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Evaluate Employee Factors Influencing Customer Service Levels at South African SMEs Steel Industry

By Louise Van Scheers
University of South Africa, Unisa

Abstract - In response to an increasing competitive market place, growing research attention is being devoted in factors contributing to desirable customer outcomes. Front-line service employees, placed at the organisation-customer interface and representing an organisation to its customers, play a pivotal role in service encounters, which often involve dyadic interactions between customers and service employees (Solomom, Suprenant, Czepiel, & Gutman, 2005 in Liao & Chuang: 2004). An organisation cannot always rely on customers to make their feelings known, however, and so it may deliberately set out to measure customer satisfaction levels (McDaniel, 2006:267). The aim of this research is to identify employee factors influencing customer service levels in the South African steel industry research was conducted at two leading and dominant South Africa steel manufactures. The conducted research established that there is a general lack of customer service culture at the steel manufactures, there can be pockets of excellence, but these seem to be overshadowed by the attitude of carelessness. The research recommends that mmanagement includes customer service in the balance score card as a key performance management measure so that there is change in employee attitude to a positive one that will help enhance customer service.

Keywords : customer service levels; south african steel manufactures; employee factors influencing customer service; customer service culture; balance score card.

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EVALUATE EMPLOYEE FACTORS INFLUENCING CUSTOMER SERVICE LEVELS AT SOUTH AFRICAN SMES STEEL INDUSTRY

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Evaluate Employee Factors Influencing Customer Service Levels at South African SMEs Steel Industry

Louise Van Scheers

Abstract - In response to an increasing competitive market place, growing research attention is being devoted in factors contributing to desirable customer outcomes. Front-line service employees, placed at the organisation-customer interface and representing an organisation to its customers, play a pivotal role in service encounters, which often involve dyadic interactions between customers and service employees (Solomom, Suprenant, Czepiel, & Gutman, 2005 in Liao & Chuang: 2004). An organisation cannot always rely on customers to make their feelings known, however, and so it may deliberately set out to measure customer satisfaction levels (McDaniel, 2006:267). The aim of this research is to identify employee factors influencing customer service levels in the South African steel industry research was conducted at two leading and dominant South Africa steel manufactures. The conducted research established that there is a general lack of customer service culture at the steel manufactures, there can be pockets of excellence, but these seem to be overshadowed by the attitude of carelessness. The research recommends that mmanagement includes customer service in the balance score card as a key performance management measure so that there is change in employee attitude to a positive one that will help enhance customer service.

The conducted research recommends that employee motivation may be improve by:

- Organising a workshop by an external facilitator to discuss issues leading to lack of motivation from account/key account managers and service managers.
- Creating a motivating climate where there is effective management – leadership.
- Creating a shared value system, this will create commitment to a set of principles guiding and directing work behaviour.

Keywords : customer service levels; south african steel manufactures; employee factors influencing customer service; customer service culture; balance score card.

I. Introduction

Front-line service employees, placed at the organisation-customer interface and representing an organisation to its customers, play a pivotal role in service encounters, which often involve dyadic interactions between customers and service employees (Solomom, Suprenant, Czepiel, & Gutman, 2005 in Liao & Chuang; 2004). An organisation cannot always rely on customers to make their feelings known, however, and so it may deliberately set out to measure customer satisfaction levels (McDaniel, 2006:267). In this customer satisfaction level measurement key factors driving customer service satisfaction can be identified. Increasing competition in the South African steel industry is forcing businesses to pay much more attention to satisfying customers, including by providing strong customer service. Customer satisfaction should be the primary concern and one of the key performance indicators of any business. It is therefore important for the company to understand factors influencing customer service so that they know where to improve and sustain their customer service levels. This study through literature review will make a significance contribution to customer service and hopefully improve the company's image in the marketplace.

The aim of this research is to evaluate factors influencing customer service levels at a SME of the South African steel industry. South Africa's large, well-developed metals industry, with vast natural resources and a supportive infrastructure, represents roughly a third of all South Africa's manufacturing. It comprises basic iron ore and steel, basic non-ferrous metals and metal products. The iron and steel basic industries involve the manufacture of primary iron and steel products from smelting to semi-finished stages. Ranked the world's 19th largest steel producing country in 2001, South Africa is the largest steel producer in Africa (almost 60% of Africa's total production). Primary steel products and semi-finished products include billets, blooms, slabs, forgings, reinforcing bars, railway track material, wire rod, seamless tubes and plates (http://www.southafrica.info).

