat has been reduced in this friction model. Resulting remodeling graph for equation 122 indicates that less quantity of fuel flows for combustion, hence less fuel consumption. This is because frictional heat has been reduced after remodeling the equation. Parameter remodeling of equations 129 and 130 indicated that frictional heat was reduced and more power was produced for piston motion as well as to overcome rolling resistance respectively. Therefore, engine efficiency has been improved.

Simulation result ii for equation 108 shows increase in relative mean effective pressure which will result to lower heat generated by friction and relatively less fuel consumption. Result ii for simulating equation 109 indicates less fuel combustion which implies lesser frictional heat generation. Graph for result ii for simulating equation 121 indicates more combustion power was produced to overcome load and reduce frictional heat effect. Simulation result ii for equation 122 revealed less fuel flow resulting to less frictional heat generation. Result ii for simulating equations 129 and 130 indicated more combustion power for piston motion and rolling resistance respectively so as reduce frictional heat generation.

CONCLUSION AND RECOMMENDATION.

Heat generation due to internal combustion processes contributes towards rising rate of fuel consumption by internal combustion engines. The parameters mentioned in this research must be incorporated to reduce heat as well as rate of fuel consumption.

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Corporate Social Responsibility and Culture: The case of the largest Greek Commercial Bank.

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ABSTRACT
Throughout the years, the banking sector has encountered many challenges and undergone numerous changes in an effort of keeping up with international expectations, regulatory initiatives and competitive pressures. On the one hand, banks have been diversifying their activities in pursuit of customising their services to industries' needs to increase their risk resilience and secure their marginal returns. On the other hand, they have been engaging in investments within the wider field of Corporate Social Responsibility (CSR). The underlying value proposition of this mandate rests upon facilitating and further strengthening mutually beneficial relationships with the society while recognising the delicate balance and preservation of the natural environment. In this direction, many banks in the last decades tried to ensure their image through investments in the field of culture. The present research explicates the manifestation and operationalisation of CSR through investment realised for cultural objectives as part of the social aspect business responsibility. As such, we shift attention towards practices applied worldwide by the banking sector with respect to museums. Furthermore, we abide by a single case study approach and investigate the business model of the Cultural Foundation of Piraeus Bank (CFPB) as a CSR practice. Piraeus Bank is the largest commercial bank in Greece and CFPB constitutes a unique paradigm worldwide, since the bank not only contributes to the establishment of the museum in line with the majority of other banking initiatives that witness support through sponsorships but it is also actively engaged in its ongoing operations. The network of CFPB includes currently nine thematic museums in several locations throughout Greece. In light of these, we present how CFPB aligns and realises its activities in terms of financing, relationships between its network of museum with local communities as well as the promotional strategies deployed. Finally, we also discuss on potential future research avenues and implication derived for both academia and practice.

Keywords: Corporate Social Responsibility (CSR), Banking Sector, Culture, Museums

INTRODUCTION
From the midst of the 20th century, CSR has grown significantly as a field of practical and academic attention and has been accompanied by a proliferating terminology (Garriga and Melé, 2004). Consequently, it presents itself as a main determinant of the financial sector (De la

Cuesta et al., 2006) and has spurred interest across banks due to the industry's potential through innovative products and services. Against this backdrop, numerous managers have been responding to complying with expectations and requirements posed by the notion of CSR (Ogrizek, 2002). This is manifested often through organisational publications, participation in discussion forums and public relations efforts (Gore, 1998). This tendency is part of an ever increasing effort on behalf of banks to succeed in an extremely competitive environment by serving purposes of positive social impact. Dating back to the early 2000, a survey conducted by PwC in 2002 revealed that nearly 70 per cent of CEOs maintained that CSR was vital to their companies' profitability (Simms, 2002).

The idea of the so called "business case" is widespread in the writings of Heal (2004) who opines that banks could significantly benefit from applying even the most rudimentary notions of CSR in their human resource practices and their community involvement rationale. Despite the potential of benefits emanating from CSR, there is a great variety in both depth and breadth of engagement. In the study of Gray et al. (1995a,b) referring to United Kingdom's context, it was found that reporting practices of banks were relevantly widespread. In the Irish case, Douglas et al. (2004) asserted that the country's banking sector was falling behind in comparison with leading European banks in terms of quality and quantity of disclosure. In Singapore, Tsang (1998) stated that the corporate social reporting of the banking sector was relatively low. Following this line of reasoning, another research by Halabi (2006) found that Australian banks were amongst the highest performing companies in disclosing environmental and social information. Last but not least, Nikolaou (2007) demonstrated that Greek banks disclose environmental information in term of accountability and an effort of securing a qualitative environmental performance framework. Apart from these, empirical validation also pertains to banks applying both a social perspective in their operations through immediate engagement such as philanthropy and social community strengthening as well as creating specific foundations for carrying out context specific social activities (Imam, 2000). The overarching areas of CSR engagement for banks are eloquently delineated by Quintas (2000) who divide them into principles and practices of good governance (1), the social and environmental dimension of internal and external stakeholder relationships (2), the social focus of financial activity through impact investment (3) and social works (4).

McWilliams et al. (2006) states that CSR is conducive to stabilising an organisation and securing its operational performance. Indicative is the case of both Lehman Brothers and Bear, Sterns & Co. Inc who were considered amongst the most respected, prestigious and enduring banks (Norton, 2011) and resulted in collapsing due to poor reporting and misleading users on their financial strengths (Jones, 2011a). This case is reminiscent of the fact that economic behaviour is dependent on the community's beliefs (Romer, 1984) forming the main motivational mechanism for market participants (Kim and Venkatachalam 2011, Hong and Kacperczyk 2008). It becomes therefore apparent that CSR engagement representing a well-established system of socially endorsed behaviour (Jones 2011b, Jahdi and Acikdilli 2009, Vanhamme and Grobben 2009) is imperative for the banking sector's survival. Graafland and van de Ven (2011) support that for banks CSR entails increased professionalism, stronger focus and compliance on codes of ethics, verification of employee capabilities as well as transparency, stakeholder response and collaboration with social institutions.

The Equator Principles (EPs, 2013) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision- making. This tool try to connect the environmental and social risk

with financial plans. In 2009, 68 financial foundations in 28 countries have adopted these principles. SRI could be described as an investment discipline considering environmental, social and governance perspectives in achieving simultaneously both financial returns and positive societal impact. It is indicative that by the year 2013, more than one out of every six dollars under professional management in the United States (approximately $6,57 trillion) were invested according to SRI strategies (US SIF Foundation, 2014).

The idea for this tool is not new. Banks in America used SRI at first time in 1920s but it came known to everyone in 1990s by its success in stable growth. SRI is an investment strategy which combines the financial return with social goods. It is also a way for banks to improve their extra-financial criteria according to the decision process concerning their portfolio. Through this practice, banks actually act as institutional investors. And this is especially helpful in trying not to sidestep the indispensable necessity of the tow-folded aim that banks through capital investments should serve.

There is growing evidence that banks as institutional investors are keen on adopting extra-financial goals in their investment decisions and the issues of whether these investors perform better or worse receives central stage. The goal of SRI is to combine financial corporate performance with social good. When it comes down to achieving this goal in practice, there are various investment strategies to implement. Emanating from the close inquiry of academic and practitioner agendas, different investment strategies can be delineated. The literature review has identified three distinctive ways, namely social screening (1), engagement (2) and community involvement (3). These practices can be viewed under the heading also known as ''SRI screening practices''.

Screening connotes the practice of including or excluding companies from banks' portfolio with respect to certain environmental, governance and social criteria and is known as negative and positive screening (Domini, 1994). On the one hand, negative screening is the simplest form of socially responsible investment and materializes through the avoidance of investing in companies that are either considered as unethical (Sparkes and Cowton, 2004) or belonging to certain industries that are negatively perceived of by the publics due to their subject of business (e.g. tobacco, weapon manufacturing). On the other hand, positive screening favours those companies with above-average CSR performance and according to Renneboog et al. (2008) is often coupled with a best-in-class approach where investments are conducted to those companies exceeding a certain threshold of CSR performance and in accordance to pre-determined standards (Schueth, 2003).

As a last socially responsible investment strategy we find community involvement or else as widely used with the term ''community investing'' (Glac, 2009). In its narrow conceptualisation it deals with supplying capital to the financially excluded. In its broader sense it equates with philanthropy, donations and sponsorships (Renneboog et al., 2008) and under this perspective is closer to philanthropic CSR that Porter and Kramer (2002) speak about. The differentiation between these two ends rests upon whether the donations of money and supportive services are made in light or not of an ''expected return'' even though this distinctive line is fading away due to the influence of associated value (Austin and Seitanidi, 2012) where indirect benefits such as reputation enhancement occur (Lii and Lee, 2012) that in turn could act as a market differentiation factor.

The case of CFPB is unique by both means of innovativeness and ''newness'' of approach even when compared with international best practices as well as the mix of responsible investment it depict with elements of engagement and community investment being prevalent. The main

research area of the current paper falls within the premises of community involvement and in more specific we embrace the extended notion where sponsorship activities are also included. By doing so, we aim at overcoming the inherent drawback reverberating the majority of CSR research where researchers adopt an either or stance towards the issue of value and the related shorter- or longer- term perspectives. We aim at studying the implementation of CSR related investments of the banking industry from a social investment standpoint. In more specific, we make inquiries into Piraeus Bank Group and its CSR engagement through its Cultural Foundation supporting and running certain thematic museums. In doing so, we investigate how this set of practices affects the bank's organizational posture and its relationships with the respective local communities.

The rest of the study is organized as follows. Section two delineates the global overview with respect to the banking industry's practices in CSR community involvement through sponsorships. In the next section, we substantiate our arguments concerning the preferred methodology. The penultimate section presents the empirical results. The final section is a summary of both the study's conclusions as well as academic and business practice implications while also outlines potential avenues for future research attempts.

GLOBAL OVERVIEW

Nowadays, banks throughout the globe support social and environmental friendly actions. The main ethical-social approaches, supported by a distinctive business model in each case, are summarised in three categories. First, social responsibility is mainly tackled through the issuing of a CSR report where providing information about the bank's socially related actions is the only objective. This is also depicted by the phrase ''what they say'' meaning that it is a sole exercise of managerial discretion on behalf of the bank in deciding what and how to report. This in turn renders itself vulnerable against criticism of ''greenwashing'' and ''public relations'' in the bank's pursuit of presenting itself favourable in the eyes of investors and/or customers. This resembles more the effort of creating trust or else strengthening the reputation of being responsible. This constitutes a reactive approach in terms of value creation, hence the ''old'' business model paradigm remains unaltered and any CSR activity an in more specific social issues are treated from a risk management approach where securing reputation is the main objective. Second, is the case of social responsibility as a potential opportunity for improving the banking sector's bottom line. In this case, attention is given to ''What they are'' or else the establishment and commitment to the principles of social responsibility that will serve as the springboard for taking up different initiatives towards fulfilling their objectives. This approach disengages from the pure reactive character of the previous one and instead entails a degree of proactivity where social issues present themselves as potential future opportunities. Third, we discern a differentiated from traditional bank models approach where the organisation is further engaged into solving social problems and is recognised under the rubrics of ''ethical banking''. The difference between the second and the third approach rests upon the driving motivation. Whereas the second type of business model is justified through an instrumental approach, the third one establishes its case through a normatively attuned justification.

In the first and second streams, all actions from banks are taken in pursuit of economic efficiency. Ethical aspects and normative accounts constitute subjective additions, sociological restrictions, external obligations or valuable considerations attached and subordinated to economic rationality (Melé and Guillen, 2006). In the third view, normative accounts prevail over economic effectiveness and efficiency. However, this is not a matter of dichotomy, like a yes or no answer, but resembles more an issue of relevance and prioritization. Economic action

in this manner is embedded in the prevailing social reality and unfolds within a normative context (Koos, 2012). As such, the banking sector's response to different social issues runs across a continuum from more reactive towards more proactive postures. This idea of different stages concerning the business model a bank adopts is inherent of the CSR concept itself. These modes of responsiveness aim at achieving either a shorter- or a longer- term advantage. In the former case, the prevailing perception is that social responsibility is an additional cost (Orlitzky, 2008) and manifests mainly as a reputation safeguard. In the latter case, reputation enhancement is again prevalent and served through strategies of cost leadership and differentiation (Kurucz et al., 2008).

This goes hand in glove with the importance that society gives to aspects apart from the pure economic reasoning. Emphasis is now placed on museum investments as a means of responding to social expectations and banks consider this engagement as promising for securing loyalty and increasing their customer base (O'Connor, 1998) since museums are the most attractive places for those visiting a country with more than half of the tourists visiting them (Richards, 1999). The main objective in this case is to leverage the far-reaching potential of museums to the benefit of the local society and economy. These types of museums are known as GLAMUR museums (Global Art Museums as Economic Re-Activators) and their role is to instigate a renewal of economic activity.

This new trend has been gaining momentum and many banks are now not only sponsoring but also managing museums. It is a form of financing amongst other such as government funding and endowments. From this perspective, museums have started to resemble more a form of social enterprise where banks are actively engaged as a means of securing seamless operation with the provision of the necessary financial and managerial capitals. In this manner, banks consider the main income sources of museums through tickets, souvenir shops and dedicated social intervention meetings as potential leverage points for their competitive advantage. Under this perspective, it seems rather safe to assume that this ever increasing trend of museums being deployed by banks as social enterprises that has been ongoing during the last twenty five years will continue at the same pace.

Sponsorship is the best way for museums to retain and further develop their existence and their offerings. To this end, banks appropriate large sums of money with the aim to create and expand museums' art collections while at the same time the treat these allocations as important social investments. This practice has been flourishing in the US from the early 1960s where David Rockfeller through Chase Manhattan Bank inserted the idea of ''corporate art collection''. This constitutes part of the wider attempts exerted by banks to exhibit their collections of art or fund and raise their own galleries as a means of attracting potentially new and wealthy customers while at the same time this effort was endowed with an egalitarian balm of fairness and proximity to the community and providing social value by raising the educational and satisfaction level of inhabitants. Following this line of reasoning, social status is granted to banks by serving as a potential differentiating factor whereas cultural and pedagogical aims are also fulfilled at the same time.

In this form of banks embracing a type of social enterprising they provide capital to the museum's ongoing operations. In essence they serve as capital provider let alone the incidents were they actively engage themselves in managing the museum itself. This has been a distinctive trend in Anglo-Saxon countries. An indicative example is the renovation of the London Museum back in 2007 that lasted for three years where it secured a full sponsorship of £18 million after its opening in 2010 from the oldest independent bank in the United Kingdom, namely C. Hoare & Co. Bank. A variation of this practice is also reflected through targeted

efforts to create museums or networks of museums with respect to the history of specific places and as well as scientific thematic exhibitions and cases of preserved environmental areas. The first recorded case of this variant belongs to the Bank of England back in 1964 when it established its own museum in pursuit of forming and educational partner by means of demonstrating the wider sociocultural and historical trends of the country. This movement was more than just money but it also connected back to the independent bank's operations through favourable terms of policy-bank relations.

Another illustrative example come from the Spanish context. The Spanish Caixa Bank founded a new generation of science museums as a realisation of an innovative idea dating back to 1990. One of the overall objective of the bank is to return money to the society from the added value derived from its financial activities. The main activity areas where the bank delves into as an explicit form of social contribution are research, science, environment and culture. Its museum is located in Barcelona in a building from 1909 fully renovated. This is the first interactive museum hosting animals and offering the opportunity to visitors of learning how to regard them. Special care has been given to the settings of the museum in order to make every visit as close as possible to resembling a walk in the forest. The social responsibility of Caixa Bank is also realised through the management the biggest charity institution in Spain and one of the biggest worldwide. More than €100 million are paid every year to cultural and environmental reasons. Furthermore, the bank collaborates with other museums such as the British museum and the museum of Louvre in order to host different exhibitions in its own premises. To continue with, in Sweden a network of banks offers to its customers credit cards with the ability to serve as entrance cards allowing them to visit museums. This unveils positive impacts for both the banks and the alliance museums. On the one hand banks strengthened their social responsibility image and the museums achieved an additional and secured input of profits.

In Germany, culture is considered an important aspect of social responsibility and consequently a fruitful field for banks to differentiate. In this case, instead of selling their own artworks, banks lease them under longer term agreements to museums. For example, Commerzbank assisted in this sense museums to organise popular exhibitions by hosting the bank's private art assets and the bank itself strengthened is image. Deutsche Guggenheim is a depictive case of a unique partnership between the bank and the Salomon R. Guggenheim institution with other museums in New York, Venice, Bilbao and Berlin. Both partnering organizations meaningfully support the management of Deutsche Guggenheim. Their main goal is not to increase the number of visitors but to promote modern art. However, it is acknowledge that the former might have rebound effects on the latter. Furthermore, Deutsche Bank owns one of the biggest art collections worldwide. Herbert Zapp was the first to adopt the idea of art works. At present, the bank has a collection of approximately 56000 art items and deploys the exhibition as a means of public relations as well as attracting new customers. Specifically, the bank has been implementing the program known as ''Art Works'' where its collection is made publicly available throughout its bank network to employees, customers and the public as well.

It becomes evident through the previous discussion, that there are cases worldwide indicating the increased uptake of this form of social enterprising from banks as a means of exhibiting CSR related activities. The cases elaborated have various forms and degrees of a reactive and/or proactive posture towards CSR. From simply using art collections and sponsorships as a means of attracting more customers while at the same time increasing cultural awareness and serving education reasons as an output of social value to more advance responses where

the business model is significantly altered and introduces forms of partnerships through not only financial donations but through active support and engagement of the bank's established cultural foundations. However, there is still limited if not scant knowledge concerning motivations, value propositions and the perceived facilitators and obstacles that banks encounter in this specific form of social endeavour.

Aiming at increasing our understanding and unveiling the potential and particularities of this form of social responsibility that banks have started embarking on, we focus on the Greek context and in particular we use as our case reference the CFPB of the Piraeus Bank Group. This foundation is a non-profit institution sponsored and managed by the bank. The scope of CFPB's cultural activity covers the largest part of the bank's social responsibility practices. In this view, the foundation manages an organized network of nine thematic museums and the overarching goals is twofold: to save and promote the industrial technology of Greece. As such, it presents a unique case worldwide due to the nature of exhibitions and calls for elaborating on the particularities the foundation's role and practices.

RESEARCH METHOD

Due to the limited knowledge on this special case of social engagement that banks proceed with, we opted for a case study approach. This is particularly appropriate where limited research exists (Yin, 2003). This treatment also assists in overcoming the social desirability bias inherent in the study of the CSR topic (Eisenhardt and Graebner, 2007) and facilitate a deeper understanding towards preparing for research propositions and patterns of interactions (Eisenhardt, 1989). The interviewees were identified through purposeful sampling (Patton, 2002). They were selected on the justification of their degree of involvement with the particular social investment type of CSR action, their level of expertise as well as their hierarchical position and their length of employment in order to gain a rich account of the practice's implementation and evolution. To further elaborate on our choice, we abided by the measures outlined by Gibbert et al. (2008) to secure validity and reliability throughout the research process as well as alleviate any potential obstacles towards making connections with the applied theoretical lens and available literature. We catered for reliability through a case study protocol and a semi-structured interview guideline. External validity was considered through the collection of secondary data such as the foundation's and the Piraeus Bank Group's relevant reports on CSR issues. Construct validity was achieved through data triangulation by incorporating into the analysis internal guidelines and reports on social responsibility issues. Last but not least, internal validity was realised first by extracting our research focus from a thorough literature review and well supported concepts and second through interviewing the most knowledgeable informants and from different positions about the issue in question.

Our research aimed at investigating the relationship between the bank's operations and the cultural industry as witnessed through the CFPB as well as the effects posed on the organizational structure of the bank. The survey took play in 2016 and the following three executives form Piraeus Bank Group were interviewed:
- An executive from Piraeus Bank Group's department of CSR
- An executive from the CFPB
- The director of one thematic museum, namely the Marble Crafts Museum located in Tinos island

The interviews were recorder and subsequently transcribed and coded by the researchers individually where subsequent consensus was achieved through comparing the classifications of data categorization and key categories derived.

FINDINGS

The nine thematic museum under the jurisdiction, supervision and function of CFPB are: the Silk Museum in Soufli(1), the Museum of Marble Crafts in Tinos(2), the Open Air Water Power Museum in Dimitsana(3), the Museum of Olive and Greek Olive Oil in Sparta(4), the Museum of Industrial Olive-Olive Oil Production in Lesvos(5), the Mastic Museum in Chios(6), the Museum of Rooftile and Brickworks in Volos(7), the Environment Museum of Stymphalia(8) and the Silversmithing Museum in Ioannina(9).

This expanding museums' network represents a unique, large scale cultural intervention as part of the wider social responsibility of Piraeus Bank Group. CFPB aims at creating and further developing an altered notion with respect to strengthening regional competencies and adding social value. The aforementioned museums are part of a wider aspiration of becoming the meeting places for local communities. In 2012, CFPB was awarded in the category ''Dedidacated Services'' from Europa Nostra for its activity and support in realising the preservation and further fusion into contemporary practices of the traditional and industrial heritage. In a proactive manner of decision making and operations CFPB has already been developing several actions for solidifying even more the potential social benefits through publications, research projects, scientific events as well as the establishment of a historical archive serving as a main reference point for those interested in the specificities of each regional museum and the cultural heritage targeted at each individual case. The operational model of this museums network includes administrative, accounting and marketing services in the foundation's premises. This model is facilitated and further supported through the extensive cooperation achieved and offered by the local communities as well as the various municipal and regional governmental authorities.

The major outcome reflecting the philosophy of CFPB and its future orientation could be described as ''the preservation and showcasing of Greece's cultural heritage, with an emphasis on its artisanal and industrial technology as well as the connection of culture with the environment''. The benefits of the local communities are important. For example, they accommodate the hundreds of thousands of visitors for the museums in question. This in turn acts in a revitalizing manner for the local economy whereas at the same time it further strengthens reputation and tourist brand name. The mission of CFPB is effectuated in a seamless interaction with the Hellenic Ministry of Culture, the regional self-governmental authorities, the local societies and a broader network of industry and academic experts on social/cultural and environmental issues.

All the interviewees highlighted that CFPB is ''a voluntary non-profit foundation and its statues, its operational costs, including those of its museums, are covered by Piraeus Bank Group''. This denotes an important contribution on behalf of CFPB since every profit and income achieved through sales, tickets etc. are totally reinvested in the museums in order to support their functioning needs and expand their operations. Additionally, CFPB ''pursues the co-financing of certain projects through national and European programs''. In continuation, CFPB also fosters collaboration networks with higher education institutions, research excellence centers, cultural institutions as well as with knowledgeable individuals and experts both within Greece and from abroad. All the interviewees presented their action plan and the framework supporting this endeavour that includes the recording and collection of Greek cultural heritage and identity, the preservation of the traditional, artisanal and industrial technology of Greece and the meaningful coupling between the cultural element and the relative advantage and idiosyncrasy of each region.

The research also unveiled that the establishment and function of CFPB depicts a unique model of CSR with respect to culture worldwide. As has been also implied in the previous pages, banks often choose a less direct relationship with culture and their social commitment as usually explicated through sponsorships and grants. Even though the latter constitute a less time-binding relationships undoubtedly entailing less risk, CFPB is engaged proactively towards creating and appropriating value. Even though this approach might impose greater investment risk, it translates into increased social and financial value for the communities involved and also receives a business case notion for the bank itself even though profit is not the motivating driver for this venture. This is also highlighted by another finding according to which the museums support local societies through direct and indirect impacts. For example, they recruit and employ people from these communities as well as from a supply chain perspective where these museum supply their premises with local and regional resources and products. This in turn pays off in environmental terms as well since the transportation aspect of the supply function is reduced, hence low carbon management is also realised. Local production is further facilitated through exhibition events and Promotional marketing in cooperation with commercial chambers and associations of small and medium sixes producers. To elaborate even further on the derived benefits, the experience from CFPB proves that many of the museums' visitors become customers of Piraeus Bank Group, hence they actively contribute to its potential growth. This might be seen as a natural consequence since the brand name and reputation of the bank increase and the band is advertised in certain contexts within the individual museums. This bodes well with the argument that consumers need some credential of organisations being truly responsible instead of only preaching and pretending about adopting CSR practices. In our case, the bank strengthen its reputation and further differentiates from the competitors both in terms of products offered and in light of the processes applied for the operational support of each museum.

These benefits become more important and diversified if we consider the scope of positive impacts emanating from CFPB's actions and the museums themselves. Relevant activity is further extended and integrated to other sectors apart from the banking industry where knowledge exchange and mutual benefits serve as the collaboration roadmap. The opening and operation of a specialized library with open access, the implementation of various educational programmes with a focus on especially school-going ages and activities of participation in public dialogue to co-formulate social impact areas and cultural heritage are indicative of the multifaceted and beneficial nature of the CFPB's role.

Beyond doubt, the banking sector is characterised by a fully competitive environment, especially if one considers the current adverse economic environment prevalent in Greek reality as a result of the fierce crisis. This leads to the argument that many banks give priority to minimising on CSR costs and engage in those absolutely necessary activities that will foster their image and indirectly support their profitability. The case of Piraeus Bank Group has unveiled an innovative approach, one of its king even when considering international best practices through effectively managing normative justifications with instrumental calls.

CONCLUSIONS

The main objective of the current paper was to investigate the role of the banking sector in the field of cultural investments as a manifestation of CSR practices targeted towards creating social value. The preceding literature review revealed that the case of CFPB constitutes a unique case worldwide. Due to this gap in the literature and because of the uniqueness hence the extreme case this offered for empirical investigation, we dwelled on the practices adopted by CFPB. This expanded our research focus on both organisational levels within Piraeus Bank Group and the different interaction emanating from CFPB. As such, we aimed at understanding

the processes underlying the respective initiative. In doing so, we explicate how a socially oriented CSR program from the bank fosters it business model transformation and how it is further supported through the CFPB and the different stakeholders. This work also presents that the so called business case of CSR is a combinatory outcome of both normative and instrumental aspirations, hence it provides a good example on managers on how to start embracing a delicate balance between exploration and exploitation activities and reminds us about the fact that often CSR outcomes might not be easily measured but they do entail benefits attributed to different target groups.

Although our research provides insight into this unique phenomenon of CFPB and its significance for Piraeus Bank Group and the related CSR posture, it comes not without limitations. While our approach was deemed appropriate for uncovering meaning and interrelations within this case, thus achieving increased internal and construct validity, it retains lower levels of external validity. However, due to the idiosyncratic nature of our case it seems difficult if not unavoidable to succeed in replicating and refining our propositions through a confirmatory large scale survey. Following this line of reasoning, another potential future avenue could rely on investigating those necessary capabilities needed on behalf of the foundation to successfully respond to the various activities it supports. Furthermore, insight could also be gained in conducting a longitudinal case study approach for CFPB at multiple consecutive points in time in order to further comprehend how the various mechanisms used between CFPB and the stakeholder groups support through time the development of those necessary capabilities. Third, it would be interesting to explore how the sustainability of this type of social purpose organization (i.e. CFPB) effectuates within its wider supply chain context. This is particularly important and answers the calls from Pagell and Shevchenko (2014) about studying supply chain settings where innovation is present and where implementing new organising practices answering the questions of how to become more sustainable are prominent. Last but not least, and in accordance with latest trends in business and supply chain research (e.g. Busse et al. 2016), attention could also be shifted towards the manner in which the foundation increases its supply chain visibility in tandem with the various community, state and other groups of stakeholders.

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Implementation of Activity Based Costing System in Making Effort to Determine The Tariff of Operation Action (Case Study In Surabaya Royal Hospital)

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ABSTRACT

The purpose of this study is to determine whether the application of activity-based costing system can show a more accurate resource allocation at Royal Hospital Surabaya . As well as a comparison tool with operating rates that has been established so far, especially in its application to a hospital that its orientation two goals that is community service and profit balance. This research was conducted at Royal Hospital Surabaya. The method used is descriptive method that is calculate the tariff of hospital operation action at this time, set cost method based on activity based costing, then compare tariff of operation action based on activity based costing with its realization. The results showed that from the calculation of the tariff of the operational action by using activity-based costing, if it is compared with the tariff used by the hospital, activity-based costing gives greater results for small operation actions and gives smaller results for medium and large operations. This is due to the overhead cost of each product. In activity-based costing, the overhead cost of each product is charged to many cost of drivers. So in activity-based costing, has been able to allocate the cost of activity to each operational action based on the consumption of each activity

Key word: Activity-Based Costing, cost driver

INTRODUCTION

The main task of the hospital is to provide medical services, care, and health services. In providing health services, hospital gets income from the services and facilities given, one of them is the operation action services, where the income from the services is obtained from the tariffs that should be paid by the service user or the patient. The tariff determination of this operation is a very important decision, because it can affect the profitability of the hospital. Based on the above conditions, the hospital is required to be able to utilize technology and experts in the field of health, communications, information, and the field of transportation that can support health services so as to make the operational costs that is spent by hospital becomes big that will affect high tariff for operation action.

To control costs, the hospital needs an appropriate accounting system, especially the calculation method for cost determination to produce accurate cost information related to the cost of service activity. The calculation of the basic cost is initially applied in a manufacturing company, but in its development the cost of goods has been adapted by the company of service, a trading company, and a nonprofit sector. In Article 3 of Decree of the Minister of Health Number 1165 / Menkes / SK / 2007 concerning arrangement of tariff pattern of Hospital of

Public Service Agency(PSA) needs to be adjusted with the development and need of health service. About setting the Public Servive Agency tariff pattern of the Hospital includes activities that are charged with tariff, tariff component, tariff calculation pattern, and revenue management of Public Service Agency of the hospital. This fact shows that the government has realized the importance of tariff calculation included in the health care sector. Two contradictory matters require hospital management to be able to set the right tariff so that the two goals can be achieved simultaneously.

As science developed in the early 1900s, a cost-based pricing system was established based on activities designed to overcome cost distortions. This accounting system is called Activity Based Costing (ABC). In the ABC method, the incidence of costs is caused by the activity produced by the product. This approach uses cost drivers that are based on activitis which generate the cost and would be better if applied to companies that produce product diversity. The purpose of this study is to raise the topic of activity-based costing system (ABC) which relates to one way to calculate or classify the costs that can be used as guidance tariff of hospital costs especially in the field of operation at the Royal Hospital one of the private hospital located in Surabaya.

LITERATURE REVIEW

Definition of Cost

Cost accounting is the process of recording, classifying, summarizing, and presenting the costs of making and selling products or delivering services, in particular ways, and interpreting the results. (Surjadi, 2013: 1)

According Syaifullah (2014: 10) In cost accounting known as cost and expense. Cost or commonly referred to as a fee is a prerequisite exchange rate or sacrifice made to obtain a benefit. Where the period is more than one year because it is capital expenditure (capital expenditure). The amount of rupiah spent in large amounts.

While the expense or so-called expense, represents a decrease in economic benefits in an accounting period in the form of an outflow of assets, or the occurrence of liabilities resulting in a decrease in equity, which does not involve the division of investors. The period is less than one year because it is a revenue expenditure (revenue expenditure). And the money issued relatively small.

According to Bustami and Nurlela (2012: 3) Cost, (cost) has not expired, and is classified as assets included in the balance sheet. Example:
   1) Supplies of raw materials
   2) Inventory of product in process
   3) Product inventory complete
   4) Supplies or unused assets

While Expenses (Expense) is a cost that has given benefits and now it has run out. Unearned costs that can give benefits in the future are classified as assets. This fee is included in the Profit and Loss, as a deduction from income, Example:
   1) Depreciation expense
   2) Marketing expense
   3) Expenses classified as operating expenses.

Traditional Cost Accounting and its limitations

According Mulyadi (2014: 196) traditional cost accounting system calculate the cost of the production as a component products cost. In addition, traditional cost accounting systems only provide detailed information about production costs, costs incurred in the production. Production costs are divided into two categories: (1) direct production costs and (2) indirect costs of production. Direct production costs are production costs that can be charged directly to a particular product. Indirect production costs can not be charged directly to a particular product.

Therefore, in the traditional cost accounting system, product cost consists of 3 elements: (1) raw material cost (RMC), (2) direct labor cost (DLC), (3) factory overhead cost (FOC). RMC and DLC is a direct cost so as not to cause problems loading on the product. Loading RMC and DLC can be done accurately by using direct tracking or driver tracking. However, loading a FOC creates a problem. This is because FOC has no input-output relationship that can be physically observed. Therefore, FOC loading must be based on searching the driver and allocation.

In a traditional cost accounting system only used drivers' activity in unit-level to charge the FOC on the product. The unit-level activity of drivers are the factors that cause the change of cost in accordance with the changes in the product unit in production. The use of unit-level driver costs to charge the FOC on products assumes that the overhead consumed by the product has a very high correlation with the number of units in production. Examples of unit-level drivers are: (1) units in production, (2) percentage of RMC, (3) percentage of DLC, (4) direct working hours, and (5) hour machine.

Traditional cost accounting systems based on single tariff of FOC and department of FOC fit only in traditional manufacturing environments and domestic level competition. However, traditional cost systems create cost distortions when used in advanced manufacturing environment and global level competition. The environment of advanced manufacturing is an environment that is characterized by sharp and typically global competition, continuous improvement, total customer satisfaction, and advanced technology. Companies operating in an advanced manufacturing environment should use new strategies to achieve excellence. The cost accounting system used to charge a fee must be changed with a system compatible with the environment by using ABC. If the cost system is not altered, there will be too high distortion (cost overstated or cost overrun) for large-volume products and low cost (cost understated or cost under run) for a product with a small volume

Definition of Activity Based Costing

According to (Armanto 2012: 237) ABC is "a method of measuring the cost of products or services based on the cost accumulation of activities or activities arising in relation to the production or service. Cost calculations based on activity are product cost calculations based on actual activity of input sacrifice to obtain output. (Purwanti and Darsono Prawironegoro, 2013: 43).

Activity Based Costing system is an activity-based costing system, in general ABC uses a two-stage approach that is almost the same but more common than the system of tarditional cost. Traditional cost systems use departments and actual cost centers to define a set of costs to accumulate and distribute costs. The ABC system does not use cost centers, but uses its activities to accumulate costs. The development of ABC begins by asking what activities are being carried out by the department's resources. It then allocates the resource load to the activity based on some of the many resources used by each of those activities. The ABC system not only increases the thoroughness of costing, but also provides information on the cost of

various activities to enable management to focus on activities that provide opportunities for cost savings by simplifying activities, carrying out activities with more efficiently, and eliminates non value-added activities.

According to Stephanie (2008: 5) steps in development of an ABC system there are four steps to implementing ABC: 1) Identify activities, 2) Assign resource cost to activities, 3) identify outputs, 4) Assign activity costs to outputs. In the first stage, costing based on activity involves the following four steps: (1) classification of various activities, (2) associating various costs with various activities, (3) determination of homogeneous cost pools, and (4) determination of pool rate.

Difference between ABC system with Traditional system
As mentioned before, a conclusion can be drawn about the difference between ABC systems and traditional cost accounting. In general, the difference between ABC systems and traditional cost accounting is the number of measures of activity level. ABC uses more than one measure of activity level whereas traditional cost accounting uses only one measure of activity level ie the unit level measure as a basis for allocating overhead to output.