South Africa boasts five primary carbon steel producers: ArcelorMittal South Africa, Highveld Steel & Vanadium, Scaw Metals, Cape Gate, and Cape Town Iron & Steel Works (Cisco). The country also has one primary stainless steel producer, Columbus Stainless. South Africa is the continent's largest steel producer, accounting for 48% of total crude steel production in 2008 (http://us-cdn.creamermedia.co.za). The primary steel industry is a significant contributor to the South African economy and earns considerable amounts of foreign exchange. In 2008, the country was ranked

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twenty-first in terms of global crude steel production, by the World Steel Association.

The South African steel retail company supplies different steel products for use in industries like, engineering, automotive, packaging, mining, and construction amongst others. The company manufactures both long steel and flat steel products. To serve the market, the sales and marketing teams was divided into long and flat steel decisions and these teams were in different locations yet some were serving the same customer base. This often created conflict and confusion in the market where different messages would be communicated. With the strategy to one company philosophy it was decided in 2005 to form one marketing team to serve the customers better. The strategy was rolled out further to have one account manager per customer for both long and flat steel products. Previously customer satisfaction surveys were conducted by each marketing team, but with the merger of the two departments instead of each team (long and flat steel products) conducting their own surveys which often meant that the same customers had to complete two questionnaires for the same company. The combined surveys have been conducted annually over the past years. There is however a concern that that feedback in some instances does not change, customers tend to complain about the same issues year after year. It is against this background that this study was initiated, to determine which factors have influence on customer service across the whole steel industry. Unless the company understands what are the key issues customers want and how they want to be served the drive for customer service satisfaction will remain an ideal. And also given the increasing competitive nature of the industry those customers that lack in customer service satisfaction are likely to lose out in the battle to both win and keep customers. Given its dominant position in the market the service levels are at times questioned by the market.

II. Aim and Objectives

The aim of this research is to evaluate the factors influencing customer service levels at SME in steel industry.

The objectives of this research study are to:

- Evaluate employee factors which have an influence on customer service on SMEs in the steel industry.
- Gather information on customer service from managers, frontline employees and customers.
- Recommend appropriate actions to be taken in order to improve customer service levels.

III. Literature Review

As the revenue stream is sourced from customers, this makes them potentially the most important strategic stakeholders. Jenkins (2007:56) argues that the volatility of revenue levels is driven by customer demand, reflecting business cycles, which require an understanding of customers and the nature of their situations. It is therefore of great importance to build a relationship with your customers since they are the users of the service or product you make and, their needs are varied and forever changing. Schonberger & Knod (2004:08) consent to this customer service importance in their supplier-to-customer connection principle. They value the opportunity for face-to-face meetings and real time discussions, which they believe, result in a more satisfying relationship. They argue that getting to know the customer is the first principle of operations management and that all other principles tend to follow naturally from the first one as they are more specific about how to serve the customers better.

a) Customer Service

Kotler (2007:42) defines "service" as any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. "Customer service is anything we do for the customer that enhances the customer experience" argues Harris (1996:02). Harris states that customers have varying ideas as to what they expect from customer interaction, therefore the service provider must know his or her customers, and strive to provide them with excellent customer service.

b) Manufactures of the South African steel industry

South Africa steel industry has five primary carbon steel producers: ArcelorMittal South Africa, Highveld Steel & Vanadium, Scaw Metals, Cape Gate, and Cape Town Iron & Steel Works (Cisco), the first two manufactures were researched.. South Africa is the continent's largest steel producer, accounting for 48% of total crude steel production in 2008. http://us-cdn.creamermedia.co.za A few large players of the steel industry will be discussed next.

ArcelorMittal South Africa (the former Iscor) is the biggest producer of steel on the African continent, with a production capacity of about eight-million tons of liquid steel a year. About 65% of the company's stock is held by foreign investors, including ArcelorMittal group, with a 52% interest. The largest domestic shareholders are the Public Investment Corporation and the Industrial Development Corporation, with 8,95% and 8,79% respectively at the end of 2008. ArcelorMittal South Africa has four major steel operations. The Vanderbijlpark and Saldanha facilities produce flat steel products, of which the company is the largest supplier in Africa. The other two operations, at Newcastle and Vereeniging, produce long steel products. The company has also recently acquired two mills in Mozambique.