According to Riki (2011: 6) conventional cost system is less able to meet management needs in an accurate cost calculation, especially if it involves considerable indirect production costs and product diversity. Traditional accounting systems are used to determine product costs for extension financial statements. ABCsystem is used to determine the product and cost for a special report to the manager

Hospital Definition and Hospital Accounting
Understanding the hospital according to Regulation of the Minister of Health of the Republic of Indonesia No. 340 / MENKES / PER / III / 2010 are: "Hospitals are health services institutions that provide full range of personal health services providing inpatient, outpatient and emergency care services". From the above understanding, the hospital conducts several types of services including medical services, medical support services, care services, rehabilitation services, prevention and improvement of health, as a place of education and or medical training and medical, as a place of research and development of science and technology in health as well as to avoid the risks and health disturbances as intended, so that it is necessary condut healthy hospital environment in accordance with health requirements. Based on its ownership, Law No. 44 of 2009 on Hospital in Indonesia into two types, namely:

1. Public hospitals that are government-run hospitals (including local government) and other non-profit legal entities include:
   a. The hospital belongs to the Ministry of Health
   b. Hospital owned by Provincial Government
   c. Hospitals belonging to Regency / City Government
   d. The hospital belongs to the Indonesian National Army (TNI)
   e. The hospital belongs to the Police of the Republic of Indonesia (Polri)
   f. Hospitals belonging to Departments outside the health department (including state-owned companies such as Pertamina).

2. Private hospitals, ie hospitals run by legal entities with the purpose of profit in the form of limited companies or company, include:
   a. The hospital belongs to the foundation

    b. Hospitals belong to the company
    c. Hospital owned by Investment (domestic and abroad)
    d. Hospitals belong to other legal entities.

In terms of service, private hospitals should also be recognized as having the role of creating a healthy Indonesia in 2010. If the quality and the system of private hospital services are reviewed in terms of fulfilling the demands and desires of consumers or patients, many private hospitals prioritise the services. Besides the quality of service , medical support equipment is also more sophisticated and modern compared to government hospital has. Hartono (2010: 5). To achieve all of them need a very much funds. Therefore, the better quality and service in private hospitals, the more expensive the patient should pay. But with that alone sometimes the hospital has not been able to cover its operational needs.

So the management of private hospitals should seek other alternative to increase revenue and allocate funds as needed. Fund accounting applications can also be seen in accounting practices in the hospital. However, it should be realized that not all hospitals are non-profit organizations. Some hospitals are operated as earnings-seeking companies, some even selling their shares in the stock market. In the case of profit-oriented hospitals, the accounting standards followed are the financial accounting standards used for the commercial sector

RESEARCH METHODS

The type of research used by the authors is qualitative research. which are descriptive and tend to use analysis and further highlight the process and meaning. Population is the whole subject of research, Arikunto (2010: 173). In this study population is the tariff of operational actions that are distinguished according to the risks of small operations, moderate operations and major operations in classes VIPs, I, II, and III.

The sample used by the researcher is a purposive sample that is the technique of determining the sample with certain considerations (Sugiyono, 2011: 68). That is the operational action tariff that is distinguished according to the risks, that is small, medium and major operations in class III

Activity Based Costing System is the information system that is oriented on providing complete information about activities to enable companies to manage activities to determine the cost of products accurately.

Traditional accounting system is an information system that culculates the cost of the production stage as a component the product cost and focuses on the cost of production. The operating tariff is a nominal amount or price in rupiah that has been made in accordance with the standard of tariff determination in such a way, based on the Law and the Minister of Health's decree. Then it is the obligation to be paid by the patient who has performed the surgery

RESEARCH RESULT

Calculation of the cost of providing operating room services using traditional cost accounting

To determine the cost of operating room service provision, Royal Hospital Surabaya uses the traditional cost, that is by using direct labor hours for each operation handling, as the cost driver for the indirect costs incurred in the operating room unit. The calculation of the cost is done by adding up all indirect costs to the operating room unit, then dividing the total indirect costs by direct labor hours for each type of operating action. The direct labor hours used are

less than 1 hour, over 2 hours and over 3 hours, for each type of small, medium, and major operation. The number of direct hours spent for 2014 is 3,427 hours. The amount is obtained from the calculations presented in the following table

Table 4.1 Rating of direct labor hours In operating room units for 2014

No	catagory	Number istimation	Labor hour	Labor hour numerr
	Operation	Pasient (A)	Diretc (B)	Direct (AxB)
1	Minor operation	608	1	608
2	Medium operation	832	2	1.664
3	Major operation	385	3	1.155
	Total	1.825		3.427

Source : Royal Hospital Data

The indirect cost allocated to the operating room units for 2014 is Rp. 1,061,300,105. Details of these costs can be seen in the following table

Table 4.2 Indirect cost budget in operating room units for 2014

No	Kinds of cost	total
1	Salary & allowance	460,460,494
2	Overtime	6.300.000
3	Office uniform	2.100.000
4	Employees' treatment	2.520.000
5	Consumption/snack	10.950.000
6	pension cost	31.000.000
7	Lebaran day allowance	30.000.000
8	Electricity	18.069.810
9	Water	4.542.120
10	Telephone, fax & internet	7.347.674
11	Stationery & printing	2.284.591
12	Household material	30.456.158
13	Reduction of assets	98.463.067
14	Maintenance for assets	121.675.900
15	Maintenance for building	125.360.920
16	Incentive	4.200.000
17	Appraisal	1.000.000
18	Training	25.000.000
19	Office travel	36.615.880
20	Recreation	7.743.696
21	To entertain guest/meeting	1.830.500
22	Oxygen	33.379.295
	Total	**1.061,300,105**

Source : Royal Hospital Surabaya.

From the above data, the cost of providing operating room services, can be calculated as follows:

Indirect tariff = Rp   1.061,300.105
                                              3.427

                          = Rp.   309.697.8

Table 4.3 Indirect cost calculations on operating room units for 2014

No	Kinds of operation	Indirect Cost	TKL	Total
1	Minor Operation	309.687.8	1	309.687.8
2	Medium Operetion	309.687.8	2	619.375.6
3	Major Operation	309.687.8	3	929.063.4

Calculation of the cost of providing operating room services using ABC

The ABC system is a cost calculation system that charges the cost to products or services based on resource consumption caused by activity. Implementation of the ABC system will result to the burden of cost to products or services more accurate than conventional accounting, since the ABC system uses more cost drivers The cost of providing operating room service by using the ABC system is done by stages as the following:

1.   Activity identification

After identifying activities that incur indirect costs on the operating room unit, the next step is to classify the activities into a level of group activity. The level of activity in operating room unit, among others:

a) Unit-level activity

Unit-level activity is an activity performed every time unit of operation action service is performed. The amount or cost caused by this activity is influenced by the number and duration of one unit of operation performed. Indirect costs groups caused by unit level activities, among others: overtime costs, water costs, incentive costs and oxygen costs.

b) Facility level activity

Facility level activity is an activity undertaken to sustain the process of providing operational action services. Big or small of the costs incurred by this activity is not influenced by the number or duration of one unit of operation services carried out by indirect cost groups that caused by the facility level activity, among others: salary and allowances, clothing costs, employee treatment,Lebaran day fees, consumption / snack fees, severance costs, telephone expenses, stationery and printing costs, and so on. To clarify the above description, the following table presents an indirect cost budget summary of the operating room units for 2014

Table 4.4 Summary of indirect cost budget on operating room units for 2014

The cost based on activity level	Total
Activity unit level	
Overtime	6.300.000
Electricity	18.069.810
Water	4.542.120
Incentive	4.200.000
Oxygen	33.379.295
Activiti level facility	66.491.225
Salary allowance	460.460.494
Clothing	2.100.000
Employees' treatment	2.520.000
Consumption/snack	10.950.000
Pension cost	31.000.000
Lebaran allowance	30.000.000
Water	4.542.120
Telephone	7.347.674
Stationery and printing	2.284.591
Household material	30.456.158
Reduction of asseets	98.463.067
Maintenance for assets	121.675.900
Maintenance for building	125.360.920
Recreation	7.743.696
Appraisal	1.000.000
Training	25.000.000
Office traveling	36.615.880
Indirect cost total	

2. Determination of the homogeneous cost pool, and the cost driver of each group of homogeneous costs

The homogeneous cost group is a set of indirect costs related to the activities performed, and the various costs can be explained by a single cost driver. Based on the activities identified in the previous stage, at this stage cost groupings can be grouped into homogeneous cost groups, as well as the determination of cost drivers for each group of homogeneous costs. Determination of the homogeneous cost group, along with the cost drivers of each homogeneous cost group, can be seen in the following table:

Table 4.5 Determination of homogeneous cost groups
Homogeneous cost groups and the cost driver

Homogeneous cost groups	Cost driver	Total
Cost pool 1		
overtime		6.300.000
Electricity		18.069.810
Water		4.542.120
Oxygen	The number of Labor hour	33.379.295
Total of cost pool 1		62.291.225
Cost pool 2		
Salary allowance		460.460.494
Clothing		2.100.000
Employees' treatment		2.520.000
Consumption/snack		10.950.000
Pesion cost		31.000.000
Lebaran allowance		30.000.000
Training	The number Of employees	25.000.000
Appraisal		1.000.000
Recreation		7.743.696
Office traveling		36.615.880
Total of cost pool 2		607.390.079
Cost pool 3		
Telephone		7.347.674
Stationery and printing		2.284.591
Household material		30.459.158
Reduction of assets		98.463.067
Maintenance of assets		121.675.900
Maintenance of building	The number of patients	125.360.920
Incentive		4.200.000
Entertaining guest/meeting		1.830.500
Total of cost pool 3		391.618.810
Total of indirect cost		1.061.309.105

Source : Data obtained by writer

3. Determination of cost group tariff (cost pool tariff)

The cost group rate is the indirect cost rate per unit cost driver, which is calculated for a group of activities. The cost group tariff is calculated by the formula: the total indirect cost of a particular activity group, divided by the cost driver of the activity group. The following table presents the calculation of cost group tariff.

Table 4.6 calculation of cost group tariff

Cost pool	Total cost every cost pool	Total cost driver	Cost pool rate
	(A)	(B)	(A.B)
1	Rp 62.291.225	3.427	18.176.60
2	Rp. 607.390.070	3.650	166.408.24
3	Rp. 391.618.810	1.825	214.585.65

Source : Data obtained by writer

Value of Total cost driver in the above table, obtained by the calculation presented in the following table

Table 4.7 Calculation Total cost driver

Catagory of Operation	Total Patients estimation	Direct Labor Hour	Total hours Of direct labor	employees	Total of employees
	(A)	(B)	(AXB)	(C)	(AXC)
Minor operation	608	1	608	2	1.216
Medium operation	832	2	1.664	2	1.664
Major operation	385	3	1.155	2	770
Total	1.825		3.427		3.650

Source : Data obtained by writer

Table 4.7 in column (B) indicates that in order to perform one minor operation, medium operation, and major operation, 1 hour, 2 hour and 3 hours direct labor is required. In column (C), it indicates that to perform one minor, medium and major operation action required each of the 2 employees who acted as a nurse for minor operating room or an operations assistant.

4. Cost tracking of each group

At this stage, the cost of each cost group is traced to each service provider for operation action, using the formula: cost of group tariff, multiplied by the total cost driver consumed. The calculation of the cost of providing operating room services, for the category of minorl, medium, and major operations can be seen in each table below

Table 4.8 Calculation of cost of services for operating room

No	Operation service	Cost pool rate	Total cost driver	Total Indirect cost
		(A)	(B)	(AXB)
1		18.176.60	1	18.176.60
2	Minor operation	166.408.24	2	332.816.48
3		214.585.65	1	214.585.65
The cost of providing operation room service			565.578.73	
1		18.176.60	2	36.353.2
2	Medium operation	166.408.24	2	332.816.48
3		214.585.85	1	214.585.65
The cost of providing operation room service			583.755.33	
1		18.176.60	3	54.529.80
2	Major operation	166.408.24	2	332.816.48
3		214.585.65	1	214.585.85
The cost of providing operation room service				601.931.93

Source : Data made by writer

DISCUSSION

Based on the results of the previous analysis, then compared the results of the calculation of the cost of operating services operations according to traditional cost accounting and calculation results according to ABC system. Comparison between the calculation results

according to traditional cost accounting, with the calculation results according to ABC system, can be seen in the following table:

Table 5.1 Comparison of cost of operation service for operational action according to traditional cost of accounting, and ABC system.

Catagory of operation	Traditional	ABC System	difference
Operation cost	Accounting cost (Rp)	(Rp)	(Rp)
Direct cost	555.493	555.493	0
The cost of material used			
The cost of doctor's service	2..112.500	2.112.500	0
Anesthesia & nurse fo M.O			
Indirect cost	309.687.8	565.576.73	(255.890.93)
Every operation action cost	2.977.680.8	3.233.571.73	(255.890.93)
Total patients	608	608	0
The cost per action			
Operation in 2014	**1.810.429.925.4**	**1.966.001.611.84**	**(155.581.685.44)**
Medium operation			
Direct cost			
The cost of material used	826.936	826.936	0
The cost of doctor's service	3.970.500	3.970.500	0
Anesthesia & nurse fo M.O			
Indirect cost	619.375.6	583.755.33	35.620.27
Every operation action cost	5.416.811.6	5.381.191.33	35.620.27
Total patients	1.664	1.864	0
The cost per action			
Operation in 2014	**9.013.574.502.4**	**8.954.302.373.12**	**59.272.129.28**
Major operation			
Direct cost			
The cost of material used	1.083.423	1.083.423	0
The cost of doctor's service			
Anesthesia & nurse fo M.O	5.896.500	5.896.500	0
Indirect cost	929.063.4	601.931.93	327.131.47
Every operation action cost	7.910.986.4	7.583.854.93	327.131.47
Total patients	1.156	1.155	0
The cost per action			
Operation in 2014	**9.137.189.292**	**8.759.352.444.15**	**377.836.847.85**
total cost per operation action,			
Minor,Medium and major	**19.961.193.726.8**	**19.679.666.430.11**	**281.527.290.89**
Operation in 2014			

Source : made by writer

CONCLUSION AND SUGGESTION

Based on the description and discussion of the previous chapter, it is concluded that:

1. Cost information generated by the conventional cost accounting used by Royal hospital Surabaya in setting the tariff of operational action services is a distorted cost information, conventional cost accounting imposes an indirect cost to one operation, based on only one

tariff, improper charge charges, as each type of service consumes indirect costs with different consumption ratios.

2. Activity based costing system (ABC) differentiates the indirect costs to one service operation action, based on the activities that incur indirect costs required in the operation of such operations. Indirect charge loading is done using three cost drivers, which are the number of hours of direct labor, the number of employees, and the number of patients. The ABC system improves the costing of the traditional cost accounting system by considering that each product or service consumes indirect costs with different consumption ratios. By using more cost drivers, the cost of charging for products or services becomes more accurate

3. Traditional cost accounting that has been used by Royal hospital Surabaya needs to be considered further. This is because the current cost information is less accurate. The ABC system can be considered as a better attenuation to analyze costs, as it allows management to make more correct decisions.

4. Royal Hospital Management understands that in implementing the new system requires additional cost, more time and high commitment. Therefore, the management should analyze the costs and benefits first before implementing the ABC system

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Dividend Policy and Share Price Fluctuations of Sampled Quoted Nigerian Companies

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ABSTRACT

This focus of the study was to find out the impact of dividend policy on market price of shares on sampled quoted companies in Nigeria. Secondary data were sourced from the audited annual reports of ten selected companies, the prices from Central Security Clearing System's portal (CSCS) and annual returns on Nigeria Stock Exchange All Share Index-NSEASI from Proshareng.com for the period of 2011 to 2015. The data were analysed by the use of ols regression technique to find the level of significance of the variables: dividend payout ratio earnings per share and economy status on share price of sampled companies in Nigeria. The findings revealed that dividend payout ratio and earnings per share have significant effects on share price of equity while the economy status has insignificant effect on the share price of equity. The study also showed that earnings per share has a higher effect than dividend payout ratio and economy status of the country on market price of share of sampled companies in Nigeria during the period under review. It is recommended that in this recession period, risk averse investors should focus on high dividend payout ratio equities, however they should be careful of these stocks because it means the companies may not have enough retained earnings to invest in profitable investments.

Keywords: Dividend; Dividend Policy; Earnings per share; Share price; Status of the economy.

INTRODUCTION

Dividend policy decision is the most controversial of the three areas of financial decision makings. It is the third of the major categories of long term decisions. The objective of dividend policy should be to maximize the wealth of the shareholders (Pandey, 2015; Lumby and Jones,2011). To maximize the shareholders 'wealth, dividend payments were assumed to be the rights of the shareholders (Ordu, Enekwe and Anyanwaokoro, 2014). On the contrary, dividend payments reduced the companies' retained earnings and have an effect on investment policy. Dividend policy's impact on share price has been a major issue in corporate finance. The complication and confusion surrounding dividend policy is because it is linchpin to both investment and financing decisions (Lumby and Jones,2011) .While some believed that dividend payout does not have any meaningful impact on the market price of share (Hussainey, Mgbame and Chijoke-Mgbame (2011) while others are of the opinions that dividend payment has a very serious influence on the share price (Hasan and Karim ,2013; Wang and Gui ,2015; Oyinlola and Ajeigbe ,2014).

The focus of this study was to find out the impact of dividend policy on market price of shares on sampled quoted companies in Nigeria. From the investors' perspective, shares are purchased in the anticipation of two forms of returns: regular incomes from the payment of dividends and capital gain when the shares are sold at some date in the future. The problem of

dividend decision can be framed in the form of two questions; does the dividend policy over a period of time affect the share price of equity's capital, and is it only dividend policy that affects the price fluctuation of shares. For the companies, dividend decision problems can either be financing or allocation problems that is how the net profit after interest and tax are to be allocated between dividend payment and retention within the companies for reinvestment (Kajola, Adewunmi & Oworu, 2015).

LITERATURE REVIEW

Theoretical Review

According to Pandey (2015), different theories have been propounded on whether dividend policy decision is relevant or irrelevant with Myron Gordon, James Walter, among others are associated with the relevance of dividend policy hypothesis while Modigliani and Miller are associated with the irrelevance of dividend policy hypothesis (Kajola, Adewunmi & Oworu, 2015). Walter argued that the choice of dividend policies almost affect the value of the firm. His model is based on the relationship between the firm's rate of returns and its cost of capital. With respect to Gordon' model, the market value of the firm is equal to the present value of infinite stream of dividends received, that is the investors are risk averse and would prefer dividend today to future dividends (Bird- in-the- hand argument). The conclusions of both models about dividend policy are similar; the dividend policy depends on whether the firm is a growth or mature firm. Both models suffers from the same limitations such as the assumptions on which they are based that is no external financing, constant returns and constant cost of capital, which are not true in real life.

Another hypothesis supporting the relevance of dividend policy is dividend signalling hypothesis which states that dividend are relevant because they have informational value that announcement of dividend convey information/signal about the future earnings of the company. Bhattacharya in 1979, John and William, Miller in 1985 and Rock in 1985 showed that, in a world of asymmetric information, better informed insiders (Management) use dividend policy as a signal to convey their firm's future prospect to less informed outsiders (Vieira and Raposo, 2007).This hypothesis implies that the optimum dividend policy is the one that provide information that cannot be effectively communicated through any other means.

Modigliani and Miller do not agree with the view that dividend affect market value of shares; they argue that the value of the form depends on the firm's earning that result from its investment policy (Pandey,2015). The assumption on which the hypothesis is based is not always valid such as perfect market situation, no taxes and transaction cost. Due to the unrealistic nature of its assumptions, MM lacks practical relevance.

Empirical Review

Hussainey, Mgbame and Chijoke- Mgbame (2011) in using multiple regression analysis to examine the relation between dividend policy and share price change in the UK stock market The findings revealed that there is a positive relationship between dividend yield and stock price changes and a negative relationship between dividend payout and stock price changes and that firm's growth rate, debt level, size and earnings explain stock price changes. Wang and Gui (2015) stated in their study on 16 listed banking companies in China Stock Exchange for the period of 2008-2012 .The research was carried out to inspect the relevance of dividend policy with the fluctuation of stock price and transaction volume to prove that dividend policy is an efficient mechanism for information transmission. The findings showed that the dividend policy has a significant impact of the fluctuation of stock market and that the dividend policy can transmit the future information about the company which complies with signal transmission theory.

Al-Hasan, Asaduzzaman and Al Karim (2013) in their work on the effect of dividend policy on share price (an evaluative study) in Bangladesh found out that there is a significant effect of dividend policy on share which support the relevant theory of dividend policy. The study was carried out on 28 companies (four industries) based on secondary data and analysed using descriptive statistic, correlation and multiple regression model. Al Masum (2014) in another study on dividend policy and its impact on stock price using panel data approach stated that the dividend policy has significant effect on stock prices. The study was carried out on thirty banks listed in Dhaka stock Exchange in Bangladesh for the period of 2007-2011.

According to Ordu, Enekwe and Anyanwaokoro (2014) in their study on effect of dividend payment on the market prices of shares. The study was carried out on 17 quoted firms using time series on dividend per share and dividend payout ratio for the period ranging between 2000 and 2011 .The model specification used was ordinary least squares technique applied as panel estimation. The finding revealed that there was a positive effect between market price and dividend per share confirming that a rise in dividend per share will bring about an increase in the market price of quoted firms. In their study on dividend policy and corporate performance in Nigeria, Adediran and Alade (2013) discovered that there is a significant relationship between dividend policy and profitability, dividend policy and investments and dividend policy and earnings per share. Data were extracted from annual reports of twenty five companies listed on the Nigerian Stock Exchange and were subjected to regression analysis.

According to Adesola and Okwong (2009),the main determinant of market share price of Nigeria are current dividend and earnings per share .This conclusion was based on the empirical review of dividend policy of quoted companies in Nigeria for the period of 1996-2006. Oyinlola and Ajeigbe (2014) in their study conducted on twenty two companies listed on Nigerian Stock Exchange using secondary data on the firms' fundamentals in their respective annual reports from 2009-2013. Regression analysis, Correlation analysis and Granger causality test were used to test research hypothesis on 110 observations .The findings revealed that both dividend payout and retained earnings are significantly relevant in the market price per share of the companies.

Types of Dividends
In Nigeria, there are companies with high payout ratio, moderate payout ratio and low payout ratio. The current state of economy, recession has forced many companies to cut out dividend payment to investors as a way of building up their retained earnings to weather the recession storm (Proshare, 2016).

According to CAMA (1990), Section 380, subject to a company being able to pay its debts as they fall due, the company can only pay dividends out of the following profits (profits arising from the use of the company assets, revenue reserves, net realised profits on the assets sold). Section 19 of Company income Tax Act (CITA) imposes what is generally known as excess dividend tax. A company that pay dividend out of profit on which no tax is payable due to no taxable profit (loss) or taxable profit is less than the amount of dividend paid, the company shall be liable to tax at 30% as if the dividend is the taxable profits of the company for the year of assessment to which the accounts out of which the dividend declared relates.

RESEARCH METHODOLOGY

Area of Study

The purpose of this research was to evaluate the impact of dividend policies on market price of shares on sampled quoted companies in Nigeria. The period of study was from 2011-2015 with reference to ten selected firms listed on Nigeria Stock Exchange.

Theoretical Framework

The study was hinged on the framework of relevant dividend theory advocated by the likes of Gordon and Walter. Investigating the impact of dividend policy on market price of shares on sampled companies in Nigeria based on the proposition of the argument that dividend payout of a firm is a factor to be considered in the valuation of stock. From the standpoint of the relevance dividend theory, dividend decision problems can either be financing or allocation problems that is how the net profit after interest and tax are to be allocated between dividend payment and retention within the companies for reinvestment.

Model specification

The model adapted for this study was Oyinlola and Ajeigbe (2014). The model is stated below:

$$PPS_t = f(DPR_{t-1}, RETR_{t-1}) \dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

The above function is econometrically stated below:

$$PPS_t = \beta_0 + \beta_1 DPR_{t-1} + \beta_2 RETR_{t-1} + \mu t \dots\dots\dots\dots (2)$$

Where
PPS_t = Stock price of the Current year
DPR_{t-1} = Dividend payout ratio of previous financial year
$RETR_{t-1}$ = Retained Earning ratio of previous financial year
β_0 = Constant
β_1, and β_2 = Coefficient or parameter of the Explanatory variables
μ_t = error term

The modified model is stated below:

$$PPS = f(DPR, EPS, ECO) \dots\dots\dots\dots\dots\dots\dots\dots(3)$$
$$PPS = \beta_0 + \beta_1 DPR + \beta_2 EPS + \beta_3 ECO + \mu_t \dots\dots\dots (4)$$

Where
PPS = Ex div Stock price
DPR = Current Dividend payout ratio
EPS = Current Earnings per Share
ECO = Status of the economy (proxy by Annual returns on NSEASI)
β_0 = Constant
β_1, and β_2 = Coefficient or parameter of the Explanatory variables
μ_t = error term

Definition of variables

Dividend payout ratio (DPR)

It is the proportion of earning paid to shareholders relative to total earnings declared by the company. The proportion of the earning that is not paid is called retained earnings.

Earnings per share (EPS)

It is the monetary value of earning per outstanding share of equity shareholder for a company. Status of the economy (ECO-Proxy by annual returns on Nigeria Stock Exchange All Share Index-NSEASI).

The capital market in many countries provide the barometer by which the economy is measured, although the Nigeria capital market does not fully reflect the size of the economy, any expansion or contraction in the economy is first recognised on the exchange The stock market performance serves as the indicator of the overall health of the economy.

A-priori Expectation

The theoretical expectation of the direction of the impact of explanatory variables like dividend payout ratio on share price fluctuation is positive, which connote that the higher the dividend payout ratio, the higher the market price per share while the expectation of earning per share and economy on share price fluctuation is also expected to be positive.

Source of Data Collection

This study made use of secondary data sourced from the audited annual reports of ten selected companies, the prices from Central Security Clearing System's portal (CSCS) and annual returns on Nigeria Stock Exchange All Share Index-NSEASI from Proshareng.com. Data collated in the study covered a period of five years for ten quoted firms on Nigeria Stock Exchange.

DATA PRESENTATION AND ANALYSIS OF RESULT

Results

Methods of Data Analysis.

In the quest to attain the objectives predetermined in the research work and to provide answers to those research questions raised, the study made use of Analysis of variance (ANOVA) to analyse the data collected.

DATA PRESENTATION AND ANALYSIS OF RESULT

Results

Table 1: Correlation coefficient Matrix

	PPS	DPR	EPS	ECO
PPS	1.000			
DPR	0.403	1.000		
EPS	0.930	0.404	1.000	
ECO	0.054	0.014	0.340	1.000

Table 2: Result of OLS Regression

Variable	Coefficient	Std.Error	t-statistic	prob
Constant	1.411	20.847	0.068	0.946
DPR	0.203	0.361	0.563	0.576
EPS	0.276	0.018	15.531	0.000
ECO	0.198	0.473	0.419	0.677
R-squared	0.866			
Adjusted R-squared	0.858			
F-statistic	99.321			
Prob(F-statistic)	0.000			

FINDINGS AND DISCUSSION

Table 1 revealed that there is a positive correlation among dividend payout ratio, earnings per share and share price. The result showed the correlation coefficient of 0.40 for dividend payout ratio and market price of share, 0.93 for earnings per share and share price and 0.05 for economy status and market price of share. This implied that dividend payout ratio and share price, earnings per share and share price move in the same direction, as one variable increases, the other also increases with the strength of their relationship as shown in the magnitude of correlation coefficient.

The result of regression analysis as presented in Table 2 showed that an increase in earnings per share will lead to 0.20 increases in share market price while an increase in earnings per share will lead to 0.28 increases in market price of share. Dividend payout ratio and Earnings per share have significant effects on share price of equity while the economy status has insignificant effect on the share price of equity. However, dividend payout ratio, earnings per share and economy status could only explained 86% of the systemic variation in market price of share while about 14% of the systemic variation could not be accounted for by the regression model. The model passed the test of good fit given the value of F-statistics of 99.321 with its associated probability of 0.000 which is lower than 0.05.

It is seen that earnings per share has a higher effect than dividend payout ratio and economy status on market price of share of sampled companies in Nigeria for the period under review. This finding is consistent with Adesola and Okwong (2009) that impact of earnings per share on market price value is greater than dividend payments.

CONCLUSION AND RECOMMEDATION

This focus of the study was to find out the impact of dividend policy on market price of shares on sampled companies. The results revealed that earnings per share have a higher impact on market price of share of sampled companies in Nigeria. This finding is line with Adesola and Okwong (2009)'s study. It is also confirmed that dividend payout and earnings per share have significant impact on the fluctuation of share prices of companies in Nigeria. It is recommended that risk averse investors should focus on high dividend payout ratio equities in this recession period, however they should be careful of these stocks because it means the companies may not have enough retained earnings to invest in profitable investments.

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A Rough Diamond: The Perils of the Kimberley Process

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ABSTRACT
The purpose of this investigation is to determine the impact that the Kimberley Process has on diamond trade, diamond merchants, paramilitary groups, and governments throughout the world. The research question was whether the Kimberley Process is effective in combatting the sale of conflict diamonds in Africa. The investigation reached a conclusion that the Kimberley Process is an ineffective vehicle for the combat of the conflict diamond trade and that the existing process should be changed to provide greater enforcement and oversight. Suggestions are offered for improvements to the Kimberley Process Certification Scheme that would mitigate its shortcomings and ultimately regulate the mining and trade of conflict diamonds.

Keywords: conflict diamonds, international, African nations, Kimberley Process

INTRODUCTION

Scholars from various disciplines from business and criminology to transnational law have long noted the contentious issues of civil war over control of rich mineral fields, particularly diamond mines, in several African nations [14, 2, 4, 20, 7]. According to the non-governmental human rights organization, Global Witness, conflict diamonds are defined as, "diamonds that are used to fuel violent conflict and human rights abuses" [www.globalwitness.com]. In the 1990s, conflict diamonds were responsible for funding rebel groups throughout southern and western Africa. Nations such as Liberia, Sierra Leone, Angola, the Democratic Republic of Congo, and Côte d'Ivoire all suffered through damaging wars stemming from diamonds. The mines were hotbeds of violence, where citizens were subject to inhumane treatment. Many civilians were forced to work in the mines, where rape, murder, and harsh punishments were commonplace. The stones that were mined and sold allowed the military groups to buy weapons and increase their power over African villages. Indeed, Mullins and Rothe [14] note that the main driver was control of mineral fields, and the resulting violence was underwritten by many transnational corporations.

In the late 1990s and early 2000s consumers became aware of the atrocities that surrounded their diamonds from news stories, humanitarian organizations, and even feature films. Consumers wanted to be sure that their precious gems were not conflict diamonds. Perry and Mavhunga [18, pg. 52] explain, "A jeweler will tell you a diamond's price is based on the four C's: carat, clarity, color and cut. But as a commodity, diamonds' value lies in their association with beauty, prestige and marriage. If they are linked instead to crime, war or starving orphans, customers won't buy them."

To combat the blood diamond issue, governments around the world worked together to create the Kimberley Process in 2003. The structure is aimed at preventing the sale of conflict diamonds, thus ending the struggle between rebel groups and established African governments. Global Witness, one of the creator organizations of the Kimberley Process, describes the system as "an import-export certification scheme, which requires participating governments to certify the origin of rough diamonds, and put in place effective controls to prevent conflict stones from entering the supply chain" [www.globalwitness.org]. Spinks [21 pg. 10] describes the Kimberley Process Certification Scheme, or KPCS, as "three-pronged," which includes civil-society coalitions, such as Global Witness, participating governments, and industry representatives. While the organizers of the Kimberley Process were hopeful that positive changes would occur, Burkhalter [5] explains that the self-enforced process causes some concern amongst many in the diamond trading community. Further, Beevers [2, pg. 233] notes that even with efforts to restructure the diamond sector, it remains corrupt with "a vast majority of the benefits accruing to a small group of sponsors, dealers, and foreign entities."

Indeed, the Kimberley Process has many critics [19, 2, 4], some of which are founding group members. For example, Global Witness exited the organization in 2011 due to the Kimberley Process' failures and lack of progress [www.globalwitness.org]. The goals of the Kimberley Process have not yet been achieved, and rebel groups continue to harvest and sell conflict diamonds in Africa today. To achieve these goals, and ultimately eliminate the paramilitary groups' source of income, three key changes need to be made to the Kimberley Process. The loopholes that prohibit compliance should be eradicated and the Kimberley Process' definition of blood diamonds and their decision making model should be changed. Further, the Kimberley Process should be administered by a different organization capable of greater oversight and enforcement.

SHORTCOMINGS OF THE KIMBERLEY PROCESS

In 2010, a controversy surrounding the country of Zimbabwe in southern Africa made for a difficult decision for the officials of the Kimberley Process. President Robert Mugabe was the head of a corrupt and oppressive Zimbabwean regime, and used conflict diamonds to maintain power and control. Perry and Mavhunga [18] explain that when civilians found billions of dollars of diamonds in the Marange field along the border of Mozambique, Mugabe found a source of income to keep him in office. Spinks [21, pg. 9] notes that rich diamond deposits in this region "have an estimated worth of up to US $800 billion." Soldiers of Zimbabwe's army took control over the valuable mines, with civilians as their laborers. These soldiers were responsible for numerous human rights abuses, including murder and rape. Perry and Mavhunga [18] indicate that the funds earned from the sale of the Marange diamonds were estimated at around US $1.7 billion, sufficing Mugabe's need.

However, when Zimbabwe was suspended from the Kimberley Process for the killings in the Marange mines, they found another way around the issue. They circumvented the process by threatening to sell their diamonds on an illicit market, which rendered the Kimberley Process helpless. According to Global Witness, "This has damaged the scheme's credibility and dented consumer confidence" [www.globalwitness.org]. Further, Hilson and Clifford [7, pg. 432] describe the Kimberley Process as allowing conflict diamonds to be traded under a "façade of legitimacy" in the Marange area. One of the critical failings of the scheme is its negligence in requiring the industry to take responsibility for the entire supply chain [22].

The situation in Zimbabwe was a delicate issue for members of the Kimberley Process. If Zimbabwe were to leave the Kimberley Process, enforcement would be impossible and the

horrendous practices would continue, likely spreading to other mining regions. This would also serve as an example to other nations that it is not difficult to navigate around the Kimberley Process and still be able to profit from conflict diamonds. Bates [1], "if Zimbabwe successfully sells its diamonds after leaving the Kimberley Process, that would leave it all but dead." Bates [1] further explains that non-governmental organizations would have little access to the mines, creating a less than ideal scenario for innocent Zimbabwean families associated with diamond mining. Although the decision to allow Zimbabwe to remain a member of the Kimberley Process was far from perfect, it was the only viable option considering the flaws of the certification scheme and its enforcement. Had the members cut ties with Zimbabwe, negative consequences would have been seen in the nation's mines and more conflict diamonds would appear in jewelry stores around the globe. Zimbabwe exposed essential elements of the Kimberley Process that are flawed and signaled that extensive changes are needed.

One of the flaws in the process stems from the fact that the Kimberley Process only refers to rough diamonds. This loophole could be eliminated with a change in the wording of the Kimberley Process Certification Scheme. Burkhalter [5, pg. 1] describes this flaw as, "The certification scheme regrettably applies only to 'rough,' uncut diamonds. Mined diamonds that have been crudely cut or affixed to a cheap earring could evade the control mechanism". Rebel groups can trade cut diamonds without the oversight of the Kimberley Process. By encompassing all diamonds, whether rough or cut, the Kimberley Process would more effectively combat the conflict diamond issue.

Another drawback of the Kimberley Process is that only 75 countries are members. Major African countries, such as Mozambique, do not hold membership [8]. Without the participation of key nations, the Kimberley Process will remain ineffective, and countries not included will continue to smuggle and trade conflict diamonds with other nations.

Furthermore, not all of these countries report their statistics. Perry and Mavhunga [18] report that Venezuela, for example, has not reported their information to the Kimberley Process officials since 2005. Then, in 2008, Venezuela suspended their imports and exports of rough diamonds, and claimed to have stopped production. However, the Global Witness reports that Venezuela continues to mine and trade diamonds. To do this, Venezuela smuggles them to surrounding countries, such as Brazil and Guyana, for certification [www.globalwitness.org]. The situation in Venezuela illustrates that participants in the Kimberley Process are not willing to conform to the guidelines and that the Kimberley Process officials are not willing to go to adequate lengths to ensure that diamonds are traded within the constraints of the certification scheme. Venezuela serves as an example to other nations that membership in the Kimberley Process is not necessary to profit from the sell of diamonds, setting a precedent for other countries frustrated with the controls of the certification scheme. In a recent unprecedented action, the 2016 Chair of the Kimberley Process published a mid-term report highlighting on-site visits to major diamond producing nations of Africa [9]. Also discussed in the document was a visit to Venezuela where the Chair met with country officials to seek readmission. Venezuela was subsequently approved to rejoin the Kimberley Process membership.

The Kimberley Process' decision-making procedure is another concern. Its consensus model makes it difficult for any decision to be made [4]. With 75 countries participating, just one objecting party could override a potentially advantageous change [www.kimberleyprocess.com]. Global Witness calls on the Kimberley Process to revise its model by advocating that it "replace its decision-making procedure with a more effective system" [www.globalwitness.org].

The Kimberley Process, which only encompasses diamonds that fund rebel groups, does not confront established governments that are already in place. This problem was evident in the Zimbabwe situation as well. Instead of a rebel army, it was Mugabe's forces that manned the mines and killed, raped, and abused countless civilians. Because of this, the Kimberley Process was caught in the middle of a serious political situation, with potentially damaging implications to the entire scheme.

The Zimbabwe conflict is a prime example of the problems that surround many African nations today. Since many countries are only now ending civil wars and conflicts between tribal groups, the established governments are weak and unstable. The governments thus have defenseless controls over diamond imports and exports [4]. In order for the Kimberley Process to be effective as it stands now, it needs the cooperation and enforcement of every member nation.

To prevent situations such as this in the future, the Kimberly Process must include all governments, not just rebel groups in its certification scheme. All groups committing human rights abuses, like Robert Mugabe's army in Zimbabwe, must be held accountable if conflict diamonds are to be eliminated from the world scene. Bruffaerts [4] notes that those opposing a redefinition of the Kimberley Process believe that human rights issues lie under the purview of the United Nations.

Undoubtedly, the Kimberley Process' definition of 'conflict diamond' is a stumbling block on the road to achieving a world without conflict diamonds. Smillie [20] notes that the Kimberley Process definition has solely focused on the use of diamonds to fund rebel armies, and, as such, does not capture abuses by governments or corporations. The United Nations defines conflict diamonds as: "Diamonds that originate from areas controlled by forces or factions opposed to legitimate and internationally recognized governments, and are used to fund military action in opposition to those governments, or in contravention of the decisions of the Security Council" [www.un.org], which only deals with diamonds held by rebel groups, not legitimate governments. When the Kimberley Process was first enacted, this definition was adequate, but with new challenges, it must be widened. Even the United States' chair of the Kimberley Process, Gillian Milovanovic [13], agrees that the definition must change. In an interview with CNN's Robyn Curnow, Ms. Milovanovic stated, "One of the things which will certainly be looked at and which we certainly support looking at and believe should get a close look is whether that definition is still sufficiently encompassing or appropriate given today's challenges." With the widening of the definition, the Kimberley Process could appropriately confront countries with legitimate governments, rather than only rebel movements.

Further, the diamond companies themselves have little incentive to participate in the Kimberley Process, other than the ability to market its diamonds as "clean". Jewelry companies are principally concerned with the sale of their product.   As long as companies can successfully market their diamonds as clean, even though they may have been smuggled conflict diamonds, they will continue to purchase their gems from the same sellers.

One diamond company in particular has a significant investment in the Kimberley Process. The De Beers group operates a large family of companies, creating a near monopoly. Bhaskar [3] explains that De Beers dominates the sale of diamonds worldwide, currently controlling around 60% of the global trade. De Beers has historically used their influence to manipulate the market, forcing many independent diamond sellers out of business, as Kretschmer [10] explains. The company has also been linked to diamond violence in Botswana, leading the

human rights organization Survival International to classify the actions as genocide, Leithead [11] reports. Interestingly, De Beers was instrumental in the founding of the Kimberley Process.

The motives and practices of De Beers are highly questionable, especially considering the preferential treatment the group enjoys from the Kimberley Process Certification Scheme. The Kimberley Process does not require De Beers to mention the sources of their gemstones. Bhaskar [3] explains that, "this group labels the source as being 'mixed', without any clear proof of origin." Although De Beers operates their own mines throughout Africa, the true origins of their stones on the market are completely unknown. This practice is contrary to the mission of the Kimberley Process and undermines the spirit of the certification scheme.

Yet another problem with the Kimberley Process deals with the regions in which diamonds are mined. Diamonds are most plentiful in nations such as Zimbabwe (as previously mentioned), the Democratic Republic of the Congo, Sierra Leone, and Angola. These nations all had violent wars within the past few decades. These struggles left them with weak governments and few internal controls to regulate the diamond trade. As Smilie conveys to Melik [12], the Kimberley Process is severely disadvantaged in nations with already lax gem management. Smilie explains the situation in the Democratic Republic of the Congo, saying, "the government in Congo has no idea where 40% of its diamonds come from - they could be coming from Angola or Zimbabwe or even from Mars" [12]. When conflict diamonds are smuggled, the governments cannot effectively trace them back to their true origins, instead passing them off as mined cleanly.

Enforcement is a key issue preventing the effectiveness of the Kimberley Process Certification Scheme. However, the participants could easily institute quality checks that definitively provide the true origin of the diamond. Bhaskar [3] explains that every diamond has a distinctive "footprint." By analyzing the "granular structure of roughs", laboratories can identify the mines from which the gems originated. This practice would ensure that diamonds truly came from the regions that the sellers claim. Further, laboratory testing would prevent the sale of smuggled diamonds, which is one of the many loopholes of the Kimberley Process.

However, many scholars, including Bhaskar [3], wonder why the Kimberley Process has not already instituted such a practice. The reasons trace back to the De Beers group and their interests. As previously mentioned, De Beers is not required to report the origins of their stones, leading many to believe that the company is engaging in unethical mining and purchasing, allowing the company to retain their control over the African diamond market. Bhaskar [3, www.dnaindia.com/money] states that, "by refusing to adopt such a technique, there is increasing discomfort that the Kimberley Process Certification Scheme route is being used to force African countries to adopt norms that are found acceptable to De Beers." Greater enforcement and control over the Kimberley Process Certification Scheme would require the membership to sever ties with De Beers, allowing for a more objective view of the diamond trade.

With no international law in place, the Kimberley Process is the only vehicle that attempts to regulate the trade of diamonds. In a 2012 interview by Stoddard and Ferreira-Marques [22], Dunnebacke, a staffer at Global Witness, eludes that if a country is deemed to be selling conflict diamonds, there is virtually no enforcement in place. The only repercussions a nation would face are sanctions placed on them by the Kimberley Process. As Zimbabwe showed the world during the Marange incident, threatening to sell diamonds on the illicit market is an effective strategy against the minor consequences used by the Kimberley Process officials. Mugabe's

stern approach rendered the Kimberley Process helpless in the face of a threat. The Kimberley Process must create stricter, harsher punishments for nations and leaders who knowingly defy the parameters of the certification scheme. In an interview by Stoddard and Ferreira-Marques [22, www.reuters.com], Simon Ranier, chief executive of the British Jewelers' Association notes, "What is needed is an additional process that stops elected governments from using diamonds in conflict against their own people."

Indeed, even member nations of the Kimberley Process stress the importance of greater enforcement [16]. In a report submitted to the 2010 Kimberley Process Certification Scheme Plenary in Jerusalem, Partnership Africa Canada, along with the governments of Canada and the United States, outlined several different ways, both multilaterally and nationally, that the Kimberley Process could bolster its enforcement. However, the report also included a harsh criticism of the Kimberley Process's current enforcement procedures, explaining that the Kimberley Process has done little to address practices such as money laundering and corruption within its own enforcement bodies [16]. It goes on to suggest that the Kimberley Process introduce new enforcement arrangements to deal with the ongoing smuggling and selling of conflict diamonds [16].

In order for the Kimberley Process to be effective in combatting the conflict diamond issue around the globe, it must be administered and enforced by a different body. Instead of having its own regulatory group, the Kimberley Process needs to be administered by the United Nations. This way, it will be respected around the world and all United Nations members will be included. The United Nations would have a stronger enforcement agency and would be better suited to monitor a large-scale issue such as this. Hilson and Clifford [7, pg. 435] note that "the central criticism of the initiative is that it is voluntary: that, as a soft law, it is founded upon a series of guarantees by government authorities for which it is unclear what penalties, if any, will be applied to transgressors, aside from possible expulsion from the KPCS." The Kimberley Process has no real consequences for member nations who defy the trading policies. Thus, nations who are not in accordance with the process receive little more than a slap on the wrist. However, if the Kimberley Process was enforced directly through the United Nations, more severe punishments would become a reality.

CONCLUSION

Onuzulike [15] notes that few parties involved with the Kimberley Process are blameless and significant modifications to the process are needed. Further changes to the definition of 'conflict diamond' and the decision-making procedure are essential to strengthening the Kimberley Process. The loopholes allowing for established governments to continue production even though they are committing human rights violations must be eliminated. The certification scheme should incorporate new methods of investigation, ensuring the true origins of diamonds tagged as clean. In order to regulate the process, all diamonds and diamond merchants should be subject to random checks of origin. Additionally, the enforcement of the Kimberley Process should be through the United Nations, so that more countries would be included and that deterrence would be increased significantly through harsher consequences. If these changes were brought to life, the Kimberley Process would be a viable option to eliminating conflict diamonds in the trading market around the globe. However, the question remains whether or not the Kimberley Process will adapt to new challenges or continue to be ineffective in combating conflict diamonds.

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Empirical Regularities of Nigeria's Foreign Private Portfolio Investment Return and Volatility

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ABSTRACT

This paper examined the Empirical Regularities of Nigeria's Foreign Private Portfolio Investment Return and Volatility. The study covered the periods between 1981 and 2014. An EGARCH model was specified. The analysis involves carrying out the tests for Financial Assets and Risk assumptions. The study revealed that Foreign Private Portfolio Investment Returns show Volatility clustering. Secondly, Foreign Private Portfolio Investment Return and Risk were found to have Thick tail. Variance Ratio Test [VRT] was used to test the weak form efficiency of the efficient market hypothesis and hence the non-predictability of financial markets. The Results showed that changes in one direction are more often followed by similar changes in either direction (volatility clustering). Given that Nigeria's Foreign Private portfolio investment empirical imperatives is regular like that of the rest of the world, the paper thus recommends that investment decision models used by advanced analyst in developed countries can be applied to developing countries like Nigeria with little modification with respect to Foreign Private Portfolio Investment as their assets and risks display similar characteristics with assets and risks in developed countries.

Keywords: Empirical Regularities, Foreign Private Portfolio Investment Return and Volatility,

INTRODUCTION

In a paper titled "Principal Component analysis of Nigeria's Foreign Private Portfolio Investment (FPPI) volatility", Ndugbu, Ihejirika and Ochiabuto (2017) asserted that the decisive test to classify a purchase as investment is whether there is a "potential to turn return". The statement "potential to turn return" enfolds potential to turn losses. Succinctly, they inferred that investments are volatile.

Their study examined Foreign Investment Explicit Volatility and Volatility Theories and thus revealed that Foreign Private Portfolio Investment volatility proxy by ten key risks factors can be de – parameterized to Six (6) Principal components using the Kaiser's criterion and Cattell's scree test. These six components were selected as they were heavily affected by factors which are not common to all the other risks. The names of the extracted principal components were Taxability risk, Liquidity risk, Economic Risk, Political Risk, Commodity risk and Market risk.

The researchers admitted that the Principal Components have much implication and that these key Components can be used for further analysis. Hence, the objective of this paper is to use

the Principal Components of Nigeria's Foreign Private Portfolio Investment volatility to examine the Empirical Regularities of Nigeria's Foreign Private Portfolio Investment Return and Volatility.

REVIEW OF RELATED LITERATURE

Review of Concepts

Foreign Investment

Foreign investment involves capital flows from one country to another, granting extensive ownership stakes in domestic companies and assets (Investopedia, 2016). Foreign investment is largely seen as a catalyst for economic growth. Foreign investments can be classified in one of two ways: direct and indirect. There are two additional types of foreign investments: commercial loans and official flows. Commercial loans are typically in the form of bank loans that are issued by a domestic bank to businesses in foreign countries or the governments of those countries. Official flow refers to different forms of developmental assistance to a developed or developing nation given by donor countries.

Foreign direct investment is investment made by a company or entity based in one country, into a company or entity based in another country. Entities making direct investments typically have a significant degree of influence and control over the company into which the investment is made. The accepted threshold for a foreign direct investment relationship, as defined by the Organization for Economic Co-operation and Development (OECD), is 10% (OECD, 2008). The foreign investor must own at least 10% or more of the voting stock or ordinary shares of the investee company. Foreign portfolio investment (FPI) consists of securities and other financial assets passively held by foreign investors. FPI does not provide the investor with direct ownership of financial assets, and thus no direct management of a company. This type of investment is relatively liquid, depending on the volatility of the market invested in.

Rate of Returns on International Investments

Rate of return is profit on an investment over a period of time, expressed as a proportion of the original investment. A loss instead of a profit is described as a negative return. The time period is typically a year, in which case the rate of return is referred to as annual return. Return on investment (ROI) is return per naira invested. Ready Ratios (2016) explicate ROI as a performance measure used to evaluate the efficiency of investment. It is a measure of investment performance, as opposed to size (c.f. return on equity, return on assets, return on capital employed). The return or rate of return can be calculated over a single period, or where there is more than one time period, the return and rate of return over the overall period can be calculated, based upon the return within each sub-period.

Empirical Regularities of Financial Asset Return and Volatility

News in financial market can be seen from dimensions of non-trading periods, forecast able events and asymmetric effects. Non-trading period news refers to Information that accumulates when financial markets are closed as reflected in prices after the markets reopen. Fama (1965) and French and Roll (1986) found that information accumulates more slowly when the markets are closed than when they are open. Variances are higher following weekends and holidays than on other days, but not nearly by as much as would be expected if the news arrival rate were constant.

Forecast able events news refers to announcement effects. Forecast able releases of important information are associated with high ex ante volatility. For example, Cornell (1978) and Patell and Wolfson (1979, 1981) showed that individual firms' stock returns volatility is high around earnings announcements. Similarly, Harvey and Huang (1991, 1992) found that fixed income

and foreign exchange volatility is higher during periods of heavy trading by central banks or when macroeconomic news is being released. For example, volatility is typically much higher at the open and close of stock trading than during the middle of the day. Trading and non-trading periods contribute differently to volatility.

The effect of good news and bad news may have asymmetric effects on volatility. In general when negative news hits a financial market, asset prices tend to enter a turbulent phase and volatility increases, but with positive news volatility tends to be small and the market enters a period of tranquility.

Leverage effect or asymmetric term first noted by Black (1976), refers to the tendency for changes in stock prices to be negatively correlated with changes in stock volatility. Fixed costs such as financial and operating leverage provide a partial explanation for this phenomenon. A firm with debt and equity outstanding typically becomes more highly leveraged when the value of the firm falls. This raises equity returns volatility if the returns on the firm as a whole are constant. Black (1976), however, argued that the response of stock volatility to the direction of returns is too large to be explained by leverage alone.

Amplitude of return as Mandelbrot (1963) wrote . . . large changes tend to be followed by large changes, of either sign, and small changes tend to be followed by small changes.... Volatility clustering phenomenon is immediately apparent when asset return are plotted through time. The best known statistical model for the volatility-clustering phenomenon is the ARCH model (Robert M. Kunst and Johannes Kepler, 1997). According to Bo Sjö (2011) Volatility clusters mean that the variance appears to be high during certain periods and low in other periods.

"Persistence" of a shock to volatility: One perfectly reasonable definition of "persistence" would be to say that shocks fail to persist when shocks are stationary and ergodic. Nevertheless, apparent persistence of shocks may be driven by thick-tailed distributions rather than by inherent non-stationarity.

Review of Theories
Foreign Investment Theories
The Evolutionary Perspective
Views international investment as an ongoing, evolutionary process shaped by a Multinational Enterprise's (MNE's) international experience, organizational capabilities, strategic objectives, and environmental dynamics.

The Integration–Responsiveness Perspective
FDI is a complex process requiring coordinating subsidiary activities across national boundaries. Business people often talk about "thinking globally but acting locally." This theory establishes a framework. The framework, known as the global integration (I) and local responsiveness (R) paradigm (or the I–R paradigm), suggests that participants in global industries develop competitive postures across two dimensions.

Keynes investment theory
Keynes' main contention was that investment is a function of the prospective marginal efficiency of capital relative to some interest rate which reflects the shadow cost of the invested funds. According to Keynes (1936), because of incomplete and uncertain information about private investment volatility in the future, potential investors would depend on their

"animal spirits" in making their investment decisions rather than a rational calculation of an inherently intermediate distant future (Chete, 1998).

Tobin's "Q" theory of investment of 1969
This alternate formulation of the investment function postulates that the ratio of the market value of the existing stock of capital to its replacement cost (otherwise termed Q ratio) is the force driving investment. This is a disequilibrium approach to investment. In this respect, investment is a function of both profitability and output demand considerations.

The neoclassical theory
The term "Neo-classical Theory" refers to work done in the eighteenth and nineteenth centuries by classical economists such as Adam Smith, David Ricardo, and Irving Fisher. The neoclassical theory argues that places that offer the highest rates of return will attract the most capital. The theoretical explanation offered at that time was the neoclassical capital arbitrage theory of portfolio flows. Based on assumptions of perfect competition, absence of transaction costs, and perfect information, the neoclassical theory explained international capital flows as responding to interest rate differentials (Williamson, 1985)

The industrial organization approach
In the 1960s, neoclassical theory was questioned because it did not distinguish foreign direct investments from portfolio investments. Hymer (1960) was among the first to see that FDI could not be coupled with portfolio investments. According to Hymer (1960), in order to analyze foreign investment, one must first analyze the multinational enterprise which thrives on market imperfections. Foreign firms face greater risks in making investments than do domestic firms because different and unfamiliar laws, different languages and cultures, and possible discrimination add to the costs of firms investing abroad. Therefore, MNCs must have some advantage over competitors or other reasons to invest directly in a foreign country.

RESEARCH METHODOLOGY
Research Design
The research follows a non-experimental design. The research is an ex post facto research. This means that relationships are investigated after the fact has been known. The variables needed were specified viz. Foreign Private Portfolio Investment Return and the Principal Component Risks.

Sources of Data and Typology
The Data typology is a time series Data. The sample size for the analysis was determined judgmentally. The researcher looks at a set of data covering a period of 34 years from 1981 – 2014. The data were sourced from a previous paper titled "Principal Component analysis of Nigeria's Foreign Private Portfolio Investment (FPPI) volatility" (Ndugbu et al, 2017)

Tools of Analysis
The Finometric model in question is the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) – in mean sector I given by equation (1) and (2):

$$FPI_R = b_0 + Klog(h_t) + b_1AA + e_t \dots\dots\dots\dots\dots\dots 1$$

$$Log(h_t) = w + a_1|e^2_{t-1}/\delta_{t-1}| + b_2log(h_{t-1}) + re^2_{t-1}/\delta_{t-1} + a_2CR_t + a_3PR_t + a_4MR_t + a_5LR_t + a_6RR_t + a_7IR_t + a_8HR_t + a_9LR_t + a_{10}FIR_t + a_{11}KR_t + a_{12}TR_t + v_t \dots\dots\dots\dots 2$$

The second equation is fine tuned to encompass the Principal Components as follows:

$$\text{Log}(h_t) = w + a_1|e^2_{t-1}/\delta_{t-1}| + b_2\log(h_{t-1}) + re^2_{t-1}/\delta_{t-1} + a_2TR_t + a_3LR_t + a_4ER_t + a_5PR_t + a_6CR_t + a_7MR_t + v_t \quad .....3$$

Where

r – Asymmetric or Leverage effect.	$FPPI_R$ – ForeignPrivate Portfolio Investment Returns.
	K – Risk - return tradeoff.
AA – Asset Allocation.	e_t– Returns shock.
TR - Other Risk.	LR – Liquidity Exchange Rate Risk.
ER - Political Horizon Risk.	PR - Economic Longevity Risk.
CR - Market Risk.	MR – Market Ability Risk.
v – Risk shock.	δ_{t-1} – Lagged Standard error of Returns shock.
h_t- Implied volatility.	W – Average Return or Riskless Return.

GARCH-in-mean (GARCH-M) model provide three distinct specifications – one for the conditional mean equation, one for conditional variance, and one for conditional error distribution. The conditional variance is a function of three terms:

- a conditional term
- News about volatility from the previous period, measured by e^2_{t-1} (the ARCH term)
- Amplitude of return (the GARCH term)

Time series assumptions:
1. Variability in X values.
2. The construct is correctly specified.
3. Y and X are stationary random variables.
4. The errors are serially uncorrelated but not independent.
5. The number of observations n must be greater than the number of parameters to be estimated.

Empirical regularities of asset returns and risk
1. Leptokurtic: they tend to be thick tails.
2. Volatility clustering: large changes tend to be followed by large changes of either sign.
3. Leverage effect: tendency for changes in stock prices to be negatively correlated with changes in volatility.
4. Non - trading period's effect: when a market is closed information seems to accumulate at a different rate to when it is open.
5. Forecast able events: volatility is high at regular times such as news announcements or other expected events.
6. Inverse relationship between volatility and serial correlation.
7. Co – movement in volatility: volatility is positively correlated across assets in a market and even across markets.

Distributional assumptions
1. Normal (Gaussian) assumption.
2. Student t distribution {has degrees of freedom which allow greater kurtosis}.
3. Generalized error distribution (GED)

The objective of the paper is to test the empirical assumptions based on which Nigeria's Foreign Private Portfolio Investment Risk – Return is modeled. Hence, the tool of analysis involves carrying out the tests for these assumptions.

DATA PRESENTATION AND ANALYSIS

Data Presentation

The table array of variables needed for this analysis is presented in Appendix E.

Stationarity

A time series is not stationary if it has the following features:
- If it has time varying mean.
- Or if it has time varying volatility.
- Or both.

A time series is strictly stationary if all the moments of its probability distribution and not just the first two (mean and variance) are invariant overtime. Here focus is on weak stationarity.

The Kwiatkowski – Phillips – Schmidt – Shin (KPSS) test is used to test for time varying mean, while Brock, Dechert, Scheinkman and LeBaron (BDS) test is used to check for time varying variance. The KPSS test for mean stationarity is laid out in the table below. The KPSS test shows that the variables are stationary I (0) in mean, while the BDS and variance ratio test (VRT) test conducted later indicates that the variables are not stationary in variance. This implies that we can study the series behavior beyond the time period under consideration. Each set of time series will not be for a particular episode. As a consequence, it is possible to generalize it to other time periods.

Table 1: Unit root test with the KPSS statistic

Variable	Level of integration	Observed level of significance at 10%
Returnoninvestment	I (0)	0.333908
Commodity risk	I (0)	0.124545
Market risk	I (0)	0.108098
Liquidity risk	I (0)	0.255366
Political risk	I (0)	0.307143
Taxability risk	I (0)	0.263823
Economic risk	I (0)	0.762668
Mygarch	I (0)	0.46745

Source: Eview output

Empirical Regularities of Financial Asset Return and Volatility
Amplitude of Return
Volatility clustering means that there are periods when large changes are followed by further large changes and periods when small changes are followed by further small changes. Volatility clustering implies that the residuals are serially uncorrelated, but not independent. Being serially uncorrelated, but not independent implies that the residuals are strict white noise. The aim is to look at the heteroscedastic random walk. Serially uncorrelated simply means the series are random walk (white noise). White noise process hovers around zero. A white noise series is probably stationary. One popular approach to answering the question of serially uncorrelated is the Lo and MacKinlay overlapping variance ratio test. The variance ratio test examines the predictability of time series data by comparing variances of differences of the data (returns) calculated over different intervals. Alternately, Lo and MacKinlay outline a heteroskedastic random walk hypothesis where they weaken the independent and identically distributed (*i.i.d.*) assumption and allow for fairly general forms of conditional

heteroskedasticity and dependence. This hypothesis is sometimes termed the martingale null, since it offers a set of necessary (but not sufficient), conditions for $\in_t$ to be a martingale difference sequence (*m.d.s.*). The EGARCH – IN mean residuals is a random walk or follows the martingale difference as the Chow Denning Maximum |z| statistic observed significance of 0.5667 (see appendix A) accepts the null hypothesis. Thus conclude that the residual are serially uncorrelated and dependent.

The other side of volatility clustering is that apart from being serially uncorrelated, the residuals are not independent. A test to check for independence is the BDS (Brock, Dechert, Scheinkman and LeBaron) test. The BDS test is a portmanteau test for time based dependence in a series. The test can be applied to a series of estimated residuals to check whether the residuals are independent and identically distributed (*iid*). The dimensions of the BDS reject the hypothesis of i.i.d and conclude that observations of the residuals are not independent.

Volatility clustering can also be tested by conducting test for strict white noise. The Ljung-Box *Q*-statistics (see appendix B) for high-order serial correlation is often used as a test of whether the series is white noise. The *Q*-statistic at lag k is a test statistic for the null hypothesis that there is no autocorrelation up to order k (that is are white noise). The Q – statistics are insignificant correlations at all lags, thus the result indicates volatility clustering. This is because all the standardized residuals are white noise. Another test for volatility clustering is the test for ARCH effect performed in section 4.3.4.

Thick Tails
Thick Tails means that asset returns and risks tend to be leptokurtic. To model the thick tail in the residuals, we will assume that the errors follow a Student's *t*-distribution. The T-DIST. DOF of the EGARCH – IN MEAN output shows that the distribution of the standardized errors departs significantly from normality with a probability value of 0.0000. Given that the white noise (standardized errors) has different distribution (Jarque–Bera observed level of 0.000000 rejects the normality assumption) than normal, then white noise inherits a non – vanishing skewness (3.233367). The kurtosis shows that the white noise has thick tail (17).
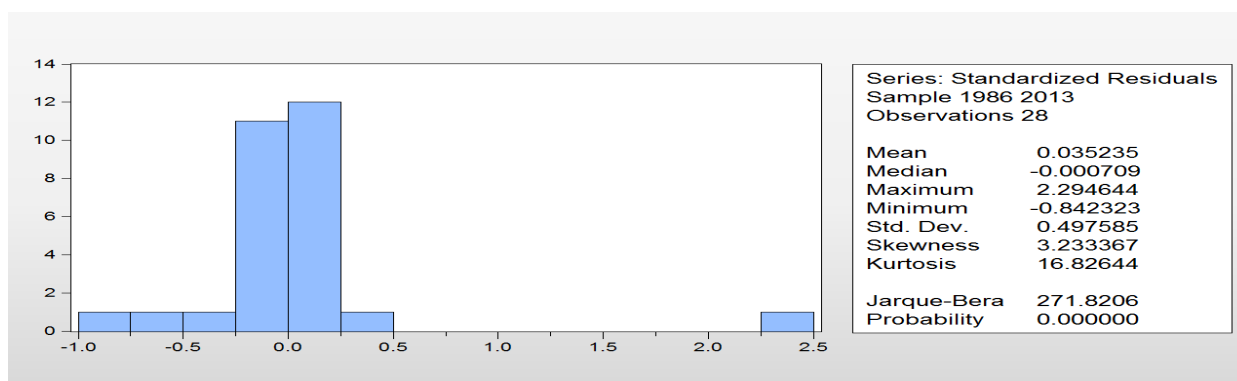
Figure A: Standardized residuals characteristics
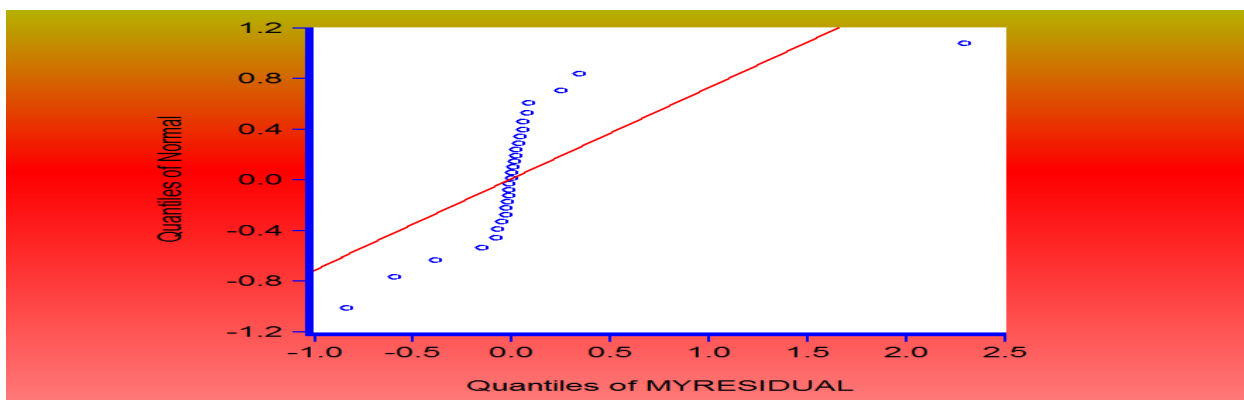
Figure B: Standardized residual Q - Q statistic

Similarly, the Jarque-Bera (JB) statistic observed level 0.139097 indicates that the returns are normally distributed, while the kurtosis value of 4 shows that asset returns are leptokurtic. The plot of Q-Q theoretical in figure B above indicates that it is primarily large negative shocks that are driving the departure from normality
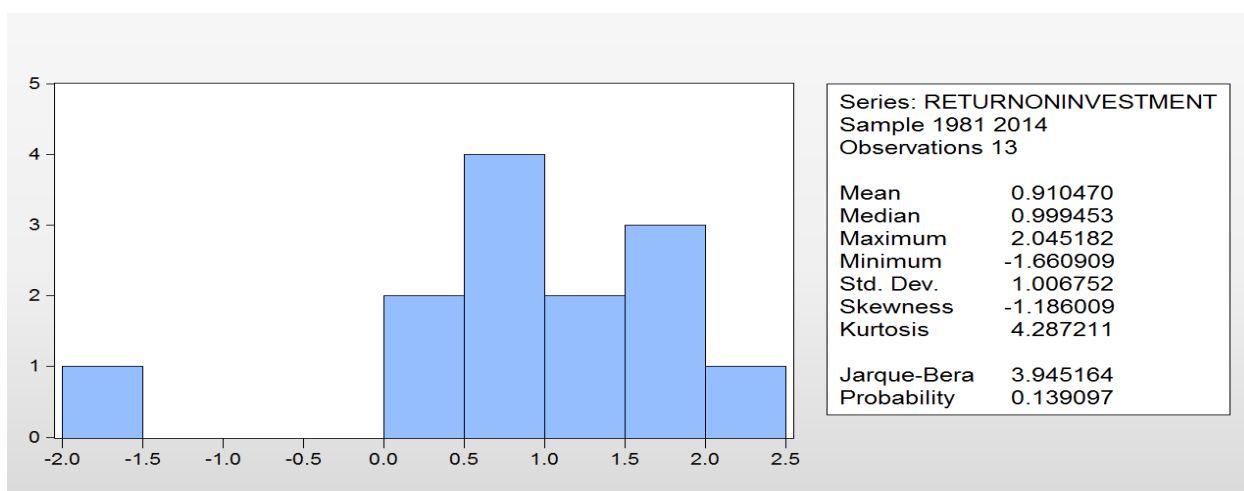
Figure C: Return on investment characteristics

Mean Reversion and Forecast able Events
Mean reversion apply the idea of buy low sell high. Mean reversion is measured with the variance ratio test (VRT). The variance ratio test measures trendiness or degree of mean reversion in a price or return of a series. VRT also tests the weak form efficiency of the efficient market hypothesis and hence the non-predictability of financial markets (see Ihejirika and Anyanwu 2013).

Variance ratio equal to one indicates that returns are pure random walk. Hence, no predictions are possible and hence trial to create a profitable trading system on such a return will fail. A variance ratio value greater than one indicates that returns show tendency to form trends. This means that changes in one direction are more often followed by similar changes in either direction (volatility clustering). Variance ratio less than one indicate that returns show some degree of mean reversion. This means that changes in one direction are followed by changes in the opposite direction.

The returns show volatility clustering using the variance ratio statistic and graph.
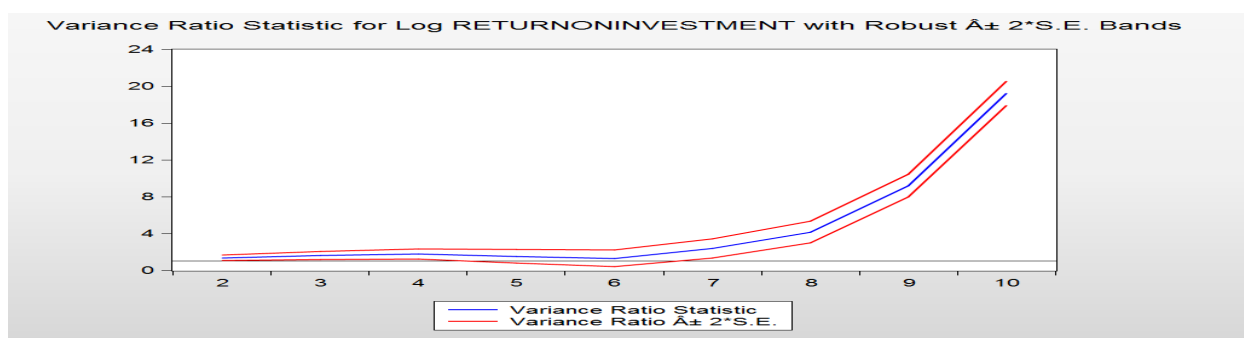
Figure D: Variance ratio graph
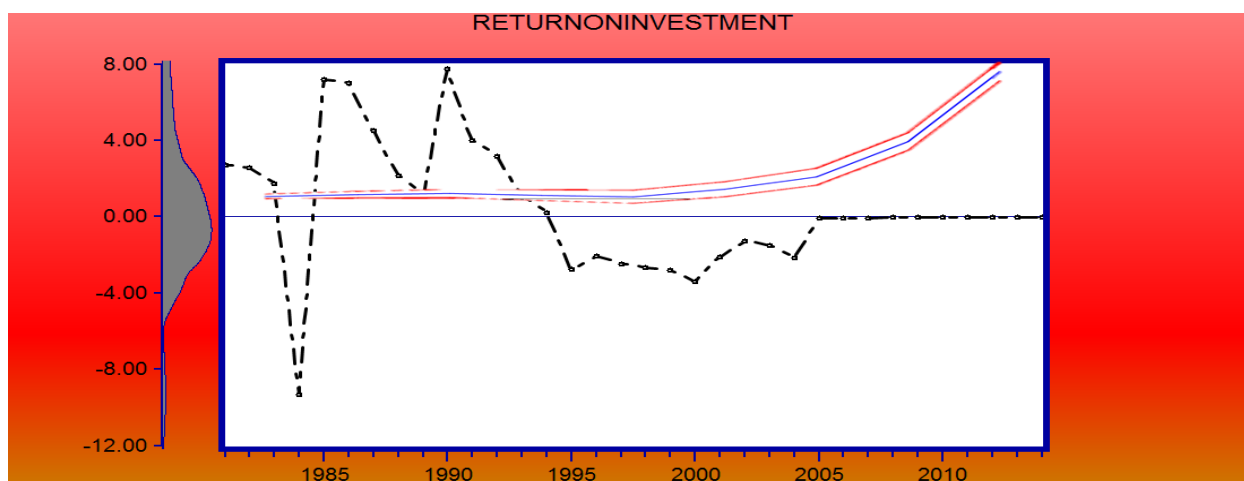
Figure E: graph of return on investment and variance ratio

Arch Effect (Time Varying Volatility)

The LaGrange multiplier test F statistic observed level of 0.7641 indicates no evidence of remaining ARCH (see appendix C)

DISCUSSION OF FINDINGS

The study revealed that Returns show Volatility clustering. This implies Investment Returns residuals are strict white noise. Foreign Private Portfolio Investment Return and Risk were found to have Thick tail. This implies that Foreign Private Portfolio Investment Return and Risk tend to be leptokurtic.