Highveld Steel & Vanadium, which is now almost 85%-owned by Russia's Evraz group, is South

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Africa's second-largest producer of carbon steel. The European competition body approved the merger between Highveld Steel & Vanadium and Evraz in 2007, on condition that Highveld dispose of part of its stake in the Mapochs iron-ore and vanadium mine as well as its Vanchem operation, to avoid competition concerns at all levels of the vanadium value chain

c) Employee factors which have an influence on customer service of SMEs in the steel industry

i. *Employee Motivation*

McShane and Von Glinow (2009) argue that motivation refers to the forces within a person that affect his or her direction, intensity and persistence of voluntary behaviour. They argue that motivated employees are willing to exert a particular level of effort (intensity) for a certain amount of time (persistence), toward a particular goal (direction). Harris (2006) simply defines motivation as the individual drive that causes us to behave in a particular way. It is clear that motivation directly affects the amount of input that an employee is willing to put towards organisational goals and objectives, and that the higher the level of motivation, the more the intended input will be.

ii. *Positive employee attitude*

Positive employee attitudes are a necessity in every organisation to keep customers happy and therefore see them return or more business. Freemantle (1992) stresses the importance of positive employee attitudes. He argues that with sensitive and courteous handling, the few customers (about 1 percent) that behave in the most atrocious way, expecting the impossible and putting extreme pressure on the highly stressed front line staff, can become reasonable. He argues that positive employee attitudes are reflected in the simple things of life: a warm smile, a friendly word, a genuine display of interest, a sensitive glance, a welcome piece of unsolicited information, a thank you. He believes that they have a magical effect on customers, yet there is nothing magical about them. He further argues that all the sins of a defective support organisation, for example, excessive delays, an erroneous bill, faulty air conditioning system, can be forgiven by a customer, with a pair of a warm smile and real initiative used by a front line person.

iii. *Employee Empowerment*

According to Liao and Chuang (2004) the behaviour of employees plays an important role in shaping the customer perception of service quality. Zeithaml and Bitner (2003) assert that employees must be trained and empowered to solve problems as they occur. For service employees, there is a specific and real need for recovery training. Because customers demand that service recovery take place on the spot and quickly, frontline employees need the skills, authority, incentives to engage in service recovery. Effective recovery skills include hearing the customer's problems, taking initiative, identifying solutions, improvising, and perhaps bending the rules from time to time (Zeithml & Bitner, 2003).

In customer service, empowerment is to enable or permit customer service providers to make a range of decisions to assist their customers Harris (2006). Customer service providers are continuously faced with customer situations that are unique to the customer and that are somewhere beyond the boundaries of existing policies. Through empowerment, customer service providers are given the discretion to make decisions to assist their customers further. Research supports the premise that salespeople, who adapt their behaviours during customer interactions, as circumstances warrant, are more likely to fulfil the needs and requests of their customers and to thereby increase perceptions of service quality (Bitner, Booms, & Mohr, 2004; Humphrey & Ashforth, 2004; Reid, Pullins, & Plank, 2002) in Ahearne et al (2005).

d) Customer service culture in the organisation

Sadri and Lees (2001), see corporate culture as "an intangible concept, it clearly plays a meaningful role in corporations, affecting employees and organizational operations throughout a firm." They go even further and are of the opinion that culture not only determines the success or failure of the organisation, but that a positive culture can be a competitive advantage over competing firms or organisations. In addition to this point of view, Schein (2009) regards corporate culture as a multi-level concept that should be analysed at every level before it can be understood.

Customer service culture in the organisation is necessary to facilitate the front line service providers to deliver a commendable service to customers. Organisational culture is defined by Robbins (2008:595) broadly as a common perception held by the organisation's members or a system of shared meaning. McShane and Von Glinow (2000) shed more light on it as they define it as, the basic pattern of shared assumptions, values, and beliefs governing the way employees within an organisation think about and act on problems and opportunities. They argue that it defines what is important and unimportant in the company.

IV. Research Methodology

As this research aims to answer a research question by understanding other people's perceptions and experiences with respect to a particular case, in order to gain insight, and also to test an existing hypothesis with a necessity to generalise conclusions, a qualitative (managers interviews) and a quantitative (customers and front line customer service staff questionnaires) paradigms have been deemed appropriate. The researchers used semi-structured

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interviews to collect data from senior management. The choice of semi-structured rather than structured interview was employed because it offered a sufficiently flexibility to approach different respondents differently while still covering the same areas of data collection. The interviews were conducted on a one-on-one basis by meeting the participants face-to-face rather than conduct the interviews telephonically. The researcher used a self-completion questionnaire to collect data from the customers and account/key account managers and service managers who are front line customer service staff. The self-completion questionnaire was emailed to customers and to account/key account managers, and service managers. There was a personal follow-up contact with personal staff to stimulate response.