Mean reversion apply the idea of buy low sell high. The Variance Ratio Test (VRT) was used to test this as well as the weak form efficiency of the efficient market hypothesis and hence the non-predictability of financial markets. The results show volatility clustering using the variance ratio statistic and graph. This means that changes in one direction are more often followed by changes in the same direction.

CONCLUSION

This paper used the Principal Components of Nigeria's Foreign Private Portfolio Investment volatility to examine the Empirical Regularities of Nigeria's Foreign Private Portfolio Investment Return and Volatility. The study concludes that Nigeria's Foreign Private portfolio investment empirical imperatives is regular like that of the rest of the world. Based on the above findings the study recommends that investment decision models used by advanced analyst in developed countries can be applied to developing countries like Nigeria With little modification with respect to Foreign Private Portfolio Investment as their Assets and Risks display similar characteristics with Assets and Risks in Developed countries.

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APPENDIX

Appendix A: Variance ratio test

Null Hypothesis: MEANRESIDUAL is a martingale
Date: 10/19/16   Time: 04:17
Sample: 1981 2014
Included observations: 27 (after adjustments)
Heteroskedasticity robust standard error estimates
Use biased variance estimates
User-specified lags: 2 4 8 16

Joint Tests	Value	df	Probability
Max |z| (at period 4)*	1.314511	27	0.5667

Individual Tests				
Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	0.481958	0.398679	-1.299395	0.1938
4	0.212082	0.599400	-1.314511	0.1887
8	0.068730	0.740442	-1.257721	0.2085
16	0.026046	0.879408	-1.107511	0.2681

*Probability approximation using studentized maximum modulus with
    parameter value 4 and infinite degrees of freedom

Test Details (Mean = -0.0119518900946)

Period	Variance	Var. Ratio	Obs.	
1	0.50740	--	27	
2	0.24454	0.48196	26	
4	0.10761	0.21208	24	
8	0.03487	0.06873	20	
16	0.01322	0.02605	12	

Null Hypothesis: Log RETURNONINVESTMENT is a martingale
Date: 10/19/16   Time: 05:24
Sample: 1981 2014
Included observations: 11 (after adjustments)
Heteroskedasticity robust standard error estimates
Lags specified as grid: min=2, max=10, step=1

Joint Tests	Value	df	Probability
Max |z| (at period 10)*	27.63640	11	0.0000

Individual Tests				
Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.359774	0.158324	2.272389	0.0231
3	1.629494	0.225187	2.795422	0.0052
4	1.776950	0.282565	2.749628	0.0060
5	1.518257	0.367090	1.411797	0.1580

6	1.305822	0.453209	0.674792	0.4998
7	2.367640	0.522629	2.616848	0.0089
8	4.161073	0.577707	5.471761	0.0000
9	9.193746	0.622345	13.16591	0.0000
10	19.22092	0.659309	27.63640	0.0000

*Probability approximation using studentized maximum modulus with

   parameter value 9 and infinite degrees of freedom

Test Details (Mean = -0.371199369234)

Period	Variance	Var. Ratio	Obs.
1	0.81718	--	11
2	1.11118	1.35977	10
3	1.33159	1.62949	9
4	1.45208	1.77695	9
5	1.24069	1.51826	8
6	1.06709	1.30582	7
7	1.93478	2.36764	6
8	3.40034	4.16107	5
9	7.51292	9.19375	4
10	15.7069	19.2209	3

Appendix B: Ljung – Box Q statistic
Date: 10/19/16   Time: 03:46
Sample: 1981 2014
Included observations: 28
Q-statistic probabilities adjusted for 1 dynamic regressor

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. | . |	. | . |	1	-0.029	-0.029	0.0266	0.870
. | . |	. | . |	2	0.007	0.007	0.0284	0.986
. | . |	. | . |	3	0.002	0.002	0.0285	0.999
. |*. |	. |*. |	4	0.127	0.127	0.5929	0.964
.**| . |	.**| . |	5	-0.247	-0.244	2.8167	0.728
. | . |	. | . |	6	0.004	-0.005	2.8172	0.831
. | . |	. | . |	7	-0.020	-0.019	2.8331	0.900
. | . |	. | . |	8	0.027	0.015	2.8628	0.943
. | . |	. |*. |	9	0.025	0.093	2.8903	0.968
.**| . |	.**| . |	10	-0.243	-0.330	5.6348	0.845
. | . |	. | . |	11	-0.022	-0.012	5.6590	0.895
. | . |	. | . |	12	0.015	0.005	5.6706	0.932

Appendix C: Langrange multiplier test

Heteroskedasticity Test: ARCH

F-statistic	0.092063	Prob. F(1,25)	0.7641
Obs*R-squared	0.099063	Prob. Chi-Square(1)	0.7530

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 10/18/16   Time: 06:53
Sample (adjusted): 1987 2013
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.261676	0.204812	1.277642	0.2131
WGT_RESID^2(-1)	-0.060599	0.199722	-0.303418	0.7641

R-squared	0.003669	Mean dependent var	0.246607
Adjusted R-squared	-0.036184	S.D. dependent var	1.014282
S.E. of regression	1.032470	Akaike info criterion	2.972971
Sum squared resid	26.64983	Schwarz criterion	3.068959
Log likelihood	-38.13511	Hannan-Quinn criter.	3.001514
F-statistic	0.092063	Durbin-Watson stat	2.006718
Prob(F-statistic)	0.764082		

Appendix D: Correlogram squared residuals

Date: 10/19/16   Time: 15:20
Sample: 1981 2014
Included observations: 28

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. | . |	. | . |	1	-0.060	-0.060	0.1135	0.736
. | . |	.*| . |	2	-0.062	-0.066	0.2393	0.887
. | . |	.*| . |	3	-0.065	-0.074	0.3823	0.944
. | . |	.*| . |	4	-0.054	-0.068	0.4844	0.975
. |*. |	. |*. |	5	0.127	0.111	1.0766	0.956
. | . |	. | . |	6	-0.025	-0.023	1.1006	0.982
. | . |	. | . |	7	-0.026	-0.022	1.1277	0.992
. | . |	. | . |	8	-0.028	-0.022	1.1609	0.997
. | . |	. | . |	9	-0.025	-0.021	1.1882	0.999
. | . |	. | . |	10	0.048	0.022	1.2947	0.999
. | . |	. | . |	11	-0.027	-0.026	1.3296	1.000
. | . |	. | . |	12	-0.029	-0.029	1.3725	1.000

*Probabilities may not be valid for this equation specification.

APPENDIX E
Table1: Cell array of the principal component risks

YEAR	TAXABILITY RISK	LIQUIDITY RISK	ECONOMIC RISK	POLITICAL RISK	COMMODITY RISK	MARKET RISK
1981	NA	NA	NA	NA	NA	NA
1982	-1.287362	-0.54043	-1.72633	-3.09946	-1.59839	-0.36905
1983	-0.234714	0.059317	-1.56481	-2.01706	-0.58422	-0.44029
1984	0.160926	0.058752	-1.07884	-0.96249	-0.57641	-0.04561
1985	-0.708898	-0.5568	-0.38287	-0.44021	-0.38835	0.079286
1986	-1.100047	-0.18001	-0.01409	-0.36647	0.132203	0.025998
1987	0.341295	0.397972	-0.61174	-0.24051	0.281479	-0.97795
1988	1.405822	-0.74948	-0.60471	-1.17059	0.729271	-0.36155
1989	0.100069	-0.132	-0.73887	-0.23989	-0.06469	-0.21831
1990	1.003987	-1.31958	0.237017	-0.50013	0.601952	-0.40547
1991	0.377801	-2.35379	0.583389	0.806474	-0.39172	0.200879
1992	0.764743	0.09145	-0.71135	-0.75423	0.56374	-0.63932
1993	-0.18949	0.732523	-1.38445	1.2666	0.65538	0.86087
1994	-0.174356	0.895389	-2.81538	1.380854	0.965991	1.179281
1995	2.793582	4.108904	-0.89368	0.583524	0.345773	2.590952
1996	6.433625	-2.60076	1.818112	-0.81019	0.787195	0.897761
1997	0.221517	-1.63657	0.052576	1.075546	0.054107	-0.09598
1998	-1.049415	-1.94369	-0.69729	2.875814	0.01294	-0.11306
1999	-0.937469	-1.41855	-0.69889	2.469624	0.04057	-0.3753
2000	0.213552	-0.29041	-0.54171	0.062356	-0.00417	-0.16026
2001	1.181952	1.583117	2.554715	1.382464	-3.4824	-0.53993
2002	0.315594	1.336058	0.631184	0.376442	-1.81282	-1.36655
2003	-0.716947	-0.29152	-0.20025	0.071518	-0.15477	-0.04027
2004	-0.528171	-0.78359	-0.01582	0.196094	-0.21974	0.19726
2005	1.238905	1.527031	0.146404	0.005847	-0.40879	0.159978
2006	-0.079888	-0.12871	-0.73328	-0.10915	0.059789	-0.11393
2007	-0.977566	0.000315	0.206931	-0.07683	-0.33092	0.53849
2008	-1.499516	0.135709	0.960551	-0.2368	0.723454	0.216345
2009	-2.399554	0.614129	2.75926	-0.73387	2.570088	0.524738
2010	1.111552	2.255397	0.377498	0.261564	1.547876	-3.00517
2011	-1.06097	1.151042	1.578838	0.210968	1.695399	-1.793
2012	-0.901421	-0.12918	-0.08116	-0.00957	-0.7274	0.106293
2013	-2.319558	-0.01727	1.833828	-1.07234	0.17253	2.510201

Source: Authors computations (factor scores from principal component analysis, Ndugbu et al (2017)

Prevalence of Hepatitis B and Its Associated Factors Among Pregnant Women in Mogadishu, Somalia

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ABSTRACT

Background: Hepatitis B is a major global health problem caused by viral infection that attacks the liver and can cause both acute and chronic disease. There are about 65 million individuals who carry HBV in Africa, with a 25% mortality risk. In sub-Saharan Africa, the prevalence of HBV infection ranges from 9-20%. Pregnant mothers who test positive for both hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg) have 70–90% risk of transmitting infection to their newborn infants and about 10–40% risk if they test positive for only HBsAg. Therefore, pregnant women should be routinely screened for HBsAg and hepatitis B vaccine administered at birth to the infants whose mothers test positive. Objective: To identify prevalence of Hepatitis B (HBsAg) and its associated factors among pregnant women in Mogadishu, Somalia. Methodology: This was a hospital based cross-sectional study. This design was used to identify potential risk factors associated with development of Hepatitis B virus. Cross-sectional was used to assess the frequency and distribution of Hepatitis B among pregnant women and to investigate factors associated with it. The study instruments were structured questionnaires which were both categorical and open ended. Data was entered and analyzed with SPSS version 16.0. Both Univariate and Bivariate analysis were carried out to see frequencies and significant associations, a P-value less than 0.05 was considered as significant association. Result: The mean age of the respondents was 24.65 (±6.05) years. It was found that women in the age category of (≥30) were more likely to get Hepatitis B compared to those below categories (OR 1.69, 95%CI 1.11-1.89). The study revealed that 96.4% of the respondents were unemployed whose majority (79.1%) were from families of low economic status and these were 2.1 times more likely to contract Hepatitis B compared to the pregnant women who are in the category of middle and high economic status (OR 2.1 95% CI 1.25-3.21). The study reported that mothers with gravidity of 7 and more were 2.1 times (OR 2.1, 95%CI 1.31-3.04) more likely to get hepatitis B compared to mothers with gravidity between1-6. Moreover, prevalence of hospital delivery was around one-third (36.5%) while almost another one-third was attended by TBAs. Finally, the study has found that the seroprevalence of HBsAg among pregnant women was 4.12%. Conclusion and Recommendation: The study found out that HBsAg prevalence among pregnant women in Mogadishu was 4.12%, significantly associated with age, economic status, gravidity, birth attendant and abortion. It is recommended that MoH and health professionals adopt universal screening of all pregnant women for HBsAg during each pregnancy, prophylaxis and routine vaccination of both mothers and infants and also management of Hepatitis B cases.

Key words: Hepatitis, prevalence of HBsAg, pregnant women, antenatal care

BACKGROUND INFORMATION

Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. The virus is transmitted through contact with the blood or other body fluids of an

infected person. An estimated 257-350 million people are living with hepatitis B virus infection (defined as hepatitis B surface antigen positive). In 2015, hepatitis B resulted in 887 000 deaths, mostly from complications (including cirrhosis and hepatocellular carcinoma).

There are about 65 million individuals who carry HBV in Africa, with a 25% mortality risk. In sub-Saharan Africa, the prevalence of HBV infection ranges from 9-20% (Kiire, 1996 & Kramvis, 2007). This high prevalence is derived from epidemiological data which remain insufficient in this part of Africa.

Strickland and El-Kamary (2013) argued that although the virus is present worldwide, some populations in sub-Saharan Africa, Southeast Asia, Eastern Europe, and the Middle East, as well as in indigenous communities are Hepatitis B carriers. Travelers getting tattoos or piercings abroad, using drugs intravenously, sharing needles and razor blades, undergoing dental, medical or delivery procedures, infants of Hepatitis B virus positive or having unprotected sex are at risk.

In regions of the world where hepatitis B is highly endemic, HBV accounts for around 3% of the total mortality, ranking with other vaccine preventable childhood diseases such as measles, tetanus, pertussis, and polio. Of the world's approximately seven billion people, 3.8% live in areas of moderate to high hepatitis B endemicity (carrier rate >2%). Therefore World Health Organization (WHO) considers hepatitis B virus (HBV) to be second to tobacco among the carcinogens (Maynard, 1990 and WHO, 2017).

Pregnant mothers who test positive for both hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg) have 70–90% risk of transmitting infection to their newborn infants and about 10–40% risk if they test positive for only HBsAg. (Beasley, 1982 and Alter, 2003). Therefore, pregnant women should be routinely screened for HBsAg and hepatitis B vaccine administered at birth to the infants whose mothers test positive.

As reported by (WHO, 2017) consequences of HBV infection in pregnancy, besides vertical transmission, include an increased likelihood of occurrence of pre-term delivery and low birth weight. Furthermore, HBV infection has been reported to be associated with threatened preterm labour, antepartum hemorrhage as well as gestational diabetes mellitus (Strickland, 2013).

Chronic HBV infection in pregnant women is usually asymptomatic but can be associated with mild liver disease. The outcome depends on the severity of disease and presence of portal hypertension, whose presence indicates poor long term prognosis. In that case, abortion and sterilization should be opted for (Strickland, 2013).

It is argued that Hepatocellular carcinoma is rare in pregnancy due to the late age of presentation in females, the known male predominance, and the decrease in fertility in women with cirrhosis. Oral contraceptives and high parity are known to be at an increased risk. Furthermore, pregnancy is known to worsen the prognosis of patients with hepatocellular carcinoma (Lavanchy, 2004).

Reported consequences of HBV infection in pregnancy include an increased likelihood of occurrence of pre-term delivery and low birth weight (Cunninghan and Leveno, 2005). Furthermore, HBV infection has been reported to be associated with threatened preterm

labour, antepartum haemorrhage as well as gestational diabetes mellitus (Tse, Ho, and Lao, 2005).

As reported by WHO the prevalence of HBV infection among pregnant women in African countries ranges from 6% to 25% (WHO meta-analysis done 2007). However, a study done in Nigeria showed that the prevalence to be 4.3% (Akani, Ojule, Opurum, and Ejilemele, 2005), while in Sudan the prevalence found was 5.6% (Elsheikh et al, 2007) and that one of Kenya was 9.3%, still another study done in Tanzania showed a prevalence of HBsAg among pregnant women was reported to vary between 3.5% and 6.3%.

Imagine that this serious public health problem is totally preventable with currently available safe and effective vaccines. WHO recommends that all infants should receive their first dose of vaccine as soon as possible after birth, preferably within 24 hours. Delivery of hepatitis B vaccine within 24 hours of birth should be a performance indicator for all immunization programmes. The birth dose should be followed by 2 or 3 doses to complete the primary series (WHO, 2017).

WHO also strongly recommends that all regions and associated countries develop goals for hepatitis B control appropriate to their epidemiological situation (WHO, 2017). In May 2016, the World Health Assembly endorsed the Global Health Sector Strategy (GHSS) on viral hepatitis 2016–2021. The GHSS calls for the elimination of viral hepatitis as a public health threat by 2030 (reducing new infections by 90% and mortality by 65%) (WHO, 2017).

The information is important in relation to the adoption of recommendations made by WHO on screening of pregnant women and offering the at-birth-dose of HBV vaccine to prevent perinatal transmission for those mothers who test positive.

Little is known about the prevalence of Hepatitis B among pregnant women in Somalia for the last three decades. This lack of information led the community to remain unaware of the common modes of infection transmission, its preventive and control measures.

PROBLEM STATEMENT

The virus that causes Hepatitis B attacks the liver and can cause both acute and chronic disease. It is a major global health problem, and the most serious type of viral hepatitis. Hepatitis B mortality is estimated about 780,000 people die each year due to consequences of hepatitis B, such as liver cirrhosis and liver cancer. The virus is highly contagious and is transmitted through contact with the blood or other body fluids of an infected person through various modes of transmissions. Although it is preventable with currently available safe and effective vaccines, it is still a serious public health problem in Sub-Saharan Africa and especially Somalia where all healthcare infrastructures had collapsed due to lack of effective central government for the last three decades.

According to WHO classification, the prevalence of chronic HBV infection varies geographically, from high (>8%), intermediate (2-7%) to low (<2%) prevalence. Although EMRO was once a region of high-to-intermediate Hepatitis B epidemicity, it is now low-to-intermediate endemicity, however Somalia which is in WHO EMRO region remains in the category of high HBsAg prevalence of more than 8% (WHO, 2017). The prevalence of the infection in Somalia is significantly higher than almost all the countries in EMRO region. Though little is known about the prevalence of Hepatitis B surface antigen among pregnant women, it is hypothesized that the incidence and prevalence of HBsAg among Somali women are also high. This is mainly due to lack of community awareness on predominant modes of Hepatitis B transmission in general

and risks of infection transmission related to socio-demographic factors of Somali women, behavioral factors, occupational factors as well as pregnancy and childbirth aspects. Vertical transmission from the mother to the child is one of the major modes of transmission that is not given its priority.

Despite recommendations proposed by WHO since 2002 of screening all pregnant women against HBV and universal immunization of all infants against HBV infection, routine screening of HBV among pregnant women is not practiced in most health centers and hospitals in the country and we don't have recent data on the magnitude of the problem.

Furthermore, the WHO Global Health Sector Strategy (GHSS) calls for the elimination of viral hepatitis as a public health threat by 2030 was not yet adopted as intervention strategy in the country. Therefore, if these situations are left unidentified and not getting involved (not intervened) and let it continue, consequently it will lead to an escalating rate of Hepatitis B morbidity and mortality in the country.

This study was aimed at assessing the prevalence of Hepatitis B virus and its associated factors among pregnant women in Mogadishu, Somalia.

OBJECTIVES

Main Objective

To identify prevalence of Hepatitis B (HBsAg) and its associated factors among pregnant women in Mogadishu, Somalia.

Specific Objectives

1. To identify prevalence of Hepatitis B (HBsAg) among pregnant women in Mogadishu women attending at antenatal department of SOS Hospital.
2. To establish factors related to HBV transmission among pregnant women attending at antenatal department of SOS Hospital.

LITERATURE REVIEW

Hepatitis is a medical condition defined by the inflammation of the liver and characterized by the presence of inflammatory cells in the tissue of the organ. The causes of hepatitis are varied with hepatitis viruses being very common. The hepatitis viruses are A, B, C, D, E, F, and G. Hepatitis A and E are transmitted by the feco-oral route. Hepatitis B and C can cause more chronic infection and transmitted either horizontally or vertically (who, 2013).

Unlike tuberculosis, HIV/AIDS and malaria that have attracted both national and international attention, Hepatitis B infection has been relegated to the background such that information about the infection is even difficult to obtain. For developing countries the major reason for this would be inadequate funds for voluntary mass testing, vaccination and treatment. With most of infected carriers are not aware of their status (GHS 2009), raising awareness is crucial to stemming the tide of new infections and reducing the stigma associated with the infection (Higginsetall, 1996).

The widespread use of hepatitis B vaccine in infants has considerably reduced the incidence of new chronic HBV infections. Between the prevaccine era (which, according to the year of introduction can range from the 1980s to the early 2000s) and 2015, the proportion of children under 5 years of age who became chronically infected fell from 4.7% to 1.3%. The

remaining infections mostly occur from the mother at birth or through contact with other infected young children (WHO, 2017).

WHO estimates that in 2015, 257 million persons, or 3.5% of the population, were living with chronic HBV infection in the world. The African and Western Pacific regions accounted for 68% of those infected. 2.7 million persons were co-infected with HBV and HIV. Most of the people currently living with HBV infection are persons born before hepatitis B vaccine was widely available and used in infancy (WHO, 2017).

Status of Hepatitis B
Most of the burden of disease from HBV infection comes from infections acquired before the age of 5 years (Beasley et al, 1977). Therefore, prevention of HBV infection focuses on children under 5 years of age. The United Nations selected the cumulative incidence of chronic HBV infection at 5 years of age as an indicator of the Sustainable Development Goal target for "combating hepatitis" (World health statistics 2016). This indicator is measured indirectly through the proportion of children 5 years of age who have developed chronic HBV infection (i.e. the proportion that tests positive for a marker of infection called hepatitis B surface antigen HBsAg).

Infants born to untreated HBV-infected mothers can acquire infection from the mother, mostly during birth. Infants born to mothers who are positive for both HBsAg and hepatitis B e antigen (HBeAg) are at a higher risk of acquiring infection (transmission risk for HBsAg positive and HBeAg-positive mothers: 70–100% in Asia and 40% in Africa) than those born to HBsAg-positive mothers who have lost the HBeAg (5–30% in Asia and 5% in Africa) (Beasley et al, 1977, Okada, 1976 and Keane, Funk and Shimakawa, 2016). Early vaccination of the baby against hepatitis B with a first dose within 24 hours of birth (timely birth dose) contributes to the prevention of mother-to-child transmission. The efficacy of the vaccine decreases with the concentration of HBV in the blood of the mother. HBeAg-negative mothers have a near 0% risk of transmitting HBV to their offspring vaccinated at birth (Machaira et al, 2015), while HBeAg-positive mothers have a 20% risk of transmitting the virus despite vaccination at birth (Lee, etal, 2006). Treatment of pregnant mothers with antivirals, which is being introduced as a new intervention to prevent mother-to-child transmission of HBV, should further reduce the risks of transmission (Brown et al.2016).

The low incidence of chronic HBV infection in children under 5 years of age at present can be attributed to the widespread use of hepatitis B vaccine. Worldwide, in 2015, the estimated prevalence of HBV infection in this age group was about 1.3%, compared with about 4.7% in the pre-vaccination era. However, the prevalence was still 3% in the African Region. This fall in the incidence of chronic HBV infections among children means that in the long term, the global hepatitis B epidemic will decline. However, deaths among infected adults born before the era of vaccination will continue to increase if they are not diagnosed and treated.

Global Prevalence of HBV infection
In 2015, the global prevalence of HBV infection in the general population was 3.5%. Among those born before the hepatitis B vaccine became available, the proportion of persons living with chronic HBV infection remains high. In terms of WHO regions, prevalence was the highest in the African (6.1%) and Western Pacific regions (6.2%). Overall, about 257 million persons were living with HBV infection. Assuming that women of reproductive age constitute 25.3% of the world's population (United Nations data), adults chronically infected may include 65 million women of childbearing age who can potentially transmit HBV to their babies. In addition, a proportion of these adults would benefit from long-term, if not lifelong, treatment,

particularly those above 30 years of age, those who have cirrhosis, and those with HIV infection (WHO, 2015). This proportion of patients who would benefit from treatment is not well known. In community-based studies, reports range from less than 5% (Lemoine et al 2016) to about 10% (Shankar et al. 2016). In health-care facility-based studies, the proportion is higher (Spradling, et al. 2016).

Prevalence of Hepatitis B virus among Pregnant Women
The reported prevalence of HBV infection among pregnant women in African countries ranges from 6% to 25% (WHO, 2007). However, a study done in Nigeria showed the prevalence to be 4.3% (Akani, Ojule, Opurum and Ejilemele, 2005), while in Sudan the prevalence was 5.6% (Elsheikh et al, 2007). The reported prevalence of HBsAg in Kenya was 9.3%, while that of HBeAg was 18.8% in a study done in 2001 to 2002. It was concluded in that study that there was a high carrier rate, and it also questioned on the results from the previous studies which reported low prevalence (Okoth et al. 2006). Tanzania was also reported to be one of the countries with high endemicity levels of HBV infection according to the World Health organization WHO. This is defined as a prevalence rate equal to or greater than 8% (WHO, 2002). In 1987, the HBsAg carrier rates in Tanzania were estimated to be 10% and 15% among the general population and pregnant women respectively (Haukenes, Mbena, Rustad, 1987).

Apart from prevalence of 3.5% (Kibassa and Msengi, 2004) and 6.3% (Menendez et al. 1999) reported among pregnant women in studies done in mid-1990's, a figure as high as 56.7% was reported by Shao et al in a study done in 1989 (Shao, Haukenes, Yangi, and Vollset 1993). In the same study, the seroprevalence of HBsAg in HIV infected pregnant mothers was found to be 66.7% (Shao, Haukenes, Yangi, and Vollset 1993). Matee et al found the prevalence of HBsAg to be 11.0% among blood donors (Matee and Lyamuya, 2008) while Nagu found 17.3.% among HIV patients at MNH (Machaira et al, 2015).

Pregnant women are not spared from HBV infection in which case the great concern is that their babies may also be affected. Indeed it is reported that 70%-90% of chronic HBV infections occur following the acute infections taking place during childhood (Kasper, Braunwald, Fauci, 2006).

Furthermore, in a previous study done in India, 2.25% of children under five were found to be positive for HBsAg despite immunization, and no statistically significant difference was observed between the age groups, suggesting that most of the infections occurred via vertical transmission (Chakravarti, Rawat, and Jain, 2005).

Kasper, Braunwald, and Fauci (2006) argued that the main modes of transmission of HBV are via blood, during sexual intercourse and perinatally. Vertical transmission from mother to infant in the perinatal period is a major mode of transmission in regions where hepatitis B is endemic through ingestion of maternal fluids (amniotic fluid, vaginal secretions, and blood (Kasper, Braunwald and Fauci, 2006). Transplacental transmission is reported to be low, even to those infected mothers on whom amniocentesis has been done to (Towers, Asrat and Rumney 2001 & Alexander et al, 1999).

Factors Associated with Acquisition of Hepatitis B Virus (HBV)
Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. The virus is transmitted through contact with the blood or other body fluids of an infected person. Other factors reported to be associated with acquisition of HBV include increasing age, male gender, low level of education and history of previous surgery, multiple

sexual partners, HIV infection, and non-use of condoms (Bwogi et al. 2009 & Ferreira et al. 2009). Moreover, it was found that heterosexual sex is the main mode of transmission accounting for 85.0% of all reported cases in 2008. Mother to child transmission was less than 6.0% and blood transfusion was less than 1.0% (NACP, 2009).

Among pregnant women with high parity, polygamy, multiple sexual partners and previous history of sexually transmitted disease were shown to be among the significant risk factors for HBV infection in Nigeria (Obi, Onah, and Ezugwu, 2006). In contrary to the above stated facts, a study done by Kibassa and Msengi in 2004 showed no association with marital status, previous history of jaundice, history of blood transfusion and age.

Since HIV and HBV share the modes of HIV transmission, it is plausible that HBV and HIV co-infection can occur, and this has been documented. Co-infection in Tanzania among HIV infected patients was found to be 17.3% among patients attending the Care and Treatment centre at the **MNH** (Machaira et al, 2015). Co-infection with HIV in pregnant women could occur since the modes of transmission are shared. A study done among pregnant women showed that one out of sixteen HIV infected had HBV infection as well.

HIV/AIDS is a major global health problem. By the end of 2009, it was estimated that 33.3 million people worldwide were living with HIV and AIDS. Sub-Saharan Africa is the world most severely affected region (UNAIDS, 2010).

In Somalia as reported by UNAIDS (2016), adults and children living with HIV was estimated 24000 of whom 11000 are females over 15 years old with overall prevalence in the general population of 0.4%.

Of the estimated 350 million individuals chronically infected with hepatitis B virus (HBV) worldwide, it is generally accepted that at least 50% acquired their infections either perinatally or in early childhood, especially in countries where HBV is endemic (Alter, 2003). This is attributed to the high rates of HBeAg-positive infections in women of child-bearing age in these parts of the world, and the efficient transmission of infection from these women to their newborns. It has long been recognized that prevention of perinatal transmission is a high priority in the attempt to decrease the global burden of chronic HBV (Alter, 2003).

Immuno-prophylaxis with hepatitis B immune globulin (HBIG) and hepatitis B vaccine is known to be safe and effective, but applied variably in different geographical regions. Even with proper vaccination, 5–10% of infants of HBeAg-positive women become infected, and so there is opportunity for improvement in prevention strategies. In addition, the interaction of HBV infection and pregnancy itself is an area for further study. The prevalence of chronic HBV infection in pregnant women in urban areas of the USA varies by race and ethnicity (Euler, Wooten, Baughman, and Williams, 2003). As expected, the highest rate (6%) is in Asian women. The rates in black, white and Hispanic women are 1, 0.6 and 0.14% respectively.

Effect of hepatitis B on pregnancy
Susceptible women who develop acute hepatitis B during pregnancy may have an illness indistinguishable from that in the general population. Acute HBV infection must be differentiated from other acute liver diseases that occur during pregnancy such as intrahepatic cholestasis or acute fatty liver of pregnancy if jaundice is present, or haemolysis, elevated liver enzymes and low platelets syndrome if jaundice is absent. It does not appear that acute HBV infection increases mortality during pregnancy, or that it has teratogenic effects. However, a higher incidence of low birth weight and prematurity has been reported. In addition, acute

HBV early in pregnancy is associated with a 10% perinatal transmission rate, and the rate increases substantially with HBV infection in the third trimester.

The effects of chronic HBV infection on pregnancy outcomes have not been clearly defined. One large study demonstrated no differences in gestational age at delivery, birth weight, incidence of prematurity, neonatal jaundice, congenital anomalies or perinatal mortality comparing HBsAg-positive women with controls (Wong, et al. 1999). However, a relatively recent study described an association of maternal HBV infection (HBsAg positive) with gestational diabetes mellitus and antepartum haemorrhage (Tse, Lo and Lao, 2005). There was a suggested association with preterm delivery.

Consideration of active HBV infection during pregnancy raises the question of whether amniocentesis is contraindicated in this setting. In one series of 21 mother–infant pairs, in which the mothers were HBsAg positive (but only one HBeAg positive) and underwent amniocentesis for accepted indications at a mean of 19.5 weeks gestation, none of the infants were HBsAg positive at 1 or 12 months of age (Alexander et al, 1999); they had received the HBIG and HBV vaccine as recommended.

Effect of pregnancy on hepatitis B
In general, women with chronic hepatitis B do well during pregnancy. However, pregnancy is associated with high levels of adrenal corticosteroids, which might be expected to increase levels of viraemia, and oestrogen, which has been demonstrated in laboratory animals to decrease HBV replication. In one study, no significant differences in HBV viraemia were noted during pregnancy, although alanine aminotransferase (ALT) levels tended to increase late in pregnancy and in the post-partum period (Soderstr¨om, Norkrans and Lindh, 2003). It has been known for some time that a proportion of women have hepatitis flares with or without HBeAg seroconversion within the first months after delivery (Lin et al. 1989). Seroconversion rates of 12.5% (Lin, Wu, and Kao, 2006) to 17% (Lin et al. 1989) have been described.

It has been postulated that the rapid decrease in cortisol levels characteristic of the post-partum state is analogous to the steroid withdrawal therapy that has been used to elicit seroconversion (Lin et al. 2006, & Ter-Borg, 2008). Although usually this is well tolerated, cases of exacerbation of hepatitis (Ter-Borg, 2008) and even fulminant hepatic failure (Yang, 2004) have been described in the peripartum period. Exacerbation of hepatitis was not prevented by administration of lamivudine in the third trimester (TerBorg, 2008). Factors that do not appear to be associated with likelihood of postpartum HBeAg clearance include maternal age, parity and presence of precore or basal core promoter mutations (Lin HH, et al. 2006). In one report, a low maternal HBeAg level was strongly associated with postpartum HBeAg clearance (Lin et al. 2006). It appears prudent to monitor HBV infected women closely for several months after delivery for hepatitis flares and seroconversion.

Perinatal hepatitis B virus transmission
Perinatal transmission of HBV results in a high frequency of chronic infection, up to 90% in infants born to HBeAg-positive women. It is widely accepted that most perinatal transmission occurs at or near the time of birth, because neonatal vaccination prevents newborn infection in about 80–95% of cases. Theoretical risks for HBV transmission at delivery include exposure to cervical secretions and maternal blood. Transplacental (intra-uterine) transmission is presumed to cause the minority of infections not prevented by prompt immunization. Risk factors for transplacental transmission of HBV include maternal HBeAg positivity, HBsAg titre and HBV DNA level (Xu, et al. 2002).

Threatened preterm labour or spontaneous abortion, with the possible mixing of maternal and fetal blood, appears to increase the risk of HBV transmission (Lin, Lee, Chen, et al. 1987). Recently, polymorphisms in some cytokine genes, such as those encoding for interferon-g and tumour necrosis factora, have been correlated with risk of intra-uterine infection with HBV (Zhu et al. 2005 & Yu, et al. 2006). Prevention of perinatal transmission is considered critical in the attempt to decrease individual and population morbidity from chronic hepatitis B infection as well as the global burden of hepatitis B.