The researchers have identified three populations to conduct the research. The first population identified above, the customers, is very large such that it is impractical and uneconomical to include all of them in the research. Incidental (accidental) sampling was used to draw a sample of participants (99 customers). There are different market segments for customers, only three market segments will be surveyed through questionnaires 33 customers per market segment were sent questionnaires. These are Service centres; construction & general engineering; and packaging and tube & pipe.

The second population identified, were senior managers, purposive sampling was used to select the managers to be involved in the research. Three (3) senior managers were interviewed to gather information pertaining to customer service. These managers serve the three market segments mentioned above. The last population identified the front line staff. There are 46 account/key account managers and service managers; 30 of these were sent questionnaires. This population was selected because these are employees that are directly and have daily contact with the customers.

In total 178 questionnaires were sent out to respondents on 15 October 2010, 136 of these were returned by 15 November 2011. The response rate achieved is 76 percent which is deemed appropriate.

V. Analysis of Results

The objectives are to identify factors which have an influence on customer service in the South African steel industry, gather information on customer service in the manufactures and steel industry from managers, frontline employees and customers, and to recommend an appropriate customer service strategy to improve customer service levels. The factors that were investigated are employee motivation, positive employee attitude, training and development, employee empowerment, customer service culture in organisations, and rewards (rewarding excellent service), these factors will be analysed based on collected data.

a) Employee Motivation

Motivated employees are willing to exert a certain amount of effort for a certain amount of time towards a certain goal (Robinson 2006, McShane & Von Glinow 2000) which is in this case is customer service. The level at which employees (key account managers and service managers) are motivated to do their job is key towards customer service and customer satisfaction. The respondents' response are indicated in figure 1 below.

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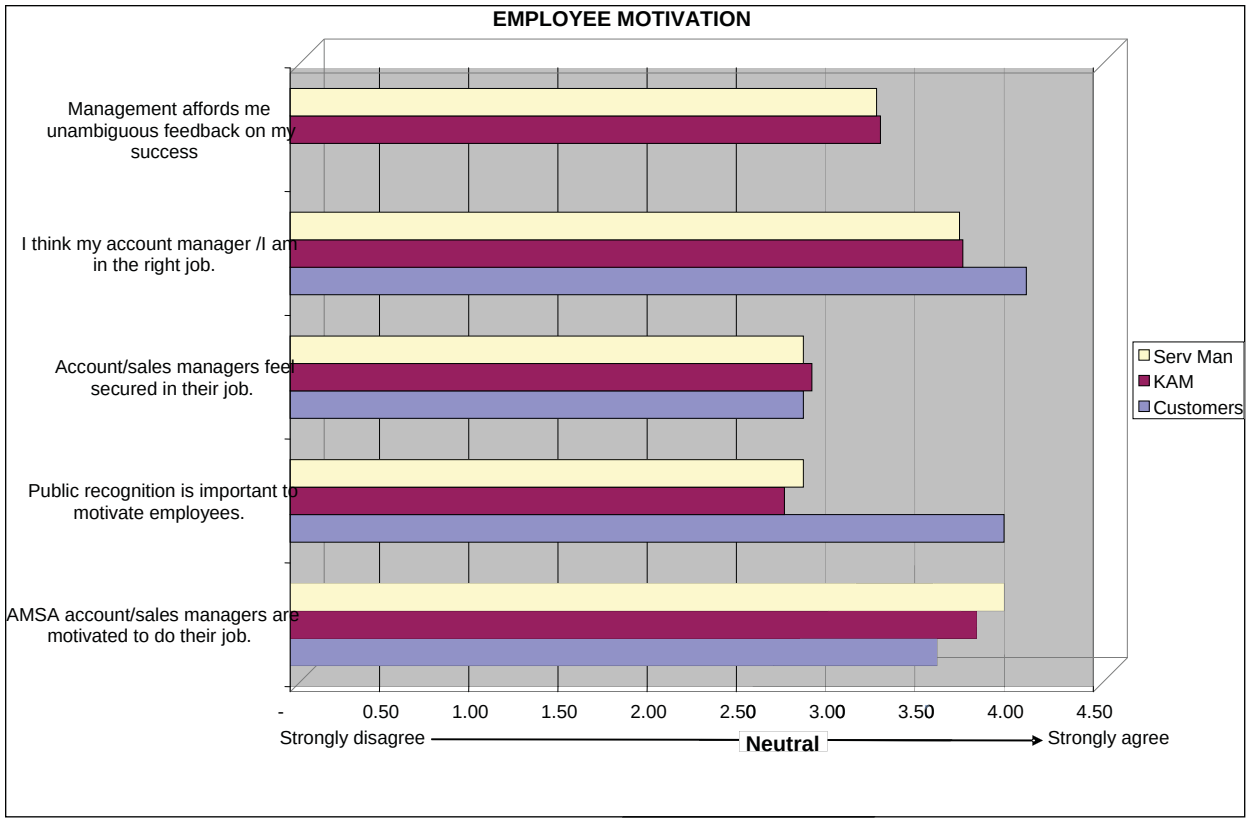