Hepatitis B virus and human immunodeficiency virus co-infection during pregnancy
There are few reports of HBV co-infection with the human immunodeficiency virus (HIV) in pregnant women. In sub-Saharan Africa, where HBV is endemic, 13% of HIV-infected pregnant women also have HBV. In the only American series, 1.5% of 455 HIV infected obstetrical patients followed in Texas over 11 years were HBV co-infected (Santiago et al, 2005).

Hepatocellular carcinoma and pregnancy
There are rare recorded cases of hepatocellular carcinoma (HCC) in pregnancy. In several reports, fetal outcome was often satisfactory although some intrauterine deaths were recorded. Maternal mortality was high, suggesting an adverse effect of pregnancy on the outcome of this malignancy. Twenty of the 33 reported women in a combined series died within a few days of the initial presentation (Cobey and Salem, 2004, & dela-Rosa et al. 2006) and most others succumbed within months. It has been suggested that oestrogen may accelerate the evolution of HCC as it does for other liver tumours. In addition, gestational immune suppression may be an enabling factor in tumour progression (Lau, Leung, and Ho, 1995).

Vaccination against hepatitis B virus during pregnancy
Vaccination against HBV is both safe and efficacious during pregnancy (Gupta and Ratho 2003 & Levy and Koren, 1991). In addition, passive transfer of maternal antibody to newborns has been demonstrated, although without the addition of active vaccination, titres in the infants were noted to wane over time (Gupta and Ratho, 2003), as would be expected.

Immunoprophylaxis provided to newborns clearly reduces the incidence of perinatal HBV transmission. In a recent meta-analysis of clinical trials (Lee, Gong, Brok, Boxall, and Gluud, 2006), the relative risk of neonatal HBV infection in those who received HBV vaccine (plasma-derived or recombinant) was 0.28 [95% confidence interval (CI) 0.2–0.4] compared with those who received placebo or no intervention. Compared with vaccine alone, the addition of HBIG to the regimen further reduced the relative risk (0.54, 95% CI 0.41–0.73) when compared with active prophylaxis only. Nonetheless, there are clearly a substantial number of newborn infections, even with prompt administration of active and passive vaccination. The estimates vary, and depend on maternal HBeAg status, but most studies demonstrate anywhere from 1% (DelCanho, Grosheide, Mazel, et al. 1997) to 10% (Lee, Gong, Brok, Boxall and Gluud, 2006) chronic HBV infection in infants who were appropriately immunized. Clearly, with millions of at-risk pregnancies each year throughout the world, significant numbers of perinatally acquired chronic HBV infection are still occurring.

METHODOLOGY
Study setting
The study was conducted at SOS Mother & Child Hospital. SOS Mother and Child hospital is referral public hospital located in Mogadishu that receives its patients and clients from the various districts of Benadir Region as well as other regions of the country. It has both Pediatric and Maternity departments that offer free high quality CEmONC and childcare services.

Study design
This was a hospital based cross-sectional study. This design was used to identify potential risk factors associated with development of Hepatitis B virus. Cross-sectional was used to assess the frequency and distribution of Hepatitis B among pregnant women and to investigate factors associated with it.

Study period
The study was conducted between 1st August and 31st October 2017.

Study population
The study population was all pregnant women attending SOS Hospital for ANC services who hailed from different parts of Benadir Region.

Study instrument
The study instruments were structured questionnaires which were both categorical and open ended. Questionnaires were administered to the study participants who consented and fulfilled study eligibility criteria. Then blood sample was taken to determine the participant's HBsAg status.

Sample size determination
Sample size was calculated using Kish Leslie (1965) formula for cross sectional studies. Based on the 9.4% prevalence of HBsAg infection among pregnant women in Kenya, one of our neighboring countries which shares similar features with Somalia (Okoth et al. 2006). A sample size of 364 was studied using the Epi info Stat calculator based on prevalence of 9.4% with 3% error at 95% confidence interval.

The formula is:

$$n = \left[\frac{Z^2 PQ}{\delta^2} \right]$$

n - Sample Size
Z - Parameter related to error risk, equal to 1.96 or 2 for error of 5%
P = Expected prevalence of malnutrition of the population, expressed as a fraction of 1
d - Degree of accuracy, expressed as fraction of 1
q = 1-P, expressed proportion of children not malnourished, expressed as a fraction of 1

If
P = 9.4%
q = 90.6
Z = 1.96

By substitution

$$n = \left[\frac{Z^2 PQ}{\delta^2} \right]$$

$=1.96^2 \times 0.094 \times 0.906/0.03^2 = 364$

Sampling techniques
All pregnant women attending at the ANC Department of SOS Hospital were consecutively enrolled until the desired sample size was reached.

Inclusion and exclusion criteria
Inclusion Criteria
All pregnant women attending SOS antenatal clinic for ANC services during the study period (August-October, 2017) who were willing to participate in the study

Exclusion criteria
All pregnant women attending at SOS antenatal clinic for the first time at SOS Hospital during the study period (August to October, 2017) who were too sick or those who were not willing to participate in the study.

Study variables
The study variables included socio-demographic factors, obstetric factors and risk factors which were believed to predispose women to Hepatitis B. **The socio-demographic factors** were: age at interview, respondent's residence, respondent's education, occupation of the respondent and economic status. **Other obstetric factors** included number of previous pregnancies (gravida), number of previous deliveries (para), mode of delivery, delivery attendant, delivery site and abortion. **The risk characteristics** were ear/nose piercing, injection, history of blood transfusion and surgical procedures.

Data collection
Pregnant women who consented to participate were subjected to a face-to-face interview with the investigator/assistant whereby pre-test counseling was done, and then the questionnaire was filled in to obtain information on socio-demographic, obstetrics and risk characteristics. At end of the interview a venipuncture was performed and blood collected in a vacutainer tube. Five (5 mls) milliliters of blood were collected for Hepatitis B serology.

Data were collected by third year nursing students who interviewed the participants and took the blood sample for investigation of HBsAg. All samples were screened, using a (Laborex HBsAg Rapid Test). All samples found to be positive for HBsAg were further tested for double checking and if again positive then were considered to be positive.

A mark was put in the clinic card of all enrolled mothers to avoid repeat inclusions during their subsequent visits.

Data management/analysis
Data were entered and analyzed with Statistical Package for Social Sciences (SPSS) version 16.0. The Mean, Standard deviation and test of comparison where categorical variables were summarized as proportions and some were further analyzed using Chi square and Fisher´s Exact Test to assess association between the variables. Test of association using Logistic Regression was done to describe the relationship between the predictor variables (risk factors for HBV infection found to be statistically significant) and the outcome variable (HBsAg). The P value < 0.05 was considered significant.

Quality assurance procedures
Training of research assistants
Senior nursing students who fluently speak both English and Somali languages were selected as research assistants and then trained for two days about the study objectives, interviewing

techniques, venipuncture, sample testing, data collection tools, ethical issues, responsibilities of data collectors and quality control.

Pre-testing
Data collection technique and tools were tested before the actual data collection at SOS MCH for piloting. Corrections were made where necessary to validate the tools.

Missing data
The returned and completed tools have been cross-checked by the researcher to ascertain their completeness. Questionnaires with missing data were re-administered to the respondents for correction.

Data Handling
Two research assistants were identified and trained to standardize data collection procedures. Soft copies of data were coded and hard copies locked in a locker in the office of the principal researchers. Research team had access to data only when permission was granted by the principal researchers.

Ethical considerations
Ethical clearance for this research was obtained from the SOS Hospital Administration, District Research Committee and individuals who were to be interviewed and taken their blood samples for investigation. Mothers, families and all participants were educated on the relevance of the study and included in the research based on their consent to participate.

Informed consent
The respondents were requested to participate in the research by answering the questionnaire through the research assistants and allowing them to test for HBsAg. Their participation was voluntary and they had the freedom to withdraw at any time if they might feel so and there was no victimization for any refusal to participate or withdrawal.

Privacy and Confidentiality
All information provided to the interviewers was strictly kept confidential and records securely stored in a locker. All information that respondents disclosed were handled with security and confidentiality.

Anonymity
The participant's name and identity were kept anonymous. Only their responses and findings were presented in the study.

RESULTS
During the study period of between 1st August and 31st October 2017, a total of three hundred and sixty four (N=364) pregnant women who attended at SOS Mother and Child Hospital for ANC services were enrolled in the study. This hospital is the only one of its kind in the country which has been offering free health services to mothers and children since early 1990s. These services are mainly utilized by patients and clients from poor urban and rural communities living mainly in South and central zones.

Demographic characteristics of the respondents
In this study 364 (100%) of the required sample pregnant women attending antenatal care were participated in the study. The mean age of the respondents was 24.65 (±6.05) years. A

majority of the respondents (56.3%) were in the age group of 20-29 years and about 21.2%, 20.9% & 1.6 % were in the age groups of 10-19, 30-39, & ≥40 years respectively. The most remarkable result to emerge from the data is that the pregnant women had age range of 13-42 years. The study also shows that majority of the women interviewed were married (94.0%) whose majority had no formal education (73.1%) as depicted in table 1 below.

Table 1: Demographic characteristics of the respondents

Variable	Frequency (%)
Residence	
Urban	327 (89.8)
Rural	37 (10.2)
Age	
10-19	77(21.2)
20-29	205(56.3)
30-39	76(20.9)
≥40	6(1.6)
Marital status	
Married	342 (94.0)
Divorced	19(5.20)
Widow	3(0.80)
Educational level	
No formal education	266 (73.1)
Primary school	54(14.80)
Secondary school	34(9.30)
Post-secondary	10(2.70)

Socio-economic characteristics of pregnant women (N=364)

As demonstrated by the table 2 below, majority of the respondents (96.4%) were unemployed, only the remaining (3.6%) were self-employed of small businesses. According to their economic status, the study has also identified that most of the interviewed women (79.1%) were from families of low economic status, while only small proportions of 18.7% and 2.2% of them were from families of middle and high economic status respectively. Among the respondents 20.9% have only ever engaged in more than one marriage compared to their husbands who did so (28.6%).

Table 2: Socio-economic characteristics of the respondents

Variable	Frequency (%)
Employment status	
Employed	13(3.6)
Unemployed	351(96.4)
Economic status	
High	8(2.2)
Middle	68(18.7)
Low	288(79.1)
No. of marriages engaged by the women	
One	288(79.1)
More than one	76(20.9)
No. of marriages engaged by the husband	
One	260 (71.4)
More than one	104 (28.6

Obstetric Characteristics of Pregnant Women

Regarding with obstetric characteristics of the respondents, the study revealed that majority of the women (53.8%) have already had 1-3 pregnancies on the period of data collection while some 27.5% have had 4-6 pregnancies with average of 3.9. Similarly, majority (53.8%) of the women had delivered 0-2 babies while 45.9% delivered 3 and more.

Moreover, the study found that 36.5% of the interviewed women delivered at a hospital and attended by qualified health professional while more than a third (34.6%) delivered at home by TBAs. However, there was small percentage of (5.8%) who delivered at health centers (EPHS) and others 23.1% were primagravidae. Furthermore, as shown in the below table some 26.1% of the respondents experienced abortion.

Table 3: Obstetric characteristics

Variable	Frequency (%)
Gravida	
1-3	196(53.8)
4-6	100(27.5)
7 or more	68(18.7)
Para	
0-2	197(54.1)
3-5	99(27.2)
>5	68(18.7)
Delivery site	
Home	126(34.6)
Health centre	21(5.8)
Hospital	133(36.5)
NA (Prima gravida)	84 (23.1)
Birth Attendant	
TBA	135(37.1)
Qualified health professional	143(39.3)
NA (Prima gravida)	86(23.6)
History of abortion	
Yes	95(26.1)
No	269(73.9)

Risk characteristics

Traditionally, it is customary that Somali girls pierce the ears at childhood and this study revealed that majority of the respondents (96.7%) had pierced the ears. Besides that the study showed that 90.4%, 32.7% and 41.2% had a history of injection, blood transfusion and minor or major surgical procedures respectively.

Table 4: Risk characteristics

Variable	Frequency (%)
History of ear piercing	
Yes	352(96.7)
No	12(3.3)
History of injection	
Yes	329(90.4)
No	35(9.6)
History blood transfusion	
Yes	119(32.7)
No	245(67.3)
History of surgical procedure	
Yes	150(41.2)
No	214 (58.8)

Demographic characteristics of the study participants and HBsAg serostatus

Study has found that majority 227(62.36%) were urban residents of whom 15 (4.12%) tested positive to HBsAg. This means that all positives were from urban residents. According to age brackets, women in the age group of 10-19 were 77 (21.15%) of whom 1 tested positive while the majority of the respondents 205(56.31) lie in the age brackets of 20-29 of whom 7 tested positive. Noteworthy is that the bracket 30-39 comprised of 76 (20.88%), 7 tested positive.

On the other hand, with respect to marital status, almost all (93.95%) of the interviewed respondents in the study period were married of whom all the 15 cases found in this category. Level of education, most of the respondents (73.07%) had no formal education and the most positives 10 out of 15 (67%) were found in this category.

Table 5: Demographic characteristics in relation to Hepatitis B serostatus

Characteristics	No.	HBsAg serostatus	
		HBsAg +ve	HBsAg –ve
Residence			
Urban	227	15(4.6)	212(93.4)
Rural	37	0(0.0)	0(0.00)
Age			
10-19	77	1(1.3)	76(98.70)
20-29	205	7(3.4)	198(96.60)
30-39	76	7(9.2)	69(90.80)
$\geq$40	6	0(0.0)	6(100.00)
Marital status			
Single	0	0(0.0)	0(0.00)
Married	342	15(4.4)	327(95.60)
Divorced	19	0(0.0)	19(100.00)
Widow	3	0(0.0)	3(100.00)
Education level			
No formal education	266	10(3.8)	256(96.20)
Primary school	54	3(5.6)	51(94.40)
Secondary school	34	2(5.9)	32(94.10)
Post-secondary	10	0(0.0)	10(100.0)

Socioeconomic characteristics of the study participants and HBsAg serostatus

The study has also shown that pregnant women who tested positive were almost all (96.98%) unemployed. They were in low economic status category (79.12%) and again most of them engaged only one marriage.

<div align="center">

Table 6: Socio-economic characteristics and Hepatitis B serostatus

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Characteristics	No.	HBsAg serostatus	
		HBsAg +ve	HBsAg -ve
Employment status			
Employed	11	1(9.1)	10(90.9)
Unemployed	353	14(4.0)	339(96.0)
Economic status			
High			
Middle	8	0(0.0)	8(100.0)
Low	68	1(1.5)	67(98.5)
Number of marriages engaged by the wife	288	14(4.9)	274(95.1)
One			
More than One	288	11(3.8)	277(96.2)
Number of marriages engaged by the husband	76	4(5.3)	72(94.7)
One	260	8(3.1)	252(96.9)
More than	104	7(6.7)	97(93.3)

Obstetric characteristics of the study participants and HBsAg serostatus

The study has demonstrated that women who conceived 1-3 pregnancies were 196 in number of whom 5 tested positive. Similarly those with previous conception of between 4-6 were 101 of whom 7 tested positive.

<div align="center">

Table 7: Obstetric characteristics in relation to Hepatitis B serostatus

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Characteristics	No.	HBsAg serostatus	
		HBsAg +ve	HBsAg –ve
Gravida			
1-3	196	5(2.6)	191(97.4)
4-6	101	7(6.93)	94(93.07)
7 or more	68	3(4.41)	65(95.59)
Para			
0-2			
3-5	197	6(3.05)	191(96.95)
>5	99	6(6.06)	93(93.94)
Delivery Site	68	3(4.41)	65(95.59)
Home			
Health centre	126	9(7.10)	117(92.90)
Hospital	21	0(0.00)	21(100.0)
NA(Primagravida)	133	3(2.30)	130(97.70)
Birth Attendant	84	3(3.60)	81(96.40)
TBA			
Qualified Health Professional	135	9(6.70)	126(93.30)
NA(Prmagravida)	143	3(2.10)	140(97.90)
	86	3(3.50)	83(96.50)
History of abortion			
Yes	95	4(4.20)	91(95.80)
No	269	11(4.10)	258(95.90)

Risk characteristics of the study participants and HBsAg serostatus

The study has found that the majority 352(96.7%) of the study participants had a history of ear or nose piercing and all positive participants lie in this category. Similarly, most of the participants 329 (90.38%) underwent a history of injection. Furthermore, one third125 (34.34%) and almost half 150 (41.21%) of the interviewed pregnant women had a history of

blood transfusion and a minor or major surgical procedure in their lifetime. Out of the above mentioned figures, nine (9) of those who had a history of blood transfusion tested positive while only six (6) tested positive for those who had a history of surgical procedure.

Table 8: Risk characteristics in relation to Hepatitis B serostatus

Characteristics	No.	HBsAg serostatus	
		HBsAg +ve	HBsAg –ve
History of ear piercing			
Yes	352	15(4.3)	337(95.7)
No	12	0(0.0)	12(100.0)
History of injection			
Yes			
No	329	13(4.0)	316(96.0)
History of blood transfusion	35	2(5.7)	33(94.30)
Yes	125	9(7.20)	116(92.80)
No	239	6(2.51)	233(97.49)
History of surgical procedure	150	6(4.0)	144(96.0)
Yes	214	9(7.1)	117(92.9)
No			

Association between baseline and risk characteristics and Hepatitis B Surface Antigen

The results in Table 9 show that the mothers whose age between 30 and older are more likely to get hepatitis B compared to those whose age is younger than 30 (OR 1.0 95%CI 1.11-1.89). Moreover, mothers in the low economic status are 2.1 times more likely to contract Hepatitis B compared to the pregnant women who are in the category of middle and high economic status (OR 2.1 95% CI 1.25-3.21).

The study found that gravidity is significantly associated with Hepatitis B. As shown in table 6, mothers with gravidity of 7 and more were 2.1 times (OR 2.1, 95%CI 1.31-3.04) more likely to get hepatitis B compared to mothers with gravidity between1-6. The study has also shown that the mothers delivered by skilled birth attendant and those who have not yet delivered (primagravidae) were less likely to get hepatitis B compared to those mothers delivered by traditional birth attendant [0.68 (0.09-0.98)and 0.12 (0.01-0.77)].

Pregnant women who had abortion were 5.8 times more likely to get hepatitis B compared to those pregnant women who had no abortion (OR 5.80, 95%CI 1.93 – 17.42).

Education, employment, number of marriages engaged, ear piercing and history of blood transfusion were not significant in the study.

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Table 9: Association between demographic, socio-economic, obstetric and risk characteristics and presence of HBsAg

Characteristics	N	HBsAg Positive n (%)	OR	95% CI
Age				
10-29	282	8(2.84)	1.0	
30 and older	82	7(8.54)	1.69	1.11-1.89
Marital status				
Married	342	15(4.39)	7.36	.
Divorced	19	0(0.00)	.	.
Widow	3	0(0.00)	.	.
Education				
No formal education	266	10(3.67)	1.0	
Formal education	98	5(5.10)	0.73	0.24-2.18
Employment status	11	1(9.1)	1.0	
Employment	354	14(3.95)	0.413	0.05-3.45
Unemployed	8	0(0.00)	1.0	
Economic status	68	1(1.47)	1.6	0.87-2.11
High	288	14(4.86)	2.1	1.25-3.21
Middle				
Low				
No. of marriages engaged by the wife	288	11(3.82)	1.0	
	76	4(6.7)	1.3	0.57-1.89
One	196	5(2.55)	1.0	
More than one	100	7(7.00)	0.87	0.23-1.34
Gravida	68	3(4.41)	2.1	1.31-3.04
1-3				
4-6	197	6(3.05)	1.0	
7 or more	99	6(6.06)	0.68	0.17-2.80
Para	68	3(4.41)	1.39	0.33-5.79
0-2				
3-5	135	11(8.15)	1.0	
>5	143	1(0.70)	0.68	0.09-0.98
Birth attendant	86	3(3.49)	0.12	0.01-0.77
TBA				
Health professional	296	5(1.86)	1.0	
Primigravidae	95	10(10.53)	5.80	1.93-17.42
History of abortion				
No				
Yes	12	0(0.00)	1.0	
History of ear piercing	352	15(4.26)	0.00	0.00
No	35	2(5.71)	1.0	
Yes	329	13(3.95)	1.51	0.19-11.85
History of injection				
No				
Yes	239	6(2.51)	1.0	
History of blood transfusion	125	9(7.20)	1.1	0.25-1.67
No				
Yes				

DISCUSSION

Baseline characteristics

The mean age of the respondents was 24.65 (±6.05) years. A majority of the respondents (56.3%) were in the age group of 20-29 years and about 21.2%, 20.9% & 1.6 % were in the age

groups of 10-19, 30-39, & ≥40 years respectively. The most remarkable result to emerge from the data is that the pregnant women had age range of 13-42 years. It was found that women in the age category of (≥30) were more likely to get Hepatitis B compared to those below categories (OR 1.69, 95%CI 1.11-1.89).

The study also shows that majority of the women interviewed were married (94.0%) whose majority (73.1%) had no formal education. Education is one of the most important means of empowering women with the knowledge, skills and self-confidence necessary to participate fully in the development process in which the majority of Somali women are lacking and it is against the Universal Declaration of Human Rights asserted that "everyone has the right to education".

Similarly, as much as 96.4% of the respondents were unemployed whose majority (79.1%) were from families of low economic status. Moreover, mothers in the low economic status are 2.1 times more likely to contract Hepatitis B compared to the pregnant women who are in the category of middle and high economic status (OR 2.1 95% CI 1.25-3.21).

Regarding with obstetric characteristics, the study revealed that more than half (53.8%) of the women have already conceived 1-3 pregnancies on the period of data collection with average pregnancies of 3.9 in range of (1-15). The study reported that mothers with gravidity of 7 and more were 2.1 times (OR 2.1, 95%CI 1.31-3.04) more likely to get hepatitis B compared to mothers with gravidity between1-6. Moreover, only around one-third of (36.5%) of the interviewed women delivered at a hospital who were attended by qualified health professional while another third (34.6%) delivered at home by TBAs. However, there were small percentage of (5.8%) who delivered at health centers and others 23.1% were primagravidae. Furthermore, the study reported that more than a quarter (26.1%) of the respondents experienced abortion and aborted women were 5.8 times more likely to get hepatitis B compared to those pregnant women who had not experienced abortion (OR 5.80, 95%CI 1.93 – 17.42).

This result is in line with study conducted in Kenya by Jacqueline et al (2016) who found that parity and abortion have association with Hepatitis B [parity (χ^2 =7.128 df2 p<0.01), History of abortions (χ^2=9.094 df1 p<0.01)].

Traditionally, it is customary that Somali girls pierce the ears at childhood and this study revealed that majority of the respondents (96.7%) had pierced the ears. Besides that the study showed that 90.4%, 32.7% and 41.2% had a history of injection, blood transfusion and minor or major surgical procedures respectively.

Marital status, education, employment, number of marriages engaged, parity, ear/nose piercing, history of injection and blood transfusion were not significantly associated with Hepatitis B.

Prevalence of Hepatitis B among pregnant women
Hepatitis B virus (HBV) infection in a pregnant woman poses a serious risk to her infant at birth. Without postexposure immunoprophylaxis, approximately 40% of infants born to HBV-infected mothers in the United States will develop chronic HBV infection, approximately one-fourth of whom will eventually die from chronic liver disease.

This study has found that the seroprevalence of HBsAg among pregnant women attending at SOS Mother and Child Hospital was 4.12%. According to WHO, the prevalence of chronic HBV

infection in general population varies geographically, from high (>8%), intermediate (2-7%) to low (<2%) prevalence. WHO EMRO region was known to be a region of low-to-intermediate endemicity, and the study has confirmed that Somalia still remains in the category (WHO, 2017). However, this prevalence is significantly higher than almost all the countries in EMRO region.

Infection with HBV among pregnant women has been reported in a number of African countries. For instance, a study established in Kenya found that that the prevalence of HBV infections among pregnant women attending antenatal clinic at Mbagathi District Hospital was 3.8%. Another study done in Ethiopia determined that the prevalence of HBV infection among pregnant women was 6.9% (Abdi et al, 2016). A much higher prevalence of 11.0% has been reported from Guiana (Mahamat et al, 2010). In Nigeria, the seroprevalence among attendees of ANC was reported as 6.08% (Rabiu et al, 2010). On the other hand, HBsAg was detected in 1.5% pregnant women in Libya (El-Magrahe et al, 2010).

CONCLUSION AND RECOMMENDATION

Conclusion

The mean age of the respondents was 24.65 (±6.05) years. A majority of the respondents (56.3%) were in the age group of 20-29 years and about 21.2%, 20.9% & 1.6 % were in the age groups of 10-19, 30-39, & ≥40 years respectively. The most notable result to emerge from the data is that the pregnant women had age range of 13-42 years. It was found that women in the age category of (≥30) were more likely to get Hepatitis B compared to those below categories (OR 1.69, 95%CI 1.11-1.89).

Similarly, as much as 96.4% of the respondents were unemployed whose majority (79.1%) were from families of low economic status. Moreover, mothers in the low economic status are 2.1 times more likely to contract Hepatitis B compared to the pregnant women who are in the category of middle and high economic status (OR 2.1 95% CI 1.25-3.21).

Concerning with obstetric characteristics, the study revealed that more than half (53.8%) of the women have already conceived 1-3 pregnancies on the period of data collection with average pregnancies of 3.9 in range of (1-15). The study reported that mothers with gravidity of 7 and more were 2.1 times (OR 2.1, 95%CI 1.31-3.04) more likely to get hepatitis B compared to mothers with gravidity between1-6. Moreover, only around one-third of (36.5%) of the interviewed women delivered at a hospital who were attended by qualified health professional while another third (34.6%) delivered at home by TBAs.

This study has found that the seroprevalence of HBsAg among pregnant women attending at SOS Mother and Child Hospital was 4.12%.

Recommendation

Ministry of Health Somalia, management of Hospitals, Health centers and MCHs should adopt a proper prevention and control intervention guidelines which consider the following points:
- Trainings and awareness sessions on Hepatitis B risk behaviors and transmission for workers and community should be maintained
- Health workers at hospitals be offered Hepatitis B vaccinations
- Universal screening of all pregnant women for HBsAg during each pregnancy
- Case management of HBsAg-positive mothers and their infants
- Provision of immunoprophylaxis for infants born to infected mothers, including hepatitis B vaccine and hepatitis B immune globulin

- Routine vaccination of all infants with the hepatitis B vaccine series, with the first dose administered at birth
- Further study needs to be conducted to examine the possibility and extent of co-infection on large scale throughout the nation.

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The Feasibility Analysis and Scheme Design of Raw Milk Price Index Insurance in China

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ABSTRACT

Dairy producers in China has been suffering from more and more frequently raw milk price fluctuations in recent years. Price Index insurance can be an effective tool of market risk management. We find that there are foreseeable trend, cyclical and seasonal factors in raw milk price fluctuations, and also systematicness in price risk, which make the raw milk price risk uninsurable. But by rationally designing the insurance scheme and institutional innovations, the price risks could become insurable. The choice and construction of milk price index are the core tasks of the scheme design. Income over feed cost could well reflect the actual profitability of milk production and is good to be used as milk price index. To prevent moral hazards and adverse selection, the contract should make stipulations on the coverage level from aspects of production covered and risk retention. We also carry a calculation of actuarially fair premium for the designed insurance contract using distribution approximation and Monte Carlo stimulation.

Keywords: Raw milk, Price index insurance, Feasibility, Insurance scheme

INTRODUCTION

Agricultural insurance programs have been developing steadily under the supporting policies of government in China since 2007. And they play important roles in protecting agricultural production, stabilizing farmers' income and guaranteeing the national food security. In 2016, the total gross premium of agricultural insurance in China increased to 41.77 billion RMB by 11.42% from 2015 and achieved a 0.1 percentage point growth of its proportion in non-life insurance sector with 4.79%. The government fund for agricultural insurance premium subsidies in 2016 was 15.83 billion RMB, which increased by 7.47% from 2015. 204 million farmer households were covered by the insurance programs with a total insurance amount of 2.16 trillion RMB.

The existing products are mainly designed to cover the loss risks caused by natural disasters, plants' or animals' diseases and accidents. There's still a lack of protection for market risk, such as price risks and margin risks in agricultural production and operation. In 2011, Shanghai government and Anxin Agricultural Insurance Company took the lead in conducting a vegetable price index insurance plot, which received widely attention and favorable comments. Beijing government and Anhua Agricultural Insurance Company set up swine price index insurance plot in 2013. In 2014, the central government No.1 document proposed to explore carrying out crops and livestock price insurance plots. Since then, many provinces began to conduct price insurance programs on farm produce like swine and vegetable one after another, which showed a rapid development trend.

Dairy products have become important side dishes for Chinese homes in recent years. China's milk productivity ranks 3rd in the world, and the increasing dairy consumption is promoting the unceasing growth of the number of dairy cows. But for the lack of available market risk management tools, the price of raw milk went through several great fluctuations in the past

few years, which resulted in the alternate phenomenon of "low price hurts famers" and "high price hurts consumers". The market risks dairy producers faced have become far higher than the natural risks. Most of the dairy cattle herds in China are in small scale with cows less than 100. It's not convenient for them to use futures or options market which have relative high thresholds to hedge risks. Actually, there are still no dairy milk future and related option products now in China yet. Meanwhile, compared with the government behaviors of direct agricultural products purchasing and subsidies, insurance tools have higher efficiency in maintaining the market order and the self-adjust of commodity prices. Therefore the best choice for spreading the market risks in dairy milk production is to design and carry out insurance programs for milk price. Take "index" instead of the actual price received by dairy producers as basis of measuring losses can effectively decrease the transaction cost of insurance contracts and avoid moral hazards and adverse selection.

LITERATURE REVIEW

History of insuring agricultural products price risks is not long in the world. So the researches about risk management of agricultural products prices, especially of milk price are still limited in number.

Chuhui Liao(2012) did a case study about the cost based vegetable price insurance program operated by Shanghai Anxin Agricultural Insurance Company, and concluded that the insurance project could effectively stabilize vegetable supply and didn't cause welfare dissipation because of the appropriate insured amount control [4]. Qiao Zhang(2013) designed a scheme of eggs price insurance for Beijing after analyzing the fluctuation patterns of eggs price and egg-to-feed price ratio. But the feasibility analysis of this scheme was not referred and it's also difficult to put into practice [13]. Ke Wang(2014) regarded adverse selection as the core problem of swine price insurance development based on investigation of foreign experiences. He also suggested that the scheme design should comply with the needs of actual production and spread the underwriting risks as far as possible [9]. And it's quite important to improve the market price monitor system. Qiao Zhang(2015) found that though price risks had systematic and partly expectable characteristics, they could be turned into insurable risks by technical and institutional innovations [12]. He also put forward the key points of designing swine price insurance program in China. Later in 2016, Qiao Zhang pointed that the two key problems in large-scale application of agricultural products price insurance were setting up the insurance indicator and trigger value and catastrophic risks. The future markets could effectively solve these problems considering their price discovery and risk transfer function. Starting from talking about the necessity and development situation, Hui Tian (2016) analyzed the main difficulties and principles of developing agricultural products price insurance in China [8]. Guodong and Ke (2016) introduced the concept of agricultural products price insurance and proposed design framework for this kind of insurance products taking raw milk margin protection insurance as example [7].

In recent years, many foreign scholars have studied on the field of livestock products market risk management, including dairy milk, from several aspects. Cabrera and Solis (2008) evaluated the effectivity of weather forecasts in managing "Livestock Gross Margin- Dairy" (LGM-D) using data of dairy herds in Wisconsin [2]. Cabrera (2009) discussed the relationships between the factors like feed quantity insured and premiums or the guaranteed gross margin, and found strong negative correlations between deductibles and premium, corn insured and guaranteed gross margin [3]. M.Valvekar (2010) recommended dairy producers who had enrolled in LGM-D making purchasing plans to save premium cost [18]. C.A.Wolf (2010) examined the using of milk-to-feed price ratio as proxy for dairy farm profitability, and

concluded that income over feed cost (IOFC) could be a better profitability indicator when both milk price and feed costs in high volatility [20]. His another research (2012) proved that more and more dairy producers were managing both milk and feed price risks simultaneously [21]. Operations with larger scales, more shareholders and younger managers generally had higher enthusiasm in risk management. Marin（2014）investigated dairy producers' understanding , attitudes, impression and participation willingness towards Margin Protection Program (MPP) [1]. Tyler and Kenneth (2015) evaluated the efficiency of MPP in increasing producers' income and decreasing risks using data of 13 dairy production areas from 2002-2013, and concluded that this program was indeed helpful and effective after comparing it with LGM [10].

The existing researches verified the positive significance of price insurance in lowering market risks faced by agricultural producers in production and operation, and also provide good references for our scheme design of raw milk price index insurance that suitable to Chinese reality.

FEASIBILITY OF RAW MILK PRICE INDEX INSURANCE
Fluctuation Characteristics of Raw Milk Price
Influenced by the "Sanlu" incident, the raw milk price kept going down in a short period after that and began to slowly revive until the second half of 2009. After a relatively long period of steadily increase, the raw milk price sharply fell again in 2014. The main reason for this was that the government introduced more preferential import policy for foreign dairy products, which led to a flood of foreign milk into domestic market and strongly struck the home produces.

To clearly understand the historical fluctuation characteristics of raw milk price in China market, we do seasonal adjustments and decomposition of the price series with X-12 seasonal adjustment method and Hodrick-Prescott filter. We find there were trend and cyclical factors, seasonal factors and irregular factors in the raw milk price fluctuation.