Figure 1 : Employee Motivation

Figure 1 above is an aggregate representation of responses from service managers, key account managers, and customers. The question about management feedback was only asked to employees. Of the respondents who replied 52% responded positively (agree and strongly agree). The other 48% responded negatively in receiving feedback from management.

Figure 1 also shows that the next question on motivation was being in the right job as this could affect the level of motivation. Although employees feel that they are in the right job, that perception is strongly felt by customers which is represented by a rating of over 4. When it comes to job security there is a consensus on all three groups that employees do not feel secured in their jobs. Public recognition has a very low score from employees as compared to customers. Customers agree that public recognition is important to motivate employees whereas employees' perception is that it is not important. This could be linked to the level of feedback or lack thereof received from management.

Figure 1 also shows on the bottom bar chart which records the degree to which employees and customers rate the level motivation for key account managers and managers to do their jobs. Interestingly employees rated themselves as more motivated compared to customer perception. Of the total employee respondents, 77% and 86% of key account managers and service managers respectively, perceive themselves motivated to their jobs, whereas only 56% of customer respondents perceive employees to be motivated.

b) Positive employee attitude

Positive employee attitude like smiling, genuine show of interest is very important for front line employees as this reflects on customer service. As argued by Freemantle (2002:20) some small mistakes can be forgiven if the customer receives the positive attitude displayed by front line employees. Responses on positive employee attitude are depicted in Figure 2.

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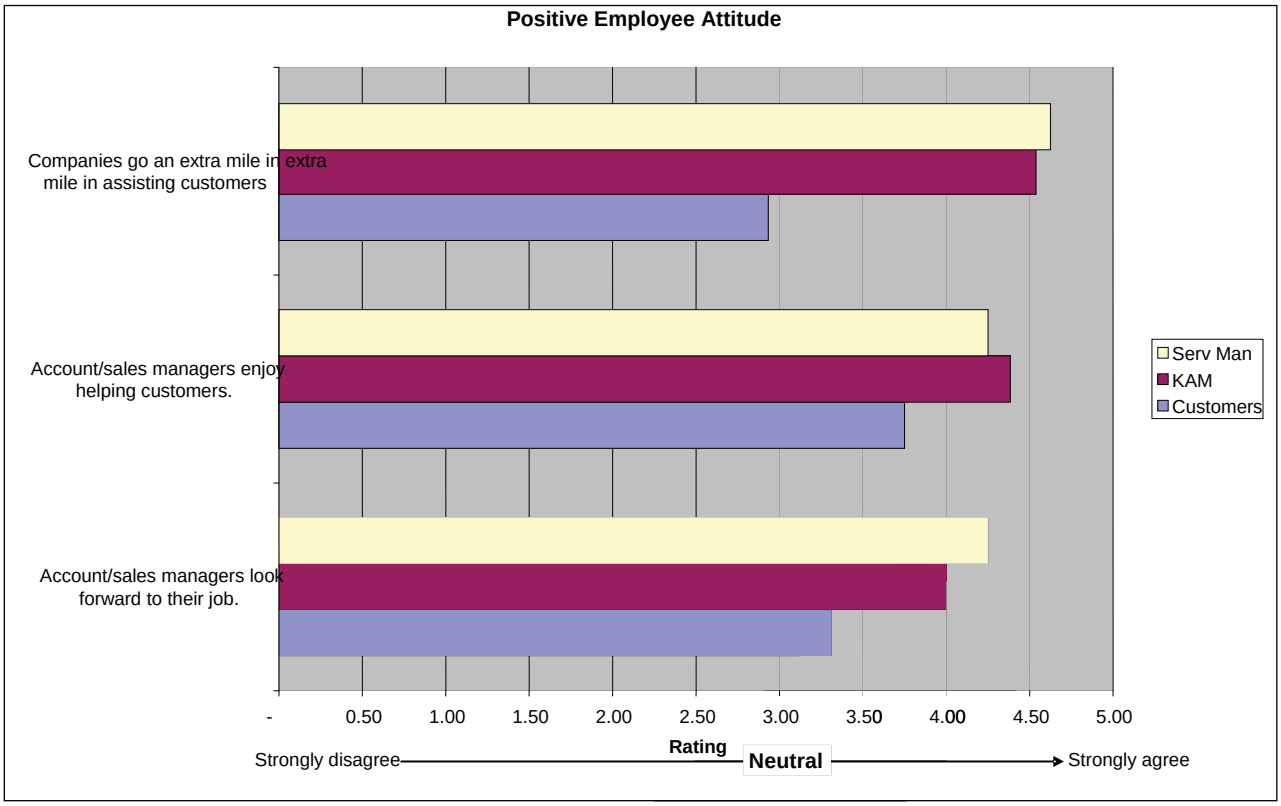