Trend and cyclical factors
Figure1 shows that the raw milk price was in an increase trend for a long period during the past 10 years, but turned around and kept descending from 2014. After removing the long term trend from trend and cycle series, we get the cycle moving series of raw milk price. With the "peak to peak" cycle partition method, we can divide the period from July, 2008 to September, 2017 into three fluctuation periods. The length of the first period is 33 months from July, 2008 to April, 2011. The second is 34 months from May, 2011 to March, 2014. And the last is not ended yet and has been 39 months long from April, 2014. The lengths of these 3 period are all about 3 years. From the view of moving path, the downward phase of raw milk price of the first and third cycle both continued for 13 months, during which the price decreased sharply. Comparatively, the second cycle was steadier, and the decreasing period was longer. Meanwhile, we can see that the raw milk price didn't pick up rapidly after the steep decline in the last cycle as the former cycles did. The possible explanation is that, affected by price collapse of global milk price, the processing operations preferred to use imported raw milk which has higher cost-performance. The oversupply of domestic milk resulted in the below-cost price. Although the government has taken a series of emergency measures, the impacts of low cost foreign raw milk would be still there in the foreseeable future.
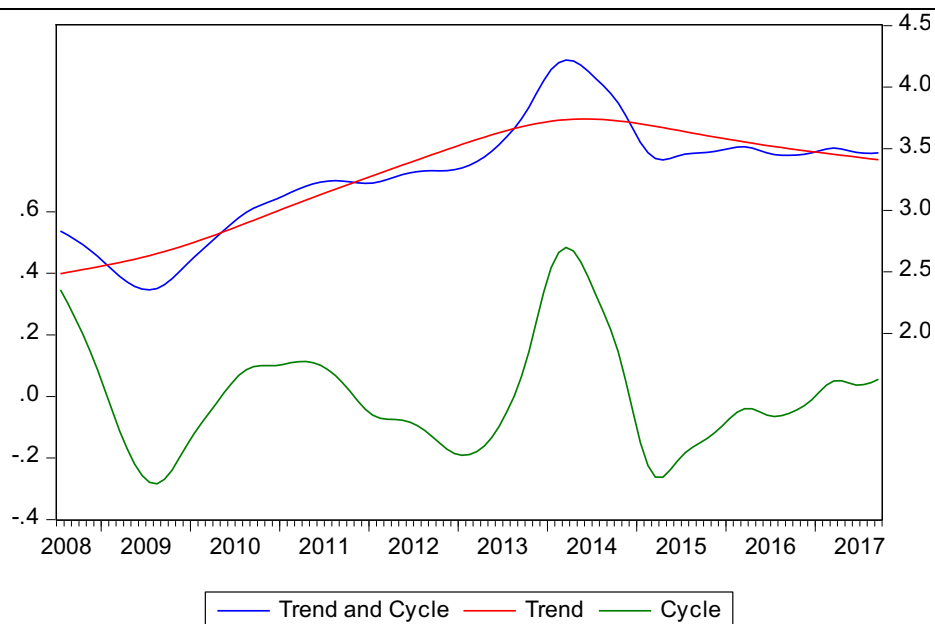
Figure 1. Trend and Cyclical Fluctuation of National Average Price of Raw Milk (monthly)

Seasonal factors

Figure2 illustrates the regularly seasonal fluctuations of raw milk price in China. The peak were all in January in every year, and valley in August. From every September, the price began to recover and reached the top point in the next January. From the view of fluctuation amplitude, the influence of seasonal factors has been getting slighter.
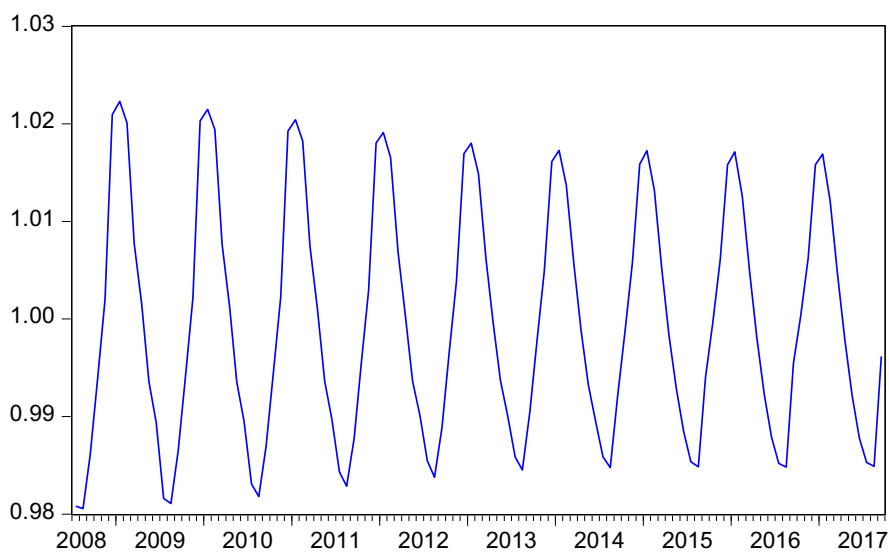

Figure 2. Seasonal Fluctuation of National Average Price of Raw Milk (monthly)

Irregular factors

Figure3 shows that there are irregular factors in raw milk price fluctuations besides regular ones. Irregular events are contingent and difficult to foresee. And we find the irregular volatility has been becoming stronger in the past years.
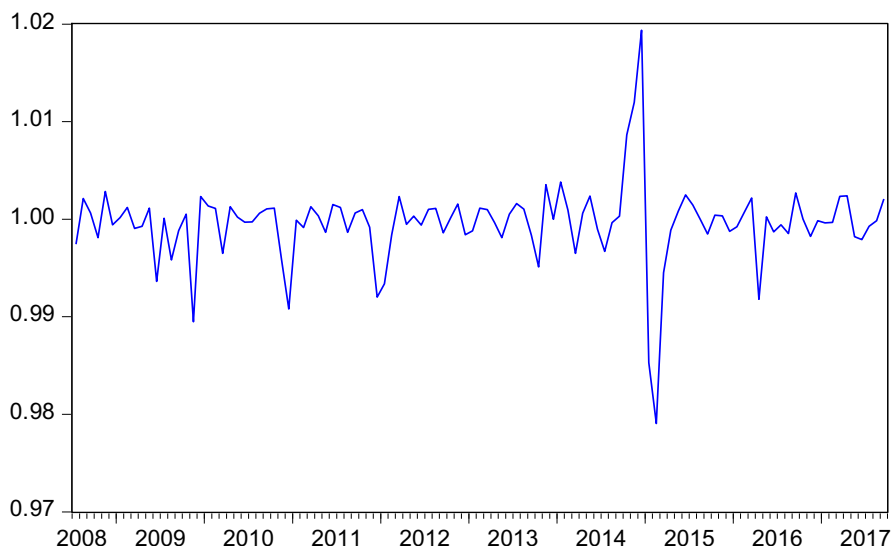
Figure 3. Irregular Fluctuation of National Average Price of Raw Milk (monthly)

Feasibility Analysis and Foreign Experience
Feasibility of insuring price risk
Insurable risks are risks that meet all the criteria for efficient insurance, which is the fundamental principle of designing any insurance product. To be an insurable risk, it should meet the following requirements: Firstly, the insurer must be able to measure the premium which can cover the claims and operating expenses, or to say it cannot be catastrophic or so large that nobody want to insure it. Secondly, the loss must be able to be measured by money. Thirdly, the happening of loss should be random. In other words, the risks need to be unforeseeable and the insured cannot exert influence on the happening of loss, or the insurers will get into trouble of adverse selection. Fourthly, the risks must be able to be spread from the points of space or time to maintain the sustainability of insurance operation [11].

However, we find there are significant cyclical and seasonal characteristics in raw milk price fluctuations, which means the price risk is not completely random. The potential problem of insuring it is a great possibility of adverse selection. Dairy producers will make expectations about the milk price in a future time using their experiences and historical information. They'll purchase insurance only when they expect the price would go down. This will increase insurers' operating risks, which may result in higher premium or quit concern. That will be a no-win situation or both sides. Meanwhile, price risks are strongly systematic, and could be only spread over time while couldn't in space, which is a seed of catastrophe events. Once serious incident happens, the indemnity responsibility could be destructive for the insurers.

But this doesn't mean that price risks can't be insured. By technical and institutional innovations, the impacts of uninsurable elements can be weaken. As for the ubiquitous problem of relatively high premium of agricultural insurance, the government could solve it by fiscal subsidies or other political support. Besides, by creatively designing insurance scheme, such as setting up stipulation on coverage level from aspects of production covered and risk retention, we can mostly avoid the happening of adverse selection. The government could collaborate with insurance companies in establishing catastrophic risks protection system and discussing the reasonable plan.

Foreign Experiences
There have been many related practices in oversea countries like United States and Canada. Most of them are in form of revenue insurance. Revenue insurance is a good risk management method for many agricultural products. Because supply, which is a key determinant of market

price, is determined by production, then production and price usually move inversely. The insurance indicator of revenue insurance is the unit price multiplied by production. So it actually covered both natural and market risks. Revenue insurance products are more attractive to producers of main crops, which are under both natural and market risks, such as corn, soybean, and cotton and so on. But for livestock products, natural risks are comparatively light, and the main risks faced with production activities are from the market. Moreover, the productivity of livestock products are easily subject to human influence, which prone to induce moral hazards [9].

There are only 4 protection programs specialized for agricultural products price risks in practice. They are Livestock Risk Protection Program (LRP), Livestock Gross Margin Program (LGM) and Margin Protection Program for Dairy Producers (MPP) of United States, and the Western Price Insurance Program (WLPIP) of Canada. LRP and WLPIP are in similar form of taking product price as insurance indicator and paying the differences between the contracts agreed price and the actual price to the insured when the actual price is lower than the agreed. LGM is a protection program for the gross margin of swine and dairy milk, while MPP is only available for Dairy producers. The LGM-D and MPP are the same in using income over feed cost per hundred pounds (IOFC) as insurance indicator. But there are also many differences between them. Firstly, the feed ration coefficients of LGM-D can be adjusted by the producers within a certain interval to accommodate their individualized demands, while the coefficients of MPP are fixed according to the 2014 Farm Bill. Secondly, production and length to be covered in LGM-D are customizable, and indemnities are only paid when the average IOFC in the whole contract duration is less than the guaranteed value, while MPP requires a fixed historical productivity and only covers a certain proportion of it during the whole contract period, and the indemnities are calculated on every two-month basis. Thirdly, the guaranteed gross margin and premium in LGM-D are based on the future prices of milk and feed in the register period, and the insurance premiums are actuarially fair and calculated separately. While the guaranteed levels of MPP are fixed from $4 to 8$ per hundred pounds with the intervals of 50 cents, the premium for each guarantee is fixed too, not reflecting the changes of risk environment.

SCHEME DESIGN OF RAW MILK PRICE INDEX INSURANCE

There are four key points in designing the framework of raw milk price index program, one is the choice of insurance indicator, in other words the milk price index. The other one is the index construction. The third is to scientifically make contract clauses to avoid moral hazards and adverse selection. And the last one is calculation of insured amount and premium.

Insurance Indicator

Price index is the indicator used in raw milk price index insurance to measure dairy producers' gross margin and as the basis of indemnity payments. So the choice of milk price index is the core of the scheme design. There are mainly three alternatives of milk price index throughout the world, milk price (MP), milk-to-feed price ratio (MF) and the income over feed cost (IOFC). MP refers to the average price of per unit weight milk (like 1 kilograms, 50 kilograms or 100 pounds) received by the dairy producers in certain areas. The advantage of taking MP as insurance indicator is that it could be easy to design the contract and easy for farmers to understand, and the data used is easy to acquire. But there's still a serious defect that the milk price cannot truly reflect dairy producers' actual profitability. The price risks faced with dairy production are not only from the final products, but also the inputs. In short terms, the profitability may not decrease when the low milk price is caused by cost reduction, while the insured producers may could claim for payment for the decreased MP. However, when the cost

substantially rises and the supply-demand balance adjustment moves slowly, the MP can't increase to the level of reasonable return, the insurance maybe can't pay enough for the margin losses, which will result in insurance inefficiency. So we need to involve the main measurable variable costs into consideration when constructing milk price index.

According to the "The Collection of Cost and Benefit of National Agricultural Products" published by China National Statistics Bureau, feed cost accounted for about 65% of the total cost of dairy cow raising and 80% of the material and service expenses in recent years. Feed price changing is an important reason for milk price fluctuation. Producers' profitability would be probably brought down by increasing feed prices. And feed costs are comparatively more region homogeneous and easier to measure than labor and land cost. Therefore, the existing foreign milk price index insurance programs all put feed cost into the price index as representative of production cost, and the main forms are MF and IOFC.

United States Department of Agriculture has always taken MF as proxy for milk production profitability. It's defined as the all-milk price per hundredweight (in dollars) divided by a feed price index, which is the cost of 100 pounds of a representative feed ration. It's similar with the ratios used in some other livestock sectors, such as swine-corn price ratio and broiler-corn ratio [20]. This product-feed price ratios can easily and quickly reduce the impact of feed price changes on milk price, especially when only one factor of milk and feed price in great variation. But when milk and feed price both fluctuate and in the same direction, the MF may change little, while the margin received by producers can be totally different. For example, when the MF is 2.5 and the milk price is 150RMB/50kg, the implied feed cost and gross margin are 60RMB and 90RMB. However, when the milk price is 100RMB/50kg and MF doesn't change, the margin decreases to only 60RMB.

We think IOFC could be a better indicator for our raw milk price index insurance scheme. First of all, it can better reflect dairy producers' real profitability by taking feed cost into account, which is in line with the objective of developing milk price insurance. Secondly, as a representative of gross margin, IOFC, to some extent, can be a reflection of farmers' expectation on future profitability. Finally, for IOFC is determined by several prices, it's more random than the single milk price, which is helpful to avoid adverse selection. Taking IOFC as the insurance indicator, the insured and insurer need to set a reasonable guarantee level in the insurance contract. When the actual IOFC calculated using statistic data in the prescribed area falls below the guarantee level in the insurance period, the difference between them shall be paid to the insured dairy producers.

Price Index Construction
The milk price index we constructed is as the follow:

$$\text{PIn} = P_m - \sum Q_i \text{P}_i$$

We take 50kg as milk production unit in price index calculation. In the above formula, "PIn" refers to raw milk price index, IOFC. "P_m" is the raw milk price per 50kg received by producers (in RMB). "Q_i" is the quantity of feed "i" consumed for 50kg milk production (in kilograms), and P_i is the price per kilograms of feed "i" (in RMB).

Before the index construction, we should know the general feed ration of dairy cow raising in China. The feed for cow herds are composed of concentrated feed and coarse fodder. Concentrated feed mainly includes corn, oil-seed-meal and soybean, and coarse fodder consists of silage, alfalfa hay, green grass and residual forage. Among these, corn, oil-seed-meal, silage

corn and alfalfa hay are respectively the main concentrated and coarse feed, which account for 75% and 70%~80% of the two kinds of feed. For the strong substitution and price relevance among different oil-seed-meals, we take soybean meal, which is the most widely used in cow raising, as representative. Silage corn price usually change in the same direction with corn price and significantly influenced by it. So we can covert silage corn into corn at a certain ratio. Then the feed ration of dairy cow raising could be represented by corn, soybean meal and alfalfa hay.

With the data published by China Ministry of Agriculture and other public information, we can calculate the coefficients of each feed in the index. The data used here is national data of 2015. The calculating process is as follows:
1kg milk called for 0.5316kg concentrated feed. Considering the most typical concentrated feed ration of 50% corn and 25% soybean meal, the corn and soybean meal consumption for 1kg milk production were 0.2658kg and 0.1329kg. The silage corn consumption for each production of 1kg milk was 1.0927kg. As silage corn price is highly correlated with corn, we convert it into corn using their price ratio 0.1495 as conversion factor. As for alfalfa hay, the feed consumption for 1kg milk production was 0.0799kg, in which 60% was domestic production and the other 40% was imported. The acceptable price of domestic alfalfa hay price for dairy cow raising is considered to be 70% of the imported. So the domestic price can be expressed as imported alfalfa hay price multiplied 0.7. Therefore the alfalfa hay price in the index can be calculated by the following formula: $P_{al} = 0.6P_{alf} + 0.4 \times 0.7P_{alf} = 0.88P_{alf}$. P_{al} refers to the alfalfa hay price that we use in the milk price index, and P_{alf} is the price of imported alfalfa hay (in RMB).

Then, the integrated milk price index is:

$$\text{PIn} = P_m - 21.46P_c - 6.645P_s - 3.515P_{alf}$$

P_c and P_s represent per kilograms price of corn and soybean meal. Limited by data availability, the data used in milk price index construction are all national data. Milk price and corn price are respectively the monthly average raw milk and corn prices calculated with the weekly or daily prices of ten main milk production provinces that published by China Ministry of Agriculture (CMOA). Soybean meal price is the monthly average price of national spot prices published by CMOA. The imported alfalfa hay price is the monthly average CIF price in RMB that published by China General Administration of Customs.

Moral Hazards and Adverse Selection
We have known that there are foreseeable cyclical and seasonal factors in raw milk price fluctuations in China, which may result in serious moral hazards and adverse selection. Appropriately solve these problems is the greatest challenge of underwriting milk price risks.

Traditional insurance products generally pay for the indemnities based on individual losses. Dairy farmers under insurance protections are likely to relax the management or reduce the input, which may result in production decrease or quality decline. Then the price or margin they receive may be less than the guarantee level, and the claims will happen. And this can be called moral hazard. It's not easy for insurers to recognized and control these risks for sake of information asymmetry. The operating cost will be very high. Taking "price index", on which individual produces can't exert influence, as the basis of measuring losses can effectively reduce the occurrence of moral hazards. But when the program is conducted in small scale, the local operations may still be powerful to affect the whole market. To solve this problem, we can

use data of upper level region or neighbor area in guarantee and actual price index value calculation. For example, the program piloted in Baoding City can use the data of Hebei Province or the neighbor province Shandong or Liaoning. Another measure to cope with moral hazard is to set up rational coverage percentages and let producers take some of the risk by themselves. This is an experience from MPP of United States, in which dairy farmers can choose a fixed coverage percentage of historical productivity and keep at least 10% risks uninsured.

After measurement, we find the milk price index we set also has cyclical and seasonal moving characteristics. When dairy producers can freely decide when to purchase insurance and how much production to cover, the existence of foreseeable factors may give producers chances to purchasing for large amount of milk under low margin expectation, and purchase little in the opposite case. Serious adverse selection may make the insurance program unsustainable. It relies on scientific design of the contract to eliminate adverse selection. Firstly, the coverage period should be long enough. When it is as long as the length of cyclical fluctuation, the former foreseeable periodic and seasonal factors will become insignificant [12]. We divide the calculated milk price index from 2010 to now into three moving cycles. The lengths of them are 33 months, 24months and 8 months. This implies that the cyclical fluctuation frequency is accelerating, and the cycle length is becoming shorter and difficult to foresee. So the cyclical factors are not that important in the scheme design. In consideration of the significant seasonal fluctuation, the coverage period can be set for 12 months. And the indemnity payments are evaluated on a 12-monthly basis. Secondly, there should be a limitation on the production to cover. For purchasing the insurance, the producers should provide real proof of the historical productivity and determine a fixed coverage level, which is a proportion of the whole productivity. For example if the selected coverage level is 90% for an operation whose annual production is 1000 tons, the insured quantity of milk is 900 tons. To avoid the happening of adverse selection, the producers in such price index insurance programs will not be allowed to greatly adjust the coverage level within certain years. For the operations are likely to adjust the size of herds and the yield per cow will increase with improving raising techniques, the program can set a production adjustment mechanism. When the production capacity changes, producers can apply for a new insured quantity with supporting evidence for the new productivity under comparatively constant coverage level.
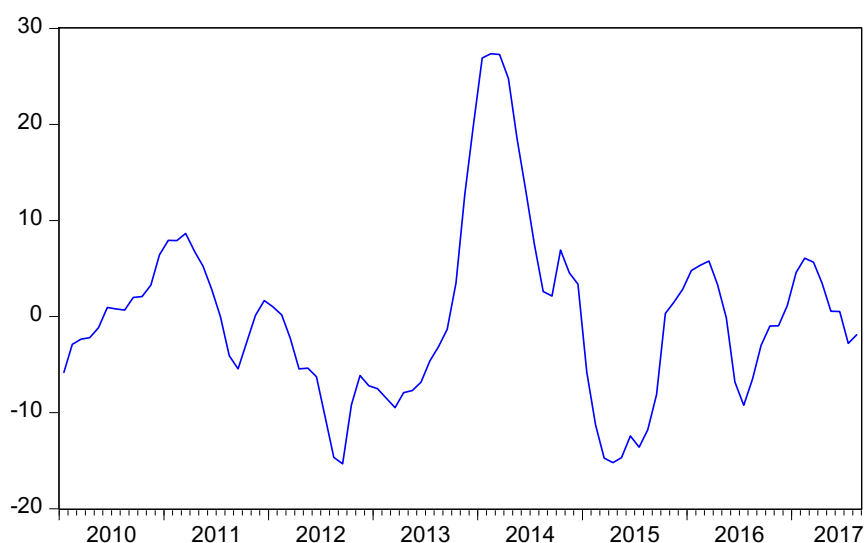

Figure 4. Cyclical Fluctuations of Milk Price Index

Insurance Amount and Premium Calculation

Insurance amount

According to the above settings, the insurance amount of a raw milk price index insurance policy can be calculated using this following formula:

$$InA = PIn \cdot \beta Q$$

InA represents insurance amount of an insurance policy. PIn is the guaranteed price index value written in the contract. β is the coverage level of the total productivity Q.

When the average PIn during the insurance period falls under the guaranteed level, the difference between them will be paid. The indemnity is:

$$Ind = (PIn - APIn) \cdot \beta Q$$

APIn refers to the actual average milk price index during the insured period. The data sources used in the calculation can be selected according to practical needs.

Premium calculation

In general practice, loss distribution is the basis of premium determination. Loss distribution in the future is assumed to be the same as the history, and be used to estimate the future expected losses. The present discounted values of these expected losses are that we call pure premium. But this method requires large amount of historical data, while we can only access useful related data of about 10 years.

The raw milk price index insurance we designed above is actually a kind of Asian options portfolio, which involves a put option of dairy milk and call options of feed. It's very difficult to price for such kind of products, because the prices we use in index construction are average values, which have no closed form distributions, not to mention the sum of them.

In view of the foreign experiences, distribution approximation and Monte Carlo simulations are performed. We here use these method as references to determine the actuarially fair premium for our designed raw milk price index insurance.

Researches by Turnbull and Wakeman (1991) and Levy (1992) show that the use of a lognormal distribution is a good approximation [15]. So, in this study, all the prices in the price index are assumed to follow lognormal distributions, which are defined by reasonable estimations of the means and standard deviations of prices. Then we calculate the premium using a Monte Carlo simulation procedure. Inputs into the simulation are monthly milk, corn, soybean meal and alfalfa hay prices draws. Every set of random "draws" includes 12 groups of monthly prices of milk and the feed. Each group of prices can determine a monthly milk price index. And the average of the 12 index value within one set is one annual simulated index value (ASIV). So the expected loss is the difference between ASIV and guaranteed level when ASIV is smaller, or 0 otherwise. Repeat these procedures for 10000 times, then the average of expected losses can be taken as the pure premium. The calculation steps are as the follows:

$$SPIn(i,m) = P_m(i,m) - 21.46 P_c(i,m) - 6.645 P_s(i,m) - 3.515 P_{alf}(i,m)$$

$$\text{SPIn}(i) = \frac{1}{12} \sum_{m=1}^{12} SPIn(i,m)$$

$$\text{Loss}(i) = \max\left(GPIn - SPIn(i), 0\right)$$

$$\text{Premium} = \frac{1}{10000} \sum_{i=1}^{10000} Loss(i)$$

$SPIn(i,m)$ refers to the simulated price index i for month m. $P_m(i,m)$, $P_c(i,m)$, $P_s(i,m)$ and $P_{alf}(i,m)$ are respectively the simulated per 50kg milk and per kg corn, soybean and imported alfalfa hay prices i for month m. $Loss(i)$ is the simulated indemnity payment in simulation i, and $GPIn$ is the price index guarantee for the insurance period.

According to this method, we take the last milk price fluctuation cycle (from April, 2014) as basis, and take the means and standard deviations of national raw milk price, corn price of main milk production provinces, national soybean meal price and imported CIF alfalfa hay price in this period as parameters to define the lognormal distributions of prices. The actuarially fair premiums we calculate are in Table1.

Table1. Pure Premium and Premium rate of Different Guarantee

Guarantee (RMB)	105	106	107	108	109	110
Premium (RMB)	0.49	0.75	1.11	1.59	2.15	2.76
Premium rate	0.47%	0.70%	1.04%	1.47%	1.97%	2.51%

CONCLUSIONS

On the base of analyzing the fluctuation characteristics of raw milk price in China, we analyzed the feasibility of insuring raw milk price risk. And we designed an insurance scheme from aspects of choice and construction of insurance indicator, moral hazards and adverse selection elimination, calculation of insurance amount and premium. We can get some conclusion from this study.

1) There are trend and cycle, seasonal factors and irregular factors in China raw milk price fluctuations. Trend, cyclical and seasonal movements of the price to some extent are foreseeable for seasoned dairy producers, while the irregular factors caused by unexpected and uncontrollable accidents are difficult to foresee.
2) For the existence of foreseeable factors and systematicness, raw milk price risk is not completely insurable. The impacts of uninsurable factors can be eliminated by technical and institutional innovations, such as government subsidy and scientific scheme design.
3) The selection of insurance indicator is the core of raw milk price index insurance design. Compared with milk price and milk-to-feed price ratio, income over feed cost can better reflect the real profitability of milk production and producers' margin expectation, and is more random.
4) Moral hazards and adverse selection are the most serious challenges we face in the insurance scheme design. The negative impacts can be eliminated by flexible selection of data sources, limiting coverage levels, reasonable insurance period.

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Socio-Economic Status and Life Expectancy in Lebanon: An Empirical Analysis

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ABSTRACT

This study has investigated the impact of socio-economic status on life expectancy in the case of Lebanon over the period of 1971 to 2014. Availability of food, CO2 emissions, secondary school enrollment, per capita income and population growth are used for reviewing socio-economic status of Lebanon. Johansen test is used for examining co-integration among variables. The results of Johansen co-integration show that there is co-integration among the variables of the model. The long run results of the model show that all selected independent variables of the model have significant impact on life expectancy in Lebanon. The causality test results reveal that all the independent variables have causal relationship with life expectancy at birth in the Lebanese case over the selected time period. The estimated results suggest that if government of Lebanon wants to increase life expectancy at birth, it has to improve its socio-economic status of its masses.

INTRODUCTION

At the end of the 20th century, life expectancy at birth got much importance as an indicator of socio-economic development both in developed and developing world. The empirics reveal that much investment in education, health, environment protection, social safety nets and sanitation changed the living standards at world level (UN Development Program, 1997). Rising level of income per capita has started to change the expenditure of developing countries. Now most of the developing countries have good sanitation, literacy rate, nutrition, clean drinking water and decreasing poverty rate which are necessary for long life. But still, there is large number of under-developed countries in Africa where life expectancy has decreasing trends although income per capita and health expenditures are improved as in the case of Sierra Leone where the average life expectancy is 37 year (World Bank, 1997).

Generally, life expectancy is considered a topic of demographic studies but studies of Preston (1975, 1976, 1980), Grosse and Aufiey (1989) and Kakwani (1993) have considered it an important part of development economics. Now there are number of studies that are available which investigate the impact of socio-economic and political factors on life expectancy (Shen and Williamson, 1997; Mahfuz, 2008; Lake and Baum, 2001; Franco et al., 2004; Gerring et al., 2005; Navarro et al., 2006 and Ali and Khalil, 2014. Cumper (1984) and Wolfe (1986) but on the other hand, Poikolainen and Eskola (1988) and Hertz et al., (1994) mention that medical services play an important role in the determination of health status. Lake and Baum (2001) and Navarro et al., (2006) point out that public health expenditures and medical care improve quality of life. Moser et al., (2005) and Vagero (2007) mention that life expectancy show the pattern of growth over the long span of time but variability exist among the world's countries. Normally life expectancy is used for over viewing the living standard and human well-being of a nation, as it is attached with socio-economic development (Lomborg, 2002). From the last few decades, life expectancy has a rising trend in the world and this rise is specifically

witnessed in developed countries. On one side increasing life expectancy is attached with preventative as well as maternal care, better working and living environments, increasing education and per capita income. On the other side, life expectancy provides detail information about environmental quality and health measures of a nation.

Socio-economic changes have very strong impact on life expectancy as depressing per capita income depresses purchasing power of households and it further decrease life expectancy in the long run. As a biological need for human beings, availability of food is essential for human life's span. Forbes and McGregor (1984) mentioned that the relationship between economic growth and mortality rate is very controversial. The results of this study reveal that unemployment being the leading macroeconomic variable, has positive impact on mortality rate in Scotland. This means that rising macroeconomic instability reduces life expectancy.

There are number of policy issues regarding life expectancy which impact fertility, intergenerational transfers, economic growth, social security and human capital investment. One of the main objectives of welfare state is to provide healthy environment, required food to it masses with stable macroeconomic conditions, so the study of life expectancy is very important for governments and policy makers. Since its independence, Lebanon has gone through a number of demographic, social and economic changes. Normally, most of the available policies in previous literature are based on panel or cross country studies. This study is country specific and the target is Lebanon and the examination of the impact of availability of food, CO2 emissions, secondary school enrollment, per capita income and population growth on life expectancy in that country. This type of empirical exercise is hardly done in the case of Lebanon. This study will be a healthy contribution in respective literature and helpful for improving life expectancy and its policy framework.

LITERATURE REVIEW

Grossman (1972) examines the relationship of health and inflation. The results of the study reveal that there is negative relationship between life expectancy and inflation. Moreover, the study concludes that increasing inflation rate put reverse impact on household welfare. Rogers (1979) discusses the relationship between life expectancy and unequal income distribution. The author presents the first conceptual framework for level of income and human mortality rate. Collins and Klein (1980) and Elola et al., (1995) investigate the determinants of health status in case of European countries. These studies conclude that primary health spending has positive and significant impact on health status in Europe. Rogers and Wofford (1989) and Mehfuz (2008) examine the major determinants of life expectancy selected developing countries. The study concludes that level of education, clean drinking water, urbanization, agricultural population, doctors per thousand population and calories intake determine life expectancy in case of developing countries. Davies and Kuhn (1991) describes that availability of food determines the health outcomes. Social security benefits and investment in health sectors reverse the morality rate. Ehrlich and Lui (1991) mention that life expectancy has positive relationship with investment in education. Hitiris and Posnet (1992) and World Bank (1997) mention that health care's spending and per capita income play an important role in deciding life expectancy. Rogot et al., (1992) mention that family income, level of education and employment status of household are main determinants of life expectancy in US. Barro and Sala-i-Martin (1995) explore the relationship between life expectancy and economic growth. The results of the study conclude the positive and significant relationship between economic growth and life expectancy. William and Boehmer (1997) investigate the determinants of female life expectancy. The study reveals that health cares expenditures, gender stratification

and economic development enhance female life expectancy. Zhang et al. (2001) point out that there is inverse relationship between mortality rate and economic growth.

Guralnik et al. (1993) examine the life expectancy difference between white and black communities in the US. The results of the study show that white community has higher life expectancy compared to the black community in US. Nevertheless, increasing level of education converges the life expectancy of black community towards white community. Moreover, public health spending increases the overall life expectancy in US. Anand and Ravallion (1993) explore the relationship among per capita income, health expenditures and life expectancy. They conclude that health expenditures and per capita income have positive and significant relationship with life expectancy. Hill and King (1995) and Gulis (2000) examine the relationship between average years of schooling and health status. The results of these studies revealed that education especially literacy rate of female have positive relationship with life expectancy. Wilkinson (1996) points out that when a country achieved the threshold level of per capita income, the relationship between per capita income and standard of living becomes ambiguous. The study further mentions that increasing per capita income is not necessarily increase life expectancy but there is positive and significant relationship between per capita income and life expectancy.

Sen (1999) examines the determinants of life expectancy in case of Indian State Kerala. The study explores that education affect health status both directly and indirectly. Sen (1999) mention that higher education improves productivity of labor and improved labor productivity has increasing relationship with child's health. Hence education indirectly improves the health status. The findings of this study reveal that education is positively related to life expectancy of female. Cemieux et al., (1999) investigate the relationship of health status and health spending in Canada. The results of the study show that health spending has direct positive and significant relationship health status in Canada.

Kalediene and Petrauskiene (2000) investigate the socio-economic determinants of life expectancy. The results reveal that there is positive and significant relationship between urbanization and life expectancy, the study mentions that urban people are attached with better education and health cares. The study concludes that socio-economic factors have both direct and indirect relationship with life expectancy. Macfarlane et al. (2000) examine the health staus of some selected countries of Africa and Asia. The study shows that availability of food and access to safe drinking water has significant impact on life expectancy both in Asia and Africa. Veugelers et al. (2001) examine the determinants of life expectancy in Canada. For empirical analysis, they use multi-logistic regression analysis. The results of the study reveal that socio-economic factors have deep rooted impact on life expectancy in Canada. Hussain (2002) examine the determinants of life expectancy in 91 developing countries. Fertility rate, per capita calories and adult literacy rate are taken as independent variables and multiple OLS regression analysis is used for empirical estimations. The results of the study reveal that selected variables have deep rooted impact on life expectancy in case of all selected developing countries. Hence for improving the living standard, the developing countries must provide the basic necessities to its massive population.

Ali and Khalil (2014) investigate the impact of food production, school enrollment, inflation, population growth, per capita income and CO2 emissions on life expectancy for Sultanate of Oman. The estimated results reveal that food production and school enrollment has positive and significant relationship with life expectancy for Sultanate of Oman. On the other hand inflation and per capita income has negative but insignificant relationship with life expectancy for the Sultanate of Oman. The results show population growth has negative and significant

relationship with life expectancy of Sultanate of Oman. In the long run CO2 emissions has positive and insignificant relationship with life expectancy but in the short run, it has negative and significant relationship with life expectancy. The findings suggest that government of Sultanate of Oman should seriously check these socio-economic factors for increasing life expectancy.

Ali and Audi (2016) investigate the impact of income inequality, globalization and environmental degradation on life expectancy in Pakistan over period 1980-2015. The results of the study reveal that income inequality and environmental degradation have negative and significant impact on life expectancy in Pakistan. On the other hand globalization has positive and significant impact on life expectancy in Pakistan. The results of Granger causality show that there is unidirectional causality running from all independent variables to dependent variable.

THEORETICAL MODEL AND DATA SOURCES

The objective of this study is to explore the impact of availability of food, CO2 emissions, secondary school enrollment, per capita income and population growth on life expectancy in Lebanon over the period of 1971 to 2014. Data for all the variables is taken from World Development Indicators (WDI) maintained by World Bank. Following the theoretical framework of Grossman (1972), Fayissa and Gutema (2005), Ali and Khalil (2014) and Ali and Audi (2016) the function form of study become as:

$$LIFE = f(FOOD, CO2, SSE, GDPP, POPG) \quad (1)$$

Where
LIFE= life expectancy at birth
FOOD=availability of food (food index)
CO2= CO2 emissions
SSE= education standard (secondary school enrollment)
GDPP= per capita income
POPG= population growth

The econometric functional form of the model become as:

$$LIFEt = \ + \ _1FOODt + \ _2CO2t + \ _3SSEt + \ _4GDPPt + \ _5POPGt + \ _t \qquad (2)$$

Where
T= time period
 = stochastic error term

ECONOMETRIC METHODOLOGY

Time series is indulged with unit root problem and unit root problem make the error of time series nonstationary. Augmented Dickey-Fuller (1981) is used for examining the stationarity of the variables of the model. Johansen (1988) proposed Johansen Co-integration test and Johansen and Juselius (1990) extended it for finding long run relationship of the variables when they are stationary at some order of integration. Originally, the co-integration concept was developed by Engle and Granger (1987). Engle and Granger (1987) proposed a two steps estimation for only one co-integrating vector, but Johansen (1988) and Johansen and Juselius (1990) proposed maximum likelihood test for finding the number of co-integrating vectors in demonstration of Vector Autoregressive (VAR). The common method of VAR is as below:

$$X_t = {}_0 + {}_t X_{t\,1} + \ldots\ldots + {}_k X_{t\,k} + {}_t \qquad (3)$$

Where X_t is a $(n \cdot 1)$ vector of variables that are integrated at same order, ${}_0$ is a $(n \cdot 1)$ vector of constant terms, ${}_t \ldots\ldots {}_{t\,k}$ are parameters and ${}_t$ is the residual term, for Vector Error Correction Model (VECM) the VAR can be written in following form.

$$X_t = + \sum_{i=0}^{1} {}_i \, X_{t\,i} + X_{t\,1} + {}_t \qquad (4)$$

Where X_t is a $(n \cdot 1)$ column vector of variables, u is a $(n \cdot 1)$ vector of constant terms, ${}_t$ is $(n \cdot 1)$ vector of usual error term, $\triangle$ is difference operator and as well as represent coefficient matrices. The coefficient matrix is representing the long run equilibrium relationship for the matrix. In this analysis two types of likelihood ratio tests are utilized (trace test statistics and maximum eigenvalue test statistics) for finding co-integrating vectors. VAR Granger Causality/Block Exogeneity Wald test is used for finding causal relationship among variables. This is going to test the causal relationship among life expectancy, availability of food, CO2 emissions, secondary school enrollment, per capita income and population growth.