Figure 2 : Positive Employee Attitudes

Three questions were asked on this section. The two questions on positive employee attitude as perceived by customers, firstly on manufactures in steel industry going an extra mile in assisting customers and, managers and employees looking forward to their jobs were rated low by customers versus the rating by employees. As indicated in figure 2, only 31% of customers perceive that employees look forward to their jobs. Key account managers and service managers, 62% and 88% respectively look forward to their jobs. There is definitely a gap between the customer perception and that of employees.

c) Employee Empowerment

Employee empowerment is imperative in customer service environment, service employees must make decisions, take initiative, improvise in order to deal with and solve customer problems, and this is called service recovery. Unless employees are empowered improvisation and taking of initiatives will not happen. Figure 3 shows the results of question 4 in the questionnaire.

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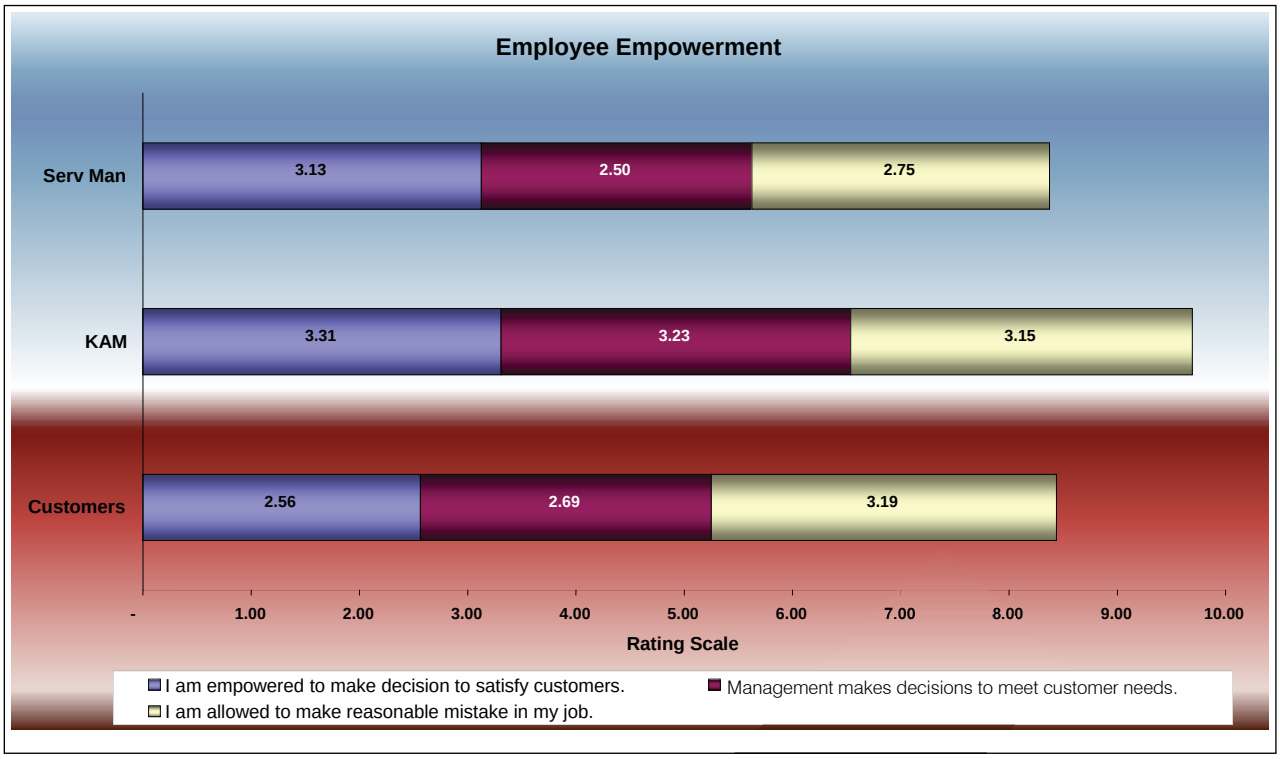

Figure 3 : Employee Empowerment

The results are indicated in figure 3. Three questions were asked in this section, one was that front line employees are empowered to make decisions to satisfy customers. This question was rated very poorly by customers a rating of 2.56 which means that customer say they disagree. It was equally rated low by employees with a rating of just above 3 which means they are undecided.

The question that management makes decisions to meet customer needs was also rated 2.50 by service managers, 3.23 by account/key account managers, and 2.6 by customers. And also the question that employees are allowed to make reasonable mistakes in their jobs was also rated poorly, a rating of 2.75 by service managers (disagree), rating of 3.15 by account managers and 3.19 by customers. There is clearly no level of empowerment on front line employees. One of the comments from customers is that "The frustration that is encountered that although our accounts manager understands our business he is not sufficiently empowered to make meaningful decisions"

d) Customer service culture

Customer service culture in the organisation is necessary to facilitate the front line service providers to deliver a commendable service to customers. Sadri & Lees (2001) in Liebenberg and Barnes (2004) in 4.3.4 above argued that in their opinion that culture not only determines the success or failure of the organisation, but that a positive culture can be a competitive advantage over competing firms or organisations. It is therefore important that the organisation has a positive customer service culture as this could affect its success in the marketplace (see figure 4.)

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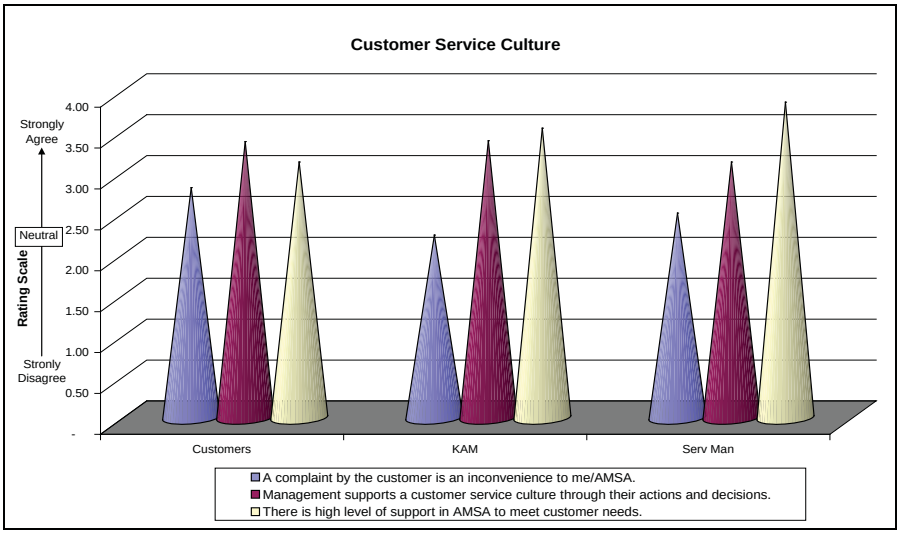

Figure 4 : Customer service culture

Figure 4 shows the results of respondents on question 5 of the questionnaire, customer service culture. The first question in this section was that a complaint by the customer is an inconvenience to me (employee). Customers tend to think that this statement is true as well as service managers, although the rating is low. Account managers seem not to agree with an average rating of 2. The question on management supporting the customer service culture through their actions and decisions scored just over 3 rating by customers and account managers and less than 3 rating by service managers. Account/key account managers and customers groups seem neutral on this, whereas service managers disagree as depicted by a rating of just below 3.