EMPIRICAL RESULTS AND DISCUSSION

Augmented Dickey-Fuller unit root test results are presented in table-1. The results of ADF test show that life expectancy at birth, availability of food, CO2 emissions, secondary school enrollment, GDP per capita and population growth are not stationary at level. But all the selected variables of the model are stationary at first difference. So having the same order of integration among the variables of the model, the best method of co-integration is Johansen co-integration.

Table 1: Augmented Dickey-Fuller (ADF) Test for Unit Root

Augmented Dickey-Fuller (ADF) Test at Level		
Variables	**t –Statistic**	**p- Value**
LIFE	0.717956	0.9910
FOOD	-1.315286	0.6140
CO2	-0.991389	0.7480
SSE	1.970863	0.2981
GDPP	0.049335	0.9577
POPG	-1.091098	0.1349

Augmented Dickey-Fuller (ADF) Test at 1st Difference		
Variables	**t –Statistic**	**p- Value**
LIFE	-2.669221	0.0887
FOOD	6.995631	0.0000
CO2	5.846525	0.0000
SSE	-5.680238	0.0000
GDPP	-4.239947	0.0017
POPG	-3.877576	0.0048

Table 2 presents the results of lag length criterions. Generally, sequential modified LR test statistic (LR), Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) are used for this

purpose. So following the above lag length criterions maximum 2 lag length is selected for long run empirical analysis.

Table 2: VAR Lag Order Selection Criteria

Endogenous variables: LIFE FOOD SSE CO2 GDPP PPOGR						
Sample: 1971 2014						
Included observations: 42						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1186.460	NA	1.85e+17	56.78380	57.03204	56.87479
1	-833.2204	588.7324	5.17e+10	41.67716	43.41483	42.31409
2	-726.0485	147.9994*	1.94e+09*	38.28802*	41.51512*	39.47088*
* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error AIC: Akaike information criterion SC: Schwarz information criterion HQ: Hannan-Quinn information criterion						

Table 3 presents the results of Johansen's co-integration test. Maximum Eigen statistics and Trace statistics are used for determining the co-integration among the variables of the model. This study has investigated the socio-economic status on life expectancy in Lebanon over the period of 1971 to 2014. The estimated trace statistics is greater than the critical value till R ≤ 2 hence it rejects the null hypothesis of no co-integration. The results show that there is 2 co-integrating relationship among the variables of the model. In the case of Maximum Eigen test statistic, the value of Max-Eigen is greater than critical value till R ≤ 1*. So Max-Eigen value also confirms the existence of one co-integrating relationship among the variables of the model. On the bases of Trace statistic and Max-Eigen statistic it is concluded that there is co-integration among the model's variables.

Table 3: Unrestricted Co-integration Rank Test (Trace)

H_0	H_1	Trace Statistic	0.10 Critical Value	Prob.[a]
R = 0*	R ≥ 1	176.1770	95.75366	0.0000
R ≤ 1*	R ≥ 2	82.58159	69.81889	0.0034
R ≤ 2*	R ≥ 3	50.73500	47.85613	0.0262
R ≤ 3	R ≥ 4	30.17108	29.79707	0.0453
R ≤ 4	R ≥ 5	13.16475	15.49471	0.1089

Unrestricted Co-integration Rank Test (Max-Eigen)

H_0	H_1	Max-Eigen Statistic	0.10 Critical Value	Prob.[a]
R = 0*	R ≥ 1	93.59537	40.07757	0.0000
R ≤ 1*	R ≥ 2	33.84659	31.87687	0.0857
R ≤ 2	R ≥ 3	20.56392	27.58434	0.3034
R ≤ 3	R ≥ 4	17.00633	21.13162	0.1717
R ≤ 4	R ≥ 5	13.10936	14.26460	0.0755

[a]MacKinnon-Haug-Michelis (1999) p-values
* denotes rejection of the hypothesis at the 0.1 level

The long run relationship model results are presented in table 4. The estimated results show that food availability has positive and significant relationship with life expectancy at birth in Lebanon. The results show that a 1% increase in availability of food increases life expectancy at

birth 0.056465%. These results support the results of Ali and Khalil (2014) and Ali and Audi (2016). The coefficient of CO2 emissions shows the negative and significant relationship with life expectancy at birth in case of Lebanon. A 1% increase in CO2 emissions causes to decrease 1.072773% in life expectancy at birth. These results support the study of Ali and Audi (2016) but contradict to Ali and Ahmad (2016). There is positive and significant impact of secondary school enrollment on life expectancy in Lebanon. The results reveal that 1% increase in secondary school enrollment brings 2.38E-O5% positive change in life expectancy at birth in case in Lebanon. These results favor Ali and Ahmad (2014) and Ali and Audi (2016) where these studies claim that level of education play an important role for life longevity. The results show that there is positive and significant relationship between GDP per capita and life expectancy in Lebanon and 1% change increase in GDP per capita brings 0.001062% increase in life expectancy at birth. Population growth positively impacts life expectancy at birth and has significant effect in Lebanon. The life expectancy at birth increases 0.285793% with a 1% increase in population growth. Over the selected time period, the model's overall results in the long run shows that availability of food, CO2 emissions, secondary school enrollment, GDP per capita and population growth have significant relationship with life expectancy in Lebanon. The results of the model show that by improving socio-economic status in Lebanon life expectancy at birth is further enhanced.

Table 4: Long Run Relationship

Dependent Variable: LIFE			
Variable	Coefficient	t-Statistic	p-Value
FOOD	0.056465	4.837052	0.0000
CO2	-1.072773	-3.263978	0.0024
SSE	2.38E-05	4.3338	0.0169
GDPP	0.001062	10.40936	0.0000
POPG	0.285793	2.517440	0.0163

The short run estimated results, have been shown in table 5. In the short run, availability of food has positive and significant effect on life expectancy at birth in Lebanon. CO2 emissions and population growth has negative and significant short run impact on life expectancy at birth in Lebanon. The results reveal that secondary school enrollment and per capita income has negative and insignificant impact on life expectancy at birth and this short run relationship is opposite to long run relationship. The overall results reveal that life expectancy at birth is a long run phenomenon in Lebanon rather than short run. The ECM value is negative and significant which is theoretically correct and shows speed of convergence from short run time period to long run time period. The estimated value of ECM show 0.0043 percent short run deviation is corrected in long run.

Table 5: Short Run Estimates

Dependent Variable = DLIFE			
Variable	Coefficient	t-Statistic	p-Value
DFOOD	1.650084	31.98166	0.0000
DCO2	-0.781526	-18.21171	0.0000
DSSE	4.52E-06	0.051877	0.9590
DGDPP	-0.000112	-1.041380	0.3069
DPOPG	-1.47E-07	-4.292610	0.0002
ECT	-0.004396	-7.140292	0.0000

R-squared 0.999671	Mean dependent var 0.306534
Adjusted R-squared 0.999513	S.D. dependent var 0.121664
S.E. of regression 0.002686	Akaike info criterion -8.736501
Sum squared resid 0.000195	Schwarz criterion -8.151379
Log likelihood 193.0983	Hannan-Quinn criter. -8.523432
F-statistic 6311.875	Durbin-Watson stat 1.929715

The estimated results of VAR Granger Causality/Block Exogeneity Wald Tests are presented in the table 6. The results show that there is bidirectional causality running between life expectancy at birth and availability of food in Lebanon. There is unidirectional causality is running from CO_2 emissions to life expectancy at birth in Lebanon over the selected time period. The results reveal that unidirectional causality is running from secondary school enrollment to life expectancy at birth in case of Lebanon. There exists bidirectional causality is running between per capita income and life expectancy at birth in Lebanon. There is no causal relationship between population growth and life expectancy at birth over the selected time period. There is a unidirectional causality running between availability of food and CO_2 emissions. There is bidirectional causality is running between availability of food and per income in Lebanon. There is no causal relationship between secondary school enrollment and between population growth and availability of food in Lebanon over the selected time period. The results reveal a unidirectional causality between secondary school enrollment and CO_2 emissions in Lebanon. The result show a bidirectional causality running between per capita and CO_2 emissions and between population growth and CO_2 emissions in Lebanon. There is no causal relationship among secondary school enrollment, per capita and population growth in case of Lebanon over the selected time period. These findings have proposed that the Lebanese government of Lebanon should improve socio-economic status for improving life expectancy at birth.

Table 6: VAR Granger Causality/Block Exogeneity Wald Tests

Sample: 1971 2014			
Included observations: 42			
Dependent variable: LIFE			
Excluded	Chi-sq	Df	Prob.
FOOD	27.16451	2	0.0000
CO2	27.00663	2	0.0000
SSE	9.062265	2	0.0108
GDPP	10.89355	2	0.0043
PPOGR	0.134806	2	0.9348
All	141.9768	10	0.0000
Dependent variable: FOOD			
Excluded	Chi-sq	Df	Prob.
LIFE	9.932106	2	0.0070
CO2	3.773871	2	0.1515
SSE	1.294614	2	0.5235
GDPP	11.65383	2	0.0029
PPOGR	0.258808	2	0.8786
All	16.33016	10	0.0906
Dependent variable: CO2			
Excluded	Chi-sq	Df	Prob.
LIFE	4.387384	2	0.1115
FOOD	16.29946	2	0.0003
SSE	10.15484	2	0.0062
GDPP	8.182654	2	0.0167
PPOGR	7.634916	2	0.0220
All	42.45152	10	0.0000
Dependent variable: SSE			
Excluded	Chi-sq	Df	Prob.
LIFE	3.263201	2	0.1956
FOOD	1.790704	2	0.4085
CO2	2.229016	2	0.3281
GDPP	0.042891	2	0.9788
PPOGR	4.244763	2	0.1197
All	21.72663	10	0.0166
Dependent variable: GDPP			
Excluded	Chi-sq	Df	Prob.
LIFE	5.974904	2	0.0504
FOOD	6.176976	2	0.0456
CO2	9.606328	2	0.0082
SSE	2.898693	2	0.2347
PPOGR	2.928848	2	0.2312
All	36.40698	10	0.0001
Dependent variable: PPOGR			
Excluded	Chi-sq	Df	Prob.
LIFE	3.271608	2	0.1948
FOOD	2.679808	2	0.2619
CO2	7.000563	2	0.0302
SSE	0.948539	2	0.6223
GDPP	0.158611	2	0.9238
All	17.51806	10	0.0637

CONCLUSIONS AND POLICY SUGGESTIONS

This study has examined the impact of socio-economic status on life expectancy in Lebanon over the period of 1971 to 2014. Life expectancy at birth is taken as dependent variable whereas for socio-economic status, availability of food, CO2 emissions, secondary school enrollment, per capita income and population growth are taken as independent variables. Augmented Dickey-Fuller unit root test is used for reviewing stationarity of variables of the model. Johansen co-integration is used for examining the co-integration among the variables of the model. VAR Granger Causality/Block Exogeneity Wald Tests are used for examining the causal relationship among the variables of the model. ADF unit root test results show that all the variables of the model are stationary at first difference. The results of Johansen co-integration show that there is co-integration among the variables of the model. The model's long run results of the model show that all selected independent variables of the model have significant impact on life expectancy in Lebanon. The causality test results reveal that all the independent variables over the selected time period have causal relationship with life expectancy at birth in Lebanon. The estimated results suggest that if the Lebanese government wants to increase life expectancy at birth, it has to improve the socio-economic status of its masses.

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Strike Deadlines: Of What Use Are They?

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ABSTRACT
This article is intended to be an advocacy paper against setting of strike deadlines before embarking on strikes. In public sector for example, unions have realized that the only language government understands is strike, and when union gives deadlines, government barely takes action to call union to the negotiation table. Rather it embarks on campaign of calumny, which is a way of beating about the bush. This paper illustrates that despite strike deadlines, strikes still occur. This shows that some strikes are unavoidable. This paper gives reasons making some strikes unavoidable despite the huge cost of strikes and the warning given through the deadlines.

Key words: Strike, deadlines, use

INTRODUCTION
Strike deadlines are generally perceived as an opportunity to do whatever is necessary to avoid strikes, since strikes are considered to be very costly both to labour and management. However, some union leaders consider strikes as a proving ground to show that unions not only bark but are capable of biting. It is used to support the saying that all work and no play makes jack a dull boy. Strikes are also considered as a way for labour, for once to call the shot rather than management to always issue instructions which labour is bound to obey. It is an occasion for union members to show solidarity. Surprisingly, management may incite strike to present an occasion to sell its unsold goods stockpiled in the warehouse. In the event that a strike is perceived as an opportunity to have one's way, a strike deadline serves no useful purpose in averting it.

What is a strike?
A strike has been defined as "a temporary stoppage of work by a group of employees in order to express a grievance or enforce a demand." This definition was expatiated upon, to the effect that the temporary nature of strikes suggests that at its conclusion the strikers should return to the same jobs with the same employer, who himself normally views a stoppage in the same terms.

A strike is a collective act, undertaken by a group of employees. The fact that the group involved in the act is of employees is also crucial. Refusal by students to attend lectures is called a strike only by analogy. A strike is almost always a calculative act, designed 'to express a grievance or enforce a demand (Griffin, 1939:20-2) Hyman (1971: 17)

Varieties of Strikes
Broadly speaking, there are general strikes, political strikes, and strikes limited to a company or an industry. A general strike is that undertaken by nearly all sectors of the economy. Unlike strikes limited to a company or industry it is directed to the government or the state to express grievance or enforce a demand. A political strike has been referred to as illegitimate use of industrial muscle aimed at destroying a government by precipitating a revolution.

In strikes limited to a company or an industry, we could distinguish an avoidable strike, an unavoidable strike, official strike, an unofficial strike, a constitutional strike and an unconstitutional strike. An avoidable strike is that given the circumstances of the issue at stake could have been avoided within the time- frame of the strike deadline.

Here the true positions of the parties overlap, so that an omniscient observer could prescribe a solution acceptable to both. An unavoidable strike is that in which the final positions of the parties fail to overlap, so that each prefers a shutdown to further concessions.

An unconstitutional strike is initiated in contravention of a status-quo clause in most grievance/dispute procedures stating that industrial action, by either party, should not be undertaken until all the stages of the procedure have been exhausted. An unconstitutional strike breaches the jointly agreed and established procedure for resolving differences between management and employees; acceptance of the use of unconstitutional strike may be tantamount to repudiation of the regulatory framework itself. Arising from the above definitions, it could be safely stated that a constitutional strike follows constitutionally laid down procedure for embarking on a strike, while an official strike is that which receives the blessing of union leaders.

A strike is part of a generic concept referred to as industrial conflict. Industrial conflict has been defined by various authors and one that seems to be popular is that proffered by Kornhauser, Dubin and Ross (1954). They describe Industrial conflict as "total range of behavior and attitudes that express opposition and divergent orientations between individual owners and managers on the one hand, and working people and their organizations on the other" (p.13).

Hyman (1971:53) cited Clark Kerr (1964) who described industrial conflict to be of various forms which include peaceful bargaining and grievance handling, boycotts, political action, restriction of output, sabotage, absenteeism, personnel turnover, insubordination and physical attack, overtime bans and strikes. Several of these forms, such as sabotage, restriction of output, absenteeism and turnover may take place on an individual as well as on an organized basis and constitute alternatives to collective action. Hyman also pointed out that the various forms of conflict are alternatives and that in an industrial situation in which workers experience sufficiently acute deprivations, unrest will be expressed in some form. The circumstances of the case will however influence what form this expression of conflict takes. Thus, in any situation the different varieties of industrial conflict may represent alternatives. Hyman (1971:55) recalled the observation made in Sayles (1958:8) to the effect that there was evidence of worker discontent, but often it was not found in terms of specific demands or grievances – he then suggested that attempts to suppress specific manifestations of conflict, without removing the underlying causes of unrest may merely divert the conflict into other forms.

Strike deadlines

A strike deadline is an outcome of negotiation indicating that an impasse has been hit and a period of grace is given to management to reconsider her stand to improve the status quo, failure of which would leave labour with no other option than a strike. Succintly put, it is the date at which a collective bargaining contract expires and a strike can start if a settlement is not reached. An impasse is the point in negotiations where no compromise appears achievable and a strike or lockout is imminent. Reynolds (1949:184) pointed out that it has been said that:

"war is a continuation of diplomacy by other methods." Similarly, A strike is a continuation: of bargaining by other methods and it is an intrinsic part of the bargaining process.

Ross (1988) pursued this argument further by averring that deadlines can motivate progress in negotiation and without a deadline, negotiators may be tempted to use stalling strategies with the goal of convincing their counterpart to make more concessions. As Pfeffer (1992) observed "Deadlines are an excellent way of getting things accomplished. They convey a sense of urgency and importance and provide a useful countermeasure to the strategy of interminable delay."

The Right to Strike

Johnston (1981: 136) cited Crofter Harris Tweed v. Veitch in which Lord Wright pronounced in 1942 that "the right of workmen to strike is an essential element in the principle of collective bargaining" Fleming (1965:203) in Johnston (1981: 136) an American authority writes about strikes as follows:

"But a strike is more than a test of strength over a particular issue. It is also a release from the humdrum existence of everyday industrial life, a proving ground for union leaders, a moment of excitement, glory and perhaps disillusionment in a battle against an opponent who usually holds the upper hand, a sharing of hardship which may weld the union together, and a high-level poker game at which plays and counter plays are expressed."

The possibility of a strike, which both sides are usually anxious to avoid, leads them to make concessions and seek agreement. If negotiations break down and a strike occurs, this exerts continuing pressure on both sides to reach a settlement….Without the possibility of a strike in the background, there is no reason why an employer should make any concession whatever to a union. Yet disputes between unions and management would still have to be settled somehow. The only possible way of settling them with strikes eliminated is through compulsory arbitration by a government agency (Reynolds, 1949). Reynolds pointed out that while the "right to strike is often confused with the right of a worker to quit his job, the two things are quite different. A worker quits his job when he wishes permanently to sever his connection with the employer. It is possible for this concerted activity to be unlawful even though each worker as an individual has the right to stop work whenever he wants to."

Management Consideration before the Expiration of Strike Deadline

Once a strike deadline has been hit, management is no longer at ease, it works round the clock either to stall the strike or call the union's bluff. Management considers its prerogatives as inviolable, hence management cannot but take a strike if any union demand impinges on such prerogatives. Also, if the union's minimum wage demand is above management's maximum it is likely that management will call the union's bluff. Many companies see trade unions as voluntary organizations hence any agreement forcing workers to be members of a union is not honoured as a result of management policy. In addition, consideration is given to short and long term implications of settling without a strike. Management also considers the cost of strike which involves possible loss of profits, customers, suppliers. It also involves deterioration of machinery resulting from being left idle and also possible damage to company property by strikers. Public visibility of strikes particularly in a case of essential services is also of grave concern. (Otobo, 2000)

Otobo (2000:276) reported various factors considered before a union decides to go on strike, bearing in mind the commonplace belief of not threatening strike unless you are ready for it.

Union Consideration

What effect will calling a strike or, conversely, agreeing on a contract without a strike, have on the union's policies, aims and goal? These policies and goals are held to be of the greatest importance and, if necessary, are defended at the cost of a strike. Basic policies are set forth in the union's constitution and in convention resolutions.

What are the long-term and short-term implications of settling without a strike? This is closely related to the first consideration mentioned, but in addition, involves the effect of a settlement upon the internal or external strength of the union, upon the wants and attitudes of its members, and upon its reputation in the community and with other unions.

What is the strength of the union and its ability to shut down the company's operations? This includes whether all or most of the members of the union can be persuaded to stay off the job, whether non-members can be encouraged to do the same, and whether other unions will co-operate with striking union.

To what extent will the striking members be able to withstand the loss of salaries? Will they be able to secure work elsewhere? To what extent will the union itself be able to provide strike benefits to its members? In addition to the financial aspect, union leaders try to evaluate the amount of moral support for the strike they can expect from both strikers and their families. Do they attach importance to the issues at stake?

To what extent will public opinion be sympathetic – or at least, not antagonistic- to the purposes of the strike? What role will government be expected to take in the event of a strike? In the case of major work stoppages and those immediately and directly affecting the community welfare (such as hospital strikes), will there be governmental interference in the form of fact-finding boards, attempts At mediation or conciliation and the like? Which government laws or legislation restrict the conduct of strikes?

Settlement of Disputes Without Strikes

Just as police stations are set up in the larger society to arrest aberrant behaviours so the state has set up parliamentary bodies to institutionalize conflict among which is the strike. The one specifically used to arrest strike is compulsory arbitration. Much controversy surrounds the use of compulsory arbitration. When used, the state justifies its use by what they refer to as 'threat to public interest' in the sense that development plans could be disrupted and or the general public could be denied of the utilities classified as essential services.

Fanciful Reasons Making strikes Desirable In the Face of Deadlines

Despite strike deadlines different fanciful reasons have been adduced for the desirability of strikes. An employer may regard a strike as a good way of breaking a weak union and freeing himself from the necessity of collective bargaining. On the other side a radical union leader may regard a strike as desirable to build up revolutionary fervor and hatred of "the capitalists", even when there is no chance that strike will win any immediate benefits. Second, a strike may occur because of inability of the parties to compromise their positions. Third, even where compromise is possible, one side may be willing to compromise because it has a low opinion of the others strength and thinks it can win its point easily and quickly.

Another reason as contained in (Hicks 1932:146) is that "weapons grow rusty and a union which never strikes may lose the ability to organize a formidable strike, so that its threats become less effective." Also Hyman (1971:35) quoting (Turner et al., 1967:331) "the frequency

with which managements themselves lay men off… makes it seem nothing abnormal for workers to withhold their labour'. Hyman (1971:36) continued in that argument and inferred that a stoppage, then, may not be unwelcome in all situations. It has been argued that the Post Office made a profit out of the 1971 dispute: the strike closed down the letter and parcel service, which had been running at a loss, but there was a large increase in use of the profitable telephone service (Foot, 1971:15). The cynic might suspect that in some circumstances a strike could even be provoked – when an employer is faced by production difficulties or dwindling order books.

Reynolds (1949:185), believed that in order to discover the "causes" of strikes, despite deadlines it is necessary to find out the circumstances in which agreements between the parties become impossible. The following are some of the circumstances according to him

One of the Parties Wants a Strike
When an employer feels a strike would occasion a break from a weak union thus freeing himself from the necessity of collective bargaining. On the other hand, a radical union leader may consider a strike desirable to build workers' fervor/solidarity.

Inability of Both Sides to Compromise
A union may insist on a wage higher than the company can pay. A union leader may realize that their demands are impossible but to retreat would jeopardize their own positions and perhaps split the union.

Negotiators are Not Free Agents
Negotiators are not free agents: they derive authority and ratification from their principals hence there is a limit to how far they can go or what decisions they can make at the bargaining table. Another factor is membership pressure which may force union negotiators to maintain a position which they know the company may not accept.

Misconception of The Intention of the Opposing Sides
This is exemplified by calling a bluff which turns ou not to be a bluff after all. The employer can cause a strike by doing nothing; the union then has to take the positive step of calling out the workers. This would force the employer to the negotiation table –A strike is the continuation of bargaining by other methods. It is a route to agreement. Reynolds (1949: 185)

Herman et al. (1992:) believed that at the back of negotiators' minds are the following questions and answers to them could precipitate strike. "could the union shut down the plant completely by a strike, and if so for how long? How much would this cost the company and how much would it cost the union? Which is in the better position to take such a loss, and which would probably crack first?

Salamon (1992:77) cited a suggestion made by Blackburn (1967) to the effect that a trade union must be prepared to be militant – use industrial action. This is in line with an affirmation that trade unionism is a fighting movement and that movement implies a common end or at least a community of purpose which is real and influences men's thoughts and actions. A trade union must not get into such peaceable habit. It must have teeth to bite and be ready to fight.

CONCLUSION
Considering the high cost of strikes to both management and labour, one would think that a strike deadline should be an opportunity to avert a strike. However, looking at the situation from different perspectives, some strikes are considered desirable and in such a situation, no

amount of strike deadlines can avert such strikes. A panorama of strikes in Nigeria from 1945 General Strike up to the recent 2013 General Strike occasioned by hike in fuel price reveals that despite strike deadlines given, strikes still occur. Even with ban on strikes or no work no pay threats, this was not sufficient to avert strikes. In the public sector, when collective bargaining is adopted, government does not show commitment. For instance in 2017 Academic Staff Union of Universities (ASUU) strike, the Minister of Education, Adamu Adamu said that late last year ASUU gave one week notice of strike and government and Asuu were able to work out an agreement. However, government has not fulfilled its part of the bargain. Hence the minister admitted that government failed ASUU. Guardian (2017, August 17).   More importantly, a situation where either the management or the union desires a strike, a strike deadline is of no use! There have occurred series of strikes despite the deadlines given. To mention just a few , is the Birmingham bin strike reported on 13 September 2017; London tube strike reported on29 September 2017 which was reported would hit commuters and football fans next week; Rail strike set to disrupt services across England was reported on4 October 2017 all reported in Industrial action UK-news

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Managing with or Without Unions: A Matter of the Frame of Reference

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ABSTRACT
It is possible to manage with or without unions depending on the frame of reference that management embraces. However, there are advantages and disadvantages to whichever frame of reference a management chooses. Managing without unions is like a government without opposition. It is unitary; it is autocratic in its worst, paternalistic at its best. Managing with unions is pluralistic and requires a process of accommodating various stakeholders.

Key words: manage with, manage without, unions, matter of frame of reference, unitary, pluralistic

INTRODUCTION

As a result of the industrial revolution which started in Britain in the C17th, many changes were brought about. Technology changed, manufacturing processes changed, mass production was possible and profits increased. Manufacturers became enormously wealthy but the lot of workers was not improved. Capitalists were driven to make more and more profits at the expense of workers. The immediate effect of industrialization upon workers was that they were drawn together in large numbers and at the same time in considerable distance from their employers. This process of alienation was further compounded by the fact legal contrivance making fund available for the requirement of production made numerous people to be co-owners of a company. Division of labour dispenses with the need to have relatively expensive skilled labour. Jobs became so simple that workers could be brought straight from the street to start work on a production line. The jobs became repetitive and boring. To ensure work was done properly, close supervision became the rule and work was dehumanized as a result. To make optimum use of the expensive machinery, it was injudicious to leave them idle for a long time hence shift work became desirable and some workers became nocturnal against their wishes. Under this system the workers totally depended upon wages and referred to industrial capitalism as 'wage slavery'. Trade unions as we know them today evolved gradually as a permanent opposition in industry. It will be seen that they have come to work within the system, to change the relationships originally imposed or threatened. (Whitehead, 1977)

Hyman (1981) in his introduction comments that social relationships are essentially dynamic; what exists at any point in time is the product of past actions and relationships and contains in turn the potential for future development. To do justice to this dynamic character, any valid social analysis must contain a historical dimension. The foregoing introduction is the historical dimension.

RATIONALE FOR TRADE UNIONISM

There is a limit to individual action of the worker. Workers avail themselves the opportunity of equalizing their feeble power with the 'almighty' power of the employer, by forming a union, speak with one voice with collective will knowing the employer can do away with an individual worker but it would be foolhardy to attempt to do away with the entire workforce. This is

summed up in the dictum 'In unity there is strength'. The benefit to the individual workers is that, through the union to which they belong they participate in making decisions affecting them in their organization. Management on the other hand saves time and effort in dealing with individual worker.

Clegg (1951, p.76) in his defence of trade unions' limited democracy points out that the primary task of a union is to protect its members and to protect them against someone – the employer. The trade union is thus industry's opposition – an opposition which can never become a government.

There is need for an opposition in industry. Not only would industry be autocratic without it …. The main activities of the union can well be interpreted as opposition, as opposition to the wage the employer pays, the conditions of the establishment, the way he and his agents treat his men, in the endeavour to obtain improvements. And the union has incentive to oppose, discover, if possible, the shortcomings of the employer. For if employers had no shortcomings there would be no need for trade unions – as we know them.

Trade Unions As Seen by Scholars/Writers
The approach of the employer or the manager to industrial democracy is radically different …. He may have genuine interest in the welfare of his staff and be convinced that the best work arises from willing cooperation, and yet strive to exclude trade unions as outsiders who have no claim to interfere in its establishment, and set up welfare schemes, internal representative organizations or co-partnership schemes to achieve his purposes and to avoid the need for unions …. The 'progressive' employer welcomes trade unions, encourages his workers to join them, perhaps grants them the security of a closed shop, takes pains to keep on good terms with the union officials, pays a full-time elected secretary of the workers' side of the works council to devote his time to looking after the interests of the workers; and the reason for it is that he feels that willing cooperation can only arise out of independence. The trade union may be allowed to oppose him and to protect the worker, because the employer thinks that union opposition may be led to play its part in achieving genuine cooperation Clegg (1951, p82).

Flanders (1970, p20) claims that trade unions exist to promote sectional interests – the interests of the section of the population they happen to organize….There is nothing selfish or slightly disreputable about this; it is an essential part of the democratic process….The activity to which they devote most of their resources and appear to rate most highly is collective bargaining. So the question we have to ask is what purposes do unions pursue in collective bargaining? He goes further to say that, one of the principal purposes of trade unions in collective bargasining is regulation and control because unions and their members are interested in the effect of the rules made by collective bargaining, which is to limit the power and authority of employers and to lessen the dependence of employees on market fluctuations and the arbitrary will of management.

Cole (1913, p73) regarded trade unions as co-partners of industry, when he suggested that in studying the future of trade unionism, we shall be regarding it as the future partner of the State in the control of industry – no longer as a mere fighting organization, existing only because the employer is there to combat, but as a self-governing, independent corporation with functions of its own- the successor of capitalism as well as its destroyer.

Of the section of the population they happen to organize....The activity to which they devote most of their resources and appear to rate most highly is collective bargaining. So the question we have to ask is what purposes do unions pursue in collective bargaining?

Two Views of Trade Unionism
Cole (1939, pp. 535-6) affirms that there are two views of the purpose of trade union even within the Trade Union movement. Class-conscious proletarians, holding Socialist (or in some countries Anarchist or Syndicalist) opinions, and seeking to weld the whole working class together into a solid force for the overthrow of capitalism, regards the trade unions as the instinctive expression of the class struggle which is inherent in the wage relationship between capitalist and labour, and can be transcended only by the supersession of capitalism itself. Another view of trade unionism is held among the skilled workers and among professional and other non-manual workers who enjoy the superiority of status or income. This view is to the effect that a trade union exists to protect and advance the interests of a defined group of workers who possess some special skill or other mark of distinction from the general mass of labour, so that they can hope to secure better terms of employment than would be possible if each man acted alone by creating a limited monopoly of labour in order to improve its price. Here there is no desire to change the economic system nor is there any desire to build up a solid combination of the whole working class.

Otobo (2000) splits the former view into two, explaining that it depends on whether or not the action is contemplated under capitalist or socialist regime. Under a capitalist regime, apart from improving the lot of labour, it is duty of the revolutionary trade union to unite, discipline and educate the masses with a view to abolishing capitalism and establishing socialism. Under the socialist regime, the trade union should consolidate the gains of the revolution. The latter view is the western or capitalist view and this is not materially different from that of Cole. Here trade union works within capitalism and strives to improve the working lives of their members.

MANAGING WITH UNIONS
Managing with unions requires management to make certain decisions in conjunction with union. There are some decisions which management considers its prerogatives. Under the mechanism known as collective bargaining, decisions on divergent issues are made. Such decisions are codified in collective agreement. Under joint consultation decisions on issues of mutual interests are made. These decisions are joint understandings short of signed agreement. Management initiates the implementation of collective agreement and the union monitors the implementation to ensure the agreement is followed to the letter.

MANAGING WITHOUT UNIONS
Through the union, the interest of the members are defended and protected but without a union, there is no guarantee, that management will be fair, that workers will not be short-changed. IBM, Hewlett Packard and other large multinationals such as Black and Decker, Gillette, Mars, Polaroid, Texas Instruments, Nestle, Marks & Spencer are non-union companies. Managing without unions is autocratic, unilateral and the temporary benefits workers may enjoy, cannot be guaranteed in future. Management may start well i.e. being fair but the vagaries of the economy may compel it to discontinue being fair to its employees. A case in point is Marks & Spencer-manufacturer without factories. As culled from Blyton and Turnbull, (1998, pp.245-50)

> *'Do as you would be done by' (Sieff, 1990;84) is the golden rule of the company's human relations policy. As the former Chairman Lord Sieff explained, any policy derived from the 'law and the prophets' carries with it a strong moral obligation. Good human*

relations at work pay off; they are of great importance if a business is to be efficiently run' (ibid:56). This is certainly true of Marks & Spencer, a company hailed by Peter Drucker (1974:98) as one of the most efficient in the world, and a few years ago voted Britain's best managed company for the third year in succession by a panel of institutional investors, captains of industry and business journalists (Financial Times, 19 March 1997). It is on record that since the late 1960s Marks and Spencer's approach to human relations has been popularized as an alternative to the collectivist, institutionalized approach based on the Whitley and later Donovan model, as Lord Sieff (1986:82) points out in his memoirs. He states that when employees are recruited to Marks and Spencer they are given a 'Welcome Pack' containing information on the company and its principles. It is here they first encounter the company's commitment to fostering good human relations. A second booklet, "Facts for New Staff' gives details of employees' conditions of employment. These include competitive rates of pay, non-contributory pensions, profit sharing and extensive medical care. Female employees, for example, are offered breast and cervical screening, while male employees can view a video and read a company leaflet on testicular self examination. Everyday health and safety is covered in another booklet, 'The Right Move' which advises on such matters as the lifting of heavy boxes), while "Personal Safety' offers employees advice on going to and from work.

Tse (1985:118) argues that it is a misrepresentation to simply label Marks & Spencer's approach to human relations as paternalism. Tse goes further to remark that the company's human relations policy includes respect for the individual, attention to the problems of individuals at work, full and frank communications, the recognition of people's effort and contribution, and continuous training and development. Tse (1985:122) goes further to say that as trade unions are concerned Marks & Spencer's approach can best be described as 'pre-emptive', straightforwardly non-union rather than explicitly anti-union. Put differently, the approach is one of substitution rather than suppression of union activity (Beaumont, 1987:130) adds, Marks &Spencer's Director of Personnel remarks that the company appreciates that in companies that are willing or unable to provide more than the basic terms and conditions for their employees trade unions do have a valuable role to play in negotiating for their members and Tse punctuates that with such care and attention lavished on the promotion of good human relations, 'unionism simply finds it difficult to flourish in St Michael Soil'

The policy as pictured above lasted till 1991 when in contrast to its human relations policy Marks and Spencer announced 850 redundancies, which in some quarters was seen to herald 'the end of Marks & Spencer's unofficial commitment to its staff of a job for life' As Lord Sieff (1990:64-5) makes it clear, any such commitment on the part of M&S was always implicit rather than explicit, but the effect on the staff concerned was nonetheless traumatic.

Financial Times (30 April 1991) wrote 'The Baker Street headquarters in London was gripped by gloom and confusion' while city analysts predicted 'the transition from a safe, job-for-life type organization into a meritocracy. To a certain extent, M&S has always been carrying a lot of fat and it is the first time that it has gone on a diet' (ibid). (Financial Times, 11 May and 18 May 1991) reported that M&S has been keen to quash any rumours that the company plans to cut welfare, adopt a less caring approach or change its culture, but in July 1996 the company stopped providing free breakfasts (on

the grounds that not all staff enjoyed this 'perk') and the very notion of a full-time employee was abolished (staff are now paid for hours worked rather than a set monthly salary).

My stand is that, in an organization where there is a union, workers make demands from management through the union but where there is no union, workers are at the mercy of management. Whenever management appears to be benevolent it is a mere truce when it is not convenient for management to be so benevolent, workers have no alternative other than to resign and in a situation of high rate of unemployment it is suicidal so to do. This exactly was what happened in Marks and Spencer!

FRAME OF REFERENCE

The way one perceives a phenomenon determines to a very large extent how one expects others to treat the phenomenon. It is a form of stereotype, a mindset or an attitude that determines behaviour. Just as we have theory X managers and theory Y managers based on the respective assumptions of theories X and Y as propounded by Mc Gregor.

Salamon (1992) relying heavily on the work of Fox 1966 and 1973 and Hyman (1975) in describing the nature of employment organizations considers the unitary, pluralistic and the Marxist perspectives with a caveat that there is as much variation within each perspective as there are differences between them.

The Unitary Perspective

The unitary perspective emphasizes the organization as a coherent and integrated team 'unified by a common purpose'. It can encompass either an authoritarian or paternalistic approach to the role of management. It is based on the assumption that in the organization there is a single authority/loyalty structure and members of the organization share a set of common values, interests and objectives. Management's prerogative (its right to manage and make decisions) is legitimate, rational and accepted and any opposition to it is seen as irrational. The organization in such a situation is in basic harmony and conflict is unnecessary and exceptional. Conflict is perceived as an irrational activity. Any transgression of management's rule is viewed as aberrant rather than non-conformist behaviour. It is also believed that when conflict arises it is primarily frictional rather than structural and is caused by clashes of personalities within the organization, poor communication by management of its plans and decisions, a lack of understanding on the part of employees that management decisions and actions are for the benefit of all, or caused by agitators. Management's approach to resolving such conflict is often based on authoritarian or paternalistic style. The use of coercion is regarded as a legitimate use of managerial power. Trade unions are regarded as an intrusion into the organization from outside which competes with management for the loyalty of members. Many managers perceive trade unions as little more than an historical anachronism that had a role within the frame-work of nineteenth century employer/employee relations but, with enlightened management in the twentieth century, are no longer necessary to protect the employees' interests. It is to be noted that management may be disposed to accept the existence of unions in the determination of terms and conditions of employment (market relations), it is certainly reluctant to concede any role for trade unions in the exercise of authority and decision making within the organization (managerial relations). The existence of trade unions and collective bargaining is suffered, rather than welcomed and is to be resisted wherever possible. Unitary perspective of organizations is predominant among managers and the view is referred to as managerial ideology. Managers hold on to this view because it legitimizes managers' authority role as being in the best interest of the organization.

The Pluralist Perspective

Trade unions exist in organizations as one of the sectional interests and this view of organizations is the received orthodoxy in many western societies. Fox believes that with this perspective, there is relatively widespread distribution of authority and power within the society, also that there is a separation of ownership from management, a separation of political and industrial conflict, and an acceptance and institutionalization of conflict in both spheres. The organization is perceived as being multi-structured and competitive in terms of groupings, leadership authority and loyalty, and this, Fox argues gives rise to a complex of tensions and competing claims which have to be 'managed' in the interests of maintaining a viable collaborative structure. The underlying assumption of this approach, therefore, is that the organization is in a permanent state of dynamic tension resulting from inherent conflict of interest between the various sectional groups and requires to be managed through a variety of roles, institutions and processes. Conflict between management and employees is both rational and inevitable. Consequently conflictual behaviour may arise in respect of both specific situations and general 'management principles.'

Under this perspective there has to be an acceptance of the need for shared decision making and the legitimacy of management's role is not automatic but must be sought and maintained by management itself (management by consent rather than management by right). Fox argues that the interest groups in the organizations have right of free association as they can assert their aspirations and claims and it is the role of law to define the limits of socially acceptable collective actions and use them.

Trade unions do not of themselves, cause conflict within organizations but simply provide a highly organized and continuous form for sectional interests which would exist anyway.

The Marxist Perspective

This perspective is based on the capitalist society where there are the haves and the have-nots, where a group has the authority to issue orders while the other and larger group has the duty to obey such instructions/orders. A capitalist society is a class society. The mere exercise of managerial authority is a potential source of conflict. The contract of employment is said to be entered into by equals but from this perspective challenges the notions of both 'freedom' and 'equality'. The application of the law in respect of the contract of employment is perceived as being asymmetrical. As Hyman points out the obligations undertaken by the employer are relatively precise and specific whilst the obligations on the worker…. Are imprecise and elastic. Hyman believes that in the eye of the law "equality" of the employment contract gives the employer the right to issue orders, while imposing on the worker the duty to obey hence in Marxist perspective the law is supportive of management's interest and position rather than being an independent referee between competing interests.

It has been stated earlier on that a frame of reference is a mindset, hence a management that embraces the unitary perspective assumes trade unions are intrusion in industry. Trade unions compete with management for the loyalty of workers. Trade unions restrict management's autonomy. Trade unions are cost raising institutions. With these assumptions such a management will either be anti-union or avoid unions by whatever means.

A management that embraces pluralistic perspective realizes that trade union is one of the sectional interest groups in the industry and the relationship for the survival of the organization can only be symbiotic rather than being parasitic hence ways of managing the interest groups should the focus of management.

WHY ARE MANAGEMENTS ANTI-UNION OR WHY DO THEY AVOID UNIONS?

Managements are anti-union or do not want unions and they adopt any conceivable device to achieve this because, managements want to be in charge at all cost. The effect of the rules made by collective bargaining is to limit the power and authority of employers and it lessens the dependence of employees on market fluctuations and the arbitrary will of management.

Union Avoidance Techniques

Management employ human resource management strategies and practices to keep unionization away from their companies. Practices such as promotion from within, put in place an influential personnel – human resource department, and above-average pay and benefits. In other words, employers offer most of the things a union can offer except that employers cannot duplicate independent employee voice that a union provides. Another employer tactic is the double-breasted arrangement which refers to what happens in multi-plant companies where established unions are recognized while unions in newer plants are not so recognized.

Management's perspective is dynamic depending on varying circumstances. Barbash reports that 'many tough bargainers (among employers) prefer the union to a situation where there is no union. Most of the employers in rubber, basic steel and the automobile industry fall in this category.' The idea then was that an effective union could help masses and communicate the interests of employees to management, thus helping management make better decisions. But product-market pressures, such as foreign competition and deregulation have contributed to increasing employer resistance to unions.

FACTORS THAT MAKE THE FORMATION OF A UNION IMMINENT

Otobo (1995) in one of his polemics states the factors that make the formation of a trade union imminent are
1) There must be widespread wage employment
2) There must be widespread grievances
3) The individual person or prospective worker must be both physically and legally free to move about for wage employment and
4) Workers must solely or predominantly depend on their wages to survive.

At the beginning of industrialization occasioned by the industrial revolution, there were widespread wage employment, grievances were widespread to the extent that the workers involved referred to industrial capitalism as wage slavery, prospective workers were both physically and legally fit to move about in search of employment since the breakdown of feudalism and workers left their homes for urban centres hence they depended solely or predominantly on their wages for survival. Whitehead (1977) admirably gave this account.

CONCLUSION

If management embraces unitary perspective as its frame of reference, it will regard a trade union as an unnecessary intrusion into its organization, hence it will be anti-union or avoid unionism. In other words, it will manage without unions. If on the other hand, it embraces pluralistic perspective, it will consider a trade union as one of the interest groups in its organization, hence it will manage with unions.

However, if workmen are driven to a situation, whereby those things that management has been using to keep unions away are now withdrawn as it happened in Marks and Spencer if those conditions above are met workmen will form trade unions.

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Socio-Demographic Determinants of the Experience of Physical Violence among Intimate Partners in Nigeria

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ABSTRACT

In many cultures women are viewed and treated as inferior or as second-class citizens. Gender-based violence in all its forms is an on-going problem, even in the so-called developed world. Such violence has been associated with serious health consequences, including physical, sexual, and reproductive health, psychological and behavioural problems, as well as fatal health outcomes such as homicide, suicide, and maternal mortality. This paper examined the socio-demographic factors that may predispose a Nigerian woman to experience Intimate Partner Violence (IPV). The paper made use of secondary data from (raw data) NDHS 2013. Data were collected from 21,004 respondents comprising women of childbearing age who are currently married or in union with a partner. The variables required for the analysis were taken from the raw data and analysed using both the descriptive and inferential statistics. Women in the study population reported to have experienced at least one form of physical violence by their partner, slap is the most prevalent form of IPV observed from the findings of this study, also "offence" that was perceived to be the most justified for wife beating is if a woman goes out without telling. Findings also revealed the education level affects experience of IPV, also women with primary education are likely to experience IPV more. It was recommended that there should be a reduction in spousal age difference. Also the issue of child marriage should be abolished, for her to attain some maturity and get certain level of education that will equip her for the future.

Keywords: Intimate Partner Violence, Nigerian, Socio-Demographic, Women

BACKGROUND OF THE STUDY

November 25 is the day designated by the United Nations General Assembly as the International Day for the Elimination of Violence against Women with a view to raising public awareness of violations of the rights of women. Why was this deemed necessary?

35% of women and girls globally experience some form of physical and sexual violence in their lifetime, with up to 70% of women facing this abuse in some countries. Violence against women is a global pandemic that takes place in both public and private spaces [25].

In many cultures women are viewed and treated as inferior or as second-class citizens. Prejudices against them are deep-rooted. Gender-based violence in all its forms is an ongoing problem, even in the so-called developed world [26]. Such violence has been associated with serious health consequences, including physical, sexual, and reproductive health, psychological and behavioural problems, as well as fatal health outcomes such as homicide, suicide, and maternal mortality [17].

Nigeria is one of the countries with high incidence of female domestic abuse in sub-Saharan Africa, where two-thirds of women are found to be suffering male partner violence [4]. As in most African societies, the context of female domestic abuse in Nigeria is defined by women's societal relations with men. Women are traditionally obliged to surrender their entirety to their husbands, in addition to being domestically available to gratify their male partner's physical, psychological and sexual desires. Thus, women's transgressions of these expected roles lead to their beating and coercion, in an attempt to restore traditional gender order and male power.

In most Nigerian communities, domestic abuse of a female partner is acceptable and justified as made evident in Oyediran and Isiugo-Abanihe's [18] study that found that more than half of ever-married women accepted and justified wife beating and hitting as a necessary male 'duty' in other to assert manhood within the traditional family.

The 2013 National Demographic and Health Survey (NDHS) [13] shows men's attitudes toward wife beating. Twenty-five percent of men agree that wife beating is justified in at least one of the specified situations. This proportion is slightly lower than in the 2008 NDHS (30 percent). Although the decrease is not large, it may indicate that wife beating is increasingly unacceptable among men. It is however interesting to note that more women (35 percent) than men (25 percent) agree that husbands are justified in beating their wives for at least one specified reason.

Domestic violence is a widespread social problem, but due to cultural considerations especially as it manifests in a culture of silence and low reportage by media and victims, it is extremely difficult to obtain a reliable data on the incidence and prevalence of domestic violence in most neighbourhoods. Equally unreliable are the data based on official documents (police and hospital records) and this is because instances of abuse are never reported or under-reported. Issues of violence in Nigeria are believed to belong to the private realm, something that should be shielded from public consumption or outside enquiry. This culture of silence reduces the shame attached to the victim rather than condemning the perpetrators of such crimes [1].

In general, families in Nigeria have their own peculiar characteristics which make up the very foundations of the relationship between parents, one that others cannot meddle with and is considered as a private matter. Such privacy between couples is not only respected by relatives but also is observed in public places. Consequently, in case of conflicts, bystanders or onlookers may decline to interfere in what is seen as a private matter. The fact that many couples also consider their disagreements and conflicts a private matter renders them more unlikely to seek counselling and assistance, which in turn, can fuel the cycle of violence and ultimately lead not only to the development of psychological problems for the victim but also to the suffering of the family as a whole. This problem is further compounded by the fact that since men have the tendency to deny the occurrence of family abuse, the solution rests on the wife to seek help in other to prevent the breakup of the family. Such undertaking seems rather difficult given the traumatic experiences she has endured. Some agencies and self-help groups have been successful in increasing social awareness about domestic violence. However, more efforts are needed towards empowering and enabling the victims to win back the life they have lost because of domestic violence.

This paper examined the socio-demographic factors that may predispose a Nigerian woman to experience intimate partner violence. In other words, the paper examined the contribution of

husband's characteristics, women characteristics and the joint characteristics of the husband and the wife to the experience of intimate partner violence by women.

According to the Federal Ministry of Health [9], very few studies have been carried out on intimate partner violence in Nigeria. Credence was lent to the research findings of Odujirin [15] who reported prevalence of 68.1% for domestic abuse among women in Lagos. The sexual abuse reported is consistent with previous studies in Nigeria and elsewhere [14, 10, 16, 2, 5, 8, 7, 12]. Countless men, more especially women and girls in Nigeria are subjected to violence by some members of their families and within their communities. The lack of official statistics makes assessing the extent of the violence an almost impossible task, but survey reports [11] suggest levels of violence are shockingly high. More than a third and in some groups nearly two thirds of women and girls in Nigeria are believed to have experienced physical, sexual or psychological violence in the family [3, 24]. Also, a past 5-year prevalence of IPV was estimated at 4% and lifetime IPV at 30%, with 13% of women reporting lifetime emotional or financial abuse specifically; self and official reports underestimate IPV, and rates varied according to where and how women are asked (e.g., rates in health settings generally higher) [21, 20]; about 80% of intimate partner homicides in Canada are committed by men against women; with the rate 4 times higher in women than in men (0.44 per 100,000 females aged 15 and over versus 0.11 for males aged 15 and over) [19].

According to Tjaden and Thoennes [22], on violence perpetrated against women, Research initially from North America and Europe, but increasingly from other regions, has demonstrated the high prevalence of violence against women globally and its adverse physical and mental health outcomes, in both the short and long term. a multi-country study on women's health and domestic violence against women gave the following global statistics which states that between 13% and 61% of women 15–49 years old report that an intimate partner has physically abused them at least once in their lifetime. Also, between 6% and 59% of women report forced sexual intercourse, or an attempt at it, by an intimate partner in their lifetime, from 1% to 28% of women report they were physically abused during pregnancy, by an intimate partner. More than one in three women in the United States have experienced rape, physical violence, or stalking by an intimate partner in their lifetime. In the United States, women experience 4.8 million incidents of physical or sexual assault annually. However, the true prevalence of IPV is unknown because many victims are afraid to disclose their personal experiences of violence. Intimate partner violence caused 2,340 deaths in 2007; of this number, 1,640 were female and 700 were male. Studies by the 1990s showed that both men and women could be abusers or victims of domestic violence.

It has been perceived that Intimate partner rape/violence against women has incalculable costs to present and future generations and it undermines human development [23]. It limits a woman's personal growth, her productivity, her socio-economic roles, and her physical and psychological health. Most of all it negates the right of women as humans. According to [6], violence can affect women and girls physically, psychologically, and socially, sometimes with lifelong results. Besides, women's aspirations and achievements are powerfully inhibited, not just by the injuries of physical attacks but by the implicit threat to social development [12]. Intimate partner violence is a key component of social problems. By subjecting the women to rape/violence and without a social structure that endeavours to stop this practice, the women could be made to believe that they are inferior to their counterparts and that they deserve the abuse. This can affect their self-image and perception of men in general. Bunch [6] reported that violence against women and girls is the most pervasive violation of human rights in the world.

This paper made use of secondary data from (raw data) NDHS 2013. Data were collected from 21,004 respondents comprising women of childbearing age who are currently married or in union with a partner. The variables required for the analysis were taken from the raw data and analysed using both the descriptive and inferential statistics. In other words, percentage analysis and logistic regression models were used to carry out the data analysis.

FINDINGS

Socio-Demographic characteristics of the respondents

Table 2.1 reveals that the largest percentages of the respondents are within the age of 25 to 39 years (22.34%) followed by those in the age group 30 to 34 years (about 18%). The least represented group is people aged 15 to 19 years only comprising 7.81% of the total respondents while the mean age of the respondents is about 31 years. The table further shows that there is an early onset of marriage or cohabitation with a mean age of 18 years as at first cohabitation. 44.06% of the respondents entered their first union within the age 15 to 19 years, with almost a quarter of the respondents reported to have begun living with a partner within the age 10 to 14 years. Only 2.5% entered their first union after age 30.

Monogamy is the prevalent family type as 76.2 per cent of the respondents are in monogamous relationship while only 23.8 per cent are in a polygynous relationship. Majority of the respondents are Muslims accounting for more than half of the study population (54.28%) as against the 44.18% that are Christians, reflecting the dominance of the two religions. Only a minority of 1.54% do not belong to either religious groups. Most of the respondents also have at least one living child with only about a tenth reporting to have no living child.

With respect to their places of residence, about two thirds of the respondents (63.95%) reside in the rural areas suggesting a relatively low level of urbanization. This probably accounts for the high proportion of women with no formal education (43.17%), with only 8.38 per cent having tertiary education.

The data shows that sales is the most popular form of employment among the respondents as 37.77 per cent reported it as their occupation. 28.8% however are not engaged in any form of occupation.

Table 2.1: Percentage Distribution of Respondent's by their Socio-Demographic characteristics

		Frequency	Percentage
Age group	15-19	1,641	7.81
	20-24	3,491	16.62
	25-29	4,693	22.34
	30-34	3,801	18.10
	35-39	3,097	14.74
	40-44	2,232	10.63
	45-49	2,049	9.76
Age at first cohabitation	10-14	5,084	24.20
	15-19	9,255	44.06
	20-24	4,381	20.86
	25-29	1,759	8.37
	30 years and above	525	2.50
Religion	Christianity	9,280	44.18
	Islam	11,400	54.28
	Others	324	1.54
Place of Residence	Urban	7,572	36.05
	Rural	13,432	63.95
Children ever born	No living child	2,123	10.11
	At least one living child	18,881	89.89
Level of Education	No Education	9,067	43.17
	Primary education	4,245	20.21
	Secondary	5,932	28.24
	Higher	1,760	8.38
Occupation	Not working	6,049	28.80
	Professional/technical/managerial	1,115	5.31
	Clerical	87	0.41
	Sales	7,934	37.77
	Agricultural – Self employed	179	0.85
	Agricultural – Employee	2,367	11.27
	Household and domestic	28	0.13
	Services	1,017	4.84
	Skilled Manual	2,189	10.42
	Unskilled manual	10	0.05
	Other	29	0.14

Source: NDHS 2013

Respondents' Partner's characteristics

Table 2.2 discusses the characteristics of the respondent's husbands. As at the time of the survey, the mean age of the respondent's husbands was about 41 years; this is ten years above the mean age of the respondents. This indicates that husbands in the study population are ten years older than their wives on average.

Table 2.2: Percentage Distribution of Respondents by their Partner's Socio-Demographic characteristics

		Frequency	Percentage
Level of Education	No Education	7,597	36.17
	Primary education	3,948	18.80
	Secondary	6,363	30.29
	Higher	3,096	14.74
Occupation	Not working	379	1.80
	Professional/technical/managerial	2,733	13.01
	Clerical	172	0.82
	Sales	3,779	17.99
	Agricultural – Self employed	960	4.57
	Agricultural – Employee	6,512	31.00
	Household and domestic	2	0.01
	Services	1,233	5.87
	Skilled Manual	4,294	20.44
	Unskilled manual	935	4.45
	Other	5	0.02

Source: NDHS 2013

Majority of the respondents' partners are employed as only 1.8 per cent were reported as not working. Most of them however, (31%) are employed in the agricultural sector, while about a fifth of them have manual skills. This shows that the majority still engages in agrarian economy.

Table 2.3: Differential characteristics of female respondents and their husbands

		Frequency	Percentage
Type of union	Married	20,263	96.47
	Living with Partner	741	3.53
Family type	Monogamy	16,005	76.20
	Polygyny	4,999	23.80
Cohabitation Duration	0-4	4,809	22.90
	5-9	4,414	21.02
	10-14	4,068	19.37
	15-19	2,961	14.10
	20-24	2,162	10.29
	25-29	1,479	7.04
	30+	1,111	5.29
Disparity in education	Both not educated	6,711	31.95
	Husband only educated	2,356	11.22
	Wife only educated	886	4.22
	Both educated	11,051	52.61
Age difference	Wife Older	230	1.10
	Age mates	280	1.33
	1-5 years	5,776	27.50
	6-10 years	7,377	35.12
	>10 years	7,341	34.95

Source: NDHS 2013

Differential characteristics of female respondents and their husbands
Table 2.3 shows the differential characteristics between the respondents and their husbands. The results show that only a few of the respondents (1.10%) are older than their husbands. In the same vein, only a small proportion of the respondents (1.33%) are of the same age with their husbands. This shows what is prevalent across the study population is for husbands to be older than their wives. The results further show that most husbands of the respondents are older than their wives by one to ten years. A total of 27.5 per cent of the respondents have

husbands older than them by less than 6 years. On the other hand, 35.12 per cent of the respondents have older husbands of between six to ten years, while about 35 per cent have husbands older than them by more than ten years.

With regards to their respective levels of educational attainment, the majority of the respondents and their husbands (52.61%) have at least a form of education, while only a minority of 4.22 per cent are educated while having husbands with no formal education.

Table 2.4: Percentage Distribution of Respondents by Prevalence of the experience of IPV

	Frequency	Percentage
Ever experienced any form of physical violence by partner Yes	2,988	14.23
Ever been pushed, shook or had something throw at by partner Yes	1,307	6.22
Ever been slapped by partner Yes	2,626	12.50
Ever been punched or hit by something harmful by partner Yes	656	3.12
Ever been kicked or dragged by partner Yes	1,060	5.05
Ever been strangled or burnt by partner Yes	128	0.61
Ever been threatened with knife/gun or other weapons by partner Yes	138	0.66
Ever had arm twisted or hair pulled by partner Yes	536	2.55

Source: NDHS 2013

Prevalence and resultant effects of the experience of IPV
Table 2.4 examines the prevalence level of the experience of Intimate Partner Violence. 14.23 per cent of the women in the study population reported to have experienced at least one form of physical violence by their partner.

The indicators used were if the respondent has ever been pushed, shook, or had something thrown at; slapped; punched or hit by something harmful; kicked or dragged; strangled or burnt; threatened with knife or gun or other weapon; or ever had her arm twisted or hair pulled by her partner. Physical violence in the form of strangulation or being burnt by partner and threats by guns, knives or other weapons are shown to be the least prevalent with only 0.61 per cent and 0.66 per cent of respondents reporting to have ever experienced such from their partners.

Slaps from partners however is seen to be the most prevalent form of physical violence observed as 12 per cent of the total respondents claimed to have been slapped by their partner before and a staggering 87.88 per cent of those who have ever experienced any form of physical abuse by their partner reporting to have been slapped at least on one occasion by their partner.

Table 2.5: Percentage Distribution of the Respondents who have experienced IPV

	Frequency	Percentage
Ever had any injury because of partner's actions – Yes	846	4.03
Ever had bruises because of partner's actions1 – Yes	746	88.18
Ever had eye injuries, sprains, dislocations or burns because of partner2 Yes	321	37.94
Ever had wounds, broken bones, broken teeth or other serious injury because of partner3 Yes	153	18.09

Source: NDHS 2013

Table 2.5 however goes on to describe the effects of these forms of abuse on the victims. 4.03% of the respondents reported that the abuse by their partners has resulted in injury, with bruises (88.18 per cent) being the major type of injury suffered by those who have ever been injured by their partner. 18.09 per cent of those who have ever been injured by their partner reported to have had serious injuries in the form of wounds, broken bones, and broken teeth.

Table 2.6: Perception of women to IPV

	Frequency	Percentage
Beating justified for any of the listed reasons Yes	8,062	38.38
Beating justified if wife goes out without telling husband Yes	6,005	28.59
Beating justified if wife neglects the children Yes	5,703	27.15
Beating justified if wife argues with husband Yes	4,838	23.03
Beating justified if wife refuses to have sex with husband Yes	4,584	21.82
Beating justified if wife burns the food Yes	3,271	15.57

Source: NDHS 2013

Perception of women to the experience of intimate partner violence

Table 2.6 describes the perception of the justification of wife beating among women. 38.38% of the respondents agreed that wife beating is justified for certain reasons. The reasons listed were if the wife goes out without telling her husband; neglects the children, argues with husband; refuses to have sex with husband; or burns the food.

Wife beating was said to be justifiable by 27.15 percent of the respondents if a woman neglects the children.23.03% of the respondents also agreed that a man is justified in beating his wife if the wife argues with him. The "offence" that was perceived to be the most justified for wife beating is if a woman goes out without telling her husband as about 30 per cent of the women agreed with it.

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[1]As percentage of those that have ever been injured by partner
[2]As percentage of those that have ever been injured by partner
[3]As percentage of those that have ever been injured by partner

Table 2.7: Percentage distribution of Respondents by their socio-demographic   characteristics and experience of Intimate Partner Violence

Characteristics	Never experienced physical violence	Ever experienced physical violence	Total
Age in 5-year groups			
15-19	92.20	7.80	1,641
20-24	87.65	12.35	3,491
25-29	85.36	14.64	4,693
30-34	83.14	16.86	3,801
35-39	84.18	15.82	3,097
40-44	84.86	15.14	2,232
45-49	86.68	13.32	2,049
$x2=97.35^{**}$			
Age at first cohabitation			
10-14	89.42	10.58	5,084
15-19	84.97	15.03	9,225
20-24	82.47	17.53	4,381
25-29	86.13	13.87	1,759
30 years +	91.05	8.95	525
$x2=111.57^{**}$			
Religion			
Christian	77.11	22.89	9,280
Islam	93.06	6.94	11,400
Others	77.47	22.53	324
$x2=1.1e+03^{**}$			
Place of residence			
Urban	84.60	15.40	7,572
Rural	86.44	13.56	13,432
$x2=13.35^{**}$			
Children Ever Born			
No living child	92.09	7.91	2,123
At least one living child	85.06	14.94	18,881
$x2=77.13^{**}$			
Level of education			
No education	92.07	7.93	9,067
Primary	77.39	22.61	4,245
Secondary	80.70	19.30	5,932
Higher	90.68	9.32	1,760
$x2=699.39^{**}$			
Respondent's occupation			
Not working	90.28	9.72	6,049
Professional/technical	88.88	11.12	1,115
Clerical	88.51	11.49	87
Sales	86.03	13.97	7,394
Agricultural-Self employed	81.56	18.44	179
Agricultural-Employee	71.19	28.81	2,367
Household and domestic	85.71	14.29	28
Services	81.71	18.29	1,017
Skilled manual	88.58	11.42	2,189
Unskilled manual	90.00	10.00	10
Other	93.10	6.90	29
$x2=555.06^{**}$			

Source: NDHS 2013

Table 2.7 shows the percentage distribution of the women by selected socio demographic characteristics with respect to the experience of intimate partner violence. The table shows that more respondents have never experienced physical abuse by their partners across all the selected characteristics as compared to those who have experienced any form of physical assault by their partner.

The chi square value for current age of the respondent is statistically significant suggesting that it is related to the experience of IPV. The lowest incidence rate of IPV is seen in the age group 15-19 years which increases till age group 30-34 years before decreasing again. Women's age as at first cohabitation was also considered to see if the age at which a woman begins to live with a man has any relationship with her experience of physical abuse by her partner. The chi-square value is also significant showing that there is a significant relationship between the two variables. The same goes for religious affiliation, where the percentage distribution suggests that women who practice Islam have the least incidence of experience of IPV as only 6.94 per cent of the respondents reported ever experiencing any form of abuse by their husband.

With respect to the type of place of residence, the chi-square value shows that there is a significant relationship between the two variables. The chi-square value of the number of living children also reveals a significant relationship between this variable and experience of IPV. It is also interesting to note that women with no living children have the least incidence of physical abuse by their partners, while women who have at least one living child have a higher reported incidence of experience of physical assault.

The level of education of a woman was also assessed to see if it has any relationship with a woman's experience of IPV and the chi-square result showed that it does. Highest experience of IPV was reported by women with primary education followed by those with secondary while those with no formal education and those with post-secondary education reported a relatively low incidence rate. Women's occupation was also seen to have a statistically significant relationship with experience of IPV.

Table 2.8: Logistic model of Likelihood of IPV experience by women's socio-demographic characteristics

Characteristics	Odds Ratio	S.E	P value
Age group			
15-19 (r)	-	-	-
20-24	1.0915	.1231	0.437
25-29	1.2030	.1343	0.098
30-34	1.3606	.1556	0.007
35-39	1.2089	.1426	0.108
40-44	1.1325	.1391	0.311
45-49	1.0307	.1298	0.810
Age at first cohabitation			
10-14 (r)	-	-	-
15-19	1.0679	.0620	0.258
20-24	0.9370	.0646	0.345
25-29	0.7344	.0688	0.001
30 and above	0.4587	.0772	0.000
Religion			
Others (r)	-	-	-
Islam	0.3124	.04425	0.000
Christianity	1.0060	.1408	0.966
Place of Residence			
Rural (r)	-	-	-
Urban	1.0506	.0491	0.292
Children Ever Born			
No living child (r)	-	-	-
At least one living child	1.5214	.1397	0.000
Level of education			
No Education (r)	-	-	-
Primary	1.7020	.1068	0.000
Secondary	1.3951	.0936	0.000
Higher	0.6781	.0799	0.001
Respondent's Occupation			
Not working (r)	-	-	-
Professional/technical	0.9775	.1187	0.851
Clerical	0.9581	.3343	0.902
Sales	1.0971	.0641	0.112
Agricultural-Self employed	0.9794	.1996	0.918
Agricultural-Employee	1.7442	.1229	0.000
Household and domestic	0.9544	.5319	0.933
Services	1.1568	.1120	0.133
Skilled manual	1.0422	.0865	0.619
Unskilled manual	0.5406	.5798	0.566
Other	0.9834	.7291	0.982

Source: NDHS 2013

Log likelihood = -7809.1305
Number of observations = 21,004
Prob < 0.0001

Multivariate Analysis of the likelihood of Women's experience of Intimate Partner Violence by Women's Socio-demographic Characteristics

The aim of this study is to investigate the socio-demographic factors influencing women's experience of IPV in Nigeria.

The basic assumption underlying the specification of this logistic regression model is that the likelihood of women's experience of IPV is dependent on the respondent's socio-demographic

characteristics. The results of the logistic regression model in Table 2.8 shows that the model chi square is statistically significant at p<0.0001. The results further show that women in the age group 30-34 years are about 1.4 times more likely to experience IPV than those in the age group 15-19 years, as it is the age seen to have the least odds of experiencing physical assault among women of reproductive age.

It can also be seen that those who entered into cohabitation at higher ages are less likely to experience domestic abuse than those who start cohabiting with a partner at younger ages. This can be seen as those who start living with a partner at age 30 years and above are 45.8 per cent less likely to experience IPV than their counterparts who start cohabitation at age 10-14 years. Those who started living with a man at age 25-29 years are also 73.4 per cent less likely to experience IPV than those in the reference category, while only those who start cohabiting at age 15-19 years have slightly greater odds (1.07) of experiencing physical assault by their partners than those aged 10-14 years.

Using religious affiliation as an indicator, it is shown that those who practice Islam are 31.2 per cent less likely to experience IPV than those who practice Traditional/Other religions, while women practising Christianity are just as likely to experience IPV as their counterparts in the reference category.

Place of residence as a factor shows that respondents have almost equal odds of experiencing IPV irrespective of where they live, as an odds ratio of 1.05 suggests only a slight increase in likelihood for those residing in the urban areas. Interestingly, women who have at least one living child are shown to be 1.5 times more likely to experience IPV than those with no living child.

Assessing the respondents' level of education, it was seen that women with primary education only are about twice as likely to experience IPV than their counterparts with no formal education, those with secondary education 1.4 times more likely, while those with higher education are about 68 per cent less likely to be victims of IPV compared to those in the reference category.

The various forms of women's occupation also showed no major differences in likelihood of experiencing IPV in comparison to those not working, except for women who are employed in the agricultural sector and women who engage in unskilled manual jobs as they are about twice as likely and 54 per cent less likely to experience IPV respectively.

CONCLUSION

This paper examined the socio-demographic factors that may predispose a Nigerian woman to experience intimate partner violence. The report from the study shows the mean age of the respondent's husbands was about 41 years; this is ten years above the mean age of the respondents. This indicates that husbands in the study population are ten years older than their wives on average. 14.23 per cent of the women in the study population reported to have experienced at least one form of physical violence by their partner. However, Slaps from partners is seen to be the most prevalent form of physical violence observed as 12 per cent of the total respondents claimed to have been slapped by their partner and a staggering 87.88 per cent of those who have ever experienced any form of physical abuse by their partner reporting to have been slapped at least on one occasion by their partner, and bruises (88.18 per cent) being the major type of injury suffered by those who have ever been injured by their partner, it was found that violence can affect women and girls physically, psychologically and socially,

sometimes with lifelong results. Also, it was seen that the "offence" that was perceived to be the most justified for wife beating is if a woman goes out without telling her husband as about 30 per cent of the women agreed with it.

From the women characteristics, those who practice Islam have the least incidence of experience of IPV also interesting to note that women with no living children have the least incidence of physical abuse by their partners, while women who have at least one living child have a higher reported incidence of experience of physical assault.

For the relationship between the joint characteristics of the husband and the wife, to the experience of intimate partner violence by women, the logistic regression model shows that women in the age group 30-34 years are about 1.4 times more likely to experience IPV than other age groups, while those who enter into cohabitation at higher ages are less likely to experience domestic abuse than those who start cohabiting with a partner at younger ages. It was also seen that women with primary education are about twice as likely to experience IPV than their counterparts with no formal education, while women who are employed in the agricultural sector and women who engage in unskilled manual jobs are about twice as likely and 54 per cent less likely to experience IPV respectively.

RECOMMENDATIONS

It was recommended that there should be a reduction in spousal age difference, because the higher the age difference, the higher the propensity of IPV, also the issue of child marriage should be abolished and both the male and the female child should be given equal educational opportunities for self-actualization as this will make the girl – child attain to maturity and also attain some level of education that will make her able to stand by herself and not relying solely on any man.

Members of the Public should be informed through mass media and other means of awareness creation to the fact that IPV is a public health problem, and of the urgent need to start addressing the societal norms that drive it, such as our male-controlled systems of socialization and cultural practices (patriarchal) which favour the interests of men above those of women. Non-Governmental Organizations (NGOs) should champion this public based campaign to eradicate/eliminate gender-based violence against women in our society

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