The question that there is a high level of support in the manufactures to meet customer needs was rated below 3 by customers, which means that customers do not see the level of support necessary to meet their needs. Account managers and service managers however rated this question above 3 with service managers having a highest rating of 3.5. Management support could therefore be dependent on individual managers, which will therefore differ throughout the organisation. The fundamental answer is that provided by customers who do not see the high level of support in the company.

a) Management Factors

The interviews with management were aimed at getting a different perspective and also to verify information obtained from employees and customers. The questions asked are briefly discussed under each factor that was investigated as having an influence on customer service.

i. *Employee Motivation*

On the question asked whether sales managers believe that their sales team is motivated, the sales managers interviewed stated that there was instability in the team over the last eighteen months and that this affected staff morale and motivation. A lot of resignation including that of the general manager marketing resulted in insecurity and lack of motivation. They believe that with the structure completed and people in their positions there will be stability. One remarked as follows "I don't think that there are necessarily motivated, we come from the era where we were challenged as a company, country, universe, often as a company goes through a slump the impact is felt by the employees. No salary increase, loss of leave days".

ii. *Positive Employee Attitude*

Different views were expressed with regard to attitude, one sales manager felt that employees should not speak bad about the company because it filters into the market, they must be positive, other felt that it depends on personal profile, those account managers who has been with the company for a long time have nothing to prove and those who are fairly new do their utmost best to make a point.

iii. *Employee Empowerment*

All sales managers interviewed said they empower their employees by not wanting to get involved on day to day activities; however account managers must exercise discretion within the set boundaries. They all want to get involved in more strategic issues; however they conceded that certain issues will be elevated by customers when they do not get joy from account managers. This however seems to negate their good intentions. If account managers are sufficiently empowered, customers would not be escalating issues to management.

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iv. *Customer service culture*

Sales managers said the culture is not ideal, the company is fighting fires all the time and reactive, they should be proactive. One sales manager remarked that…. "We must rectify our attitude, we are arrogant, take it or leave it attitude. We don't treat them like customers". This certainly agrees with the responses from customers and front line staff as discussed above.

v. *Customer service improvement*

Sales managers were asked how they can improve customer service. The general theme was to know customers better, communicate more, and improve response time on customer queries, show that you care and be honest, and practice what we preach. One of the comments was …. "I think by understanding what our customers want and by improving on our delivery of what they want, we have been running business to suite our bottom line, we need to shift our focus a bit, not to forget it, if your customers are happy the bottom line will be taken care off".

VI. Conclusion and Recommendations

Customers and account/key account managers and service managers alike made their opinions on issues of customer service on the key themes identified. To a large extent there are similarities on how the steel manufactures are viewed to be dealing with some of the issues. The interviews held with sales managers as well gave indication of a company faced with a general lack of customer service culture. The views expressed by customers about the company or sales staff, such as arrogance, monopoly, and not listening to customer needs was also expressed by some of the sales managers interviewed.

a) Employee Motivation

The honesty with which account managers in particular expressed their lack of motivation is commendable, this was also expressed by customers and confirmed by sales managers. Although sales managers gave possible reasons for lack of motivation, i.e. recent problems with uncertainty and high turnover of senior managers in the sales and marketing departments, the problem does exist and needs to be addressed.

This can be addressed by:

- Organising a workshop by an external facilitator to discuss issues leading to lack of motivation from account/key account managers and service managers.
- Creating a motivating climate where there is effective management – leadership.
- And by creating a shared value system, this will create commitment to a set of principles guiding and directing work behaviour.

b) Employee Attitude

Attitude can be a personal or individual problem, but in an organisation where attitude is a problem, it can be so pronounced that it affects customer service, the problem can be deeper. Employee attitude can also be linked to other factors like customer service culture and rewards. Research results showed that there is a general lack of customer service culture at the steel manufactures, there can be pockets of excellence, but these seem to be overshadowed by the attitude of carelessness. The researchers recommend that:

- The basic understanding of the importance of customers to an organisation and what happens if there are no customer needs to be taught to all employees especially those who interact with customers.
- Management includes customer service in the balance score card as a key performance management measure so that there is change in employee attitude to a positive one that will help enhance customer service.

c) Employee Empowerment

Empowerment gives credibility to account managers and all employees dealing with customers. If account managers cannot make decisions and keep on referring issues to management, customers are likely not to take them seriously and this will lead to customers dealing directly with senior managers. Customers do understand the boundaries under which account managers operate, but a fair amount of latitude should be given to account managers to make decisions. This will also elevate them from being order takers to be order creators, they must be able to discuss customer business and see potential growth opportunities. Customers are likely to open up when their account manager is seen to be in control, and this control can best be seen if account/key account managers empowered which will also boost their confidence.

It is recommended that:

- Management encouraged to delegate and let account/key account managers take charge of customers' issues.
- Clear and relevant boundaries be set that will give account/key account managers autonomy on selected matters.

d) Customer service culture

Customer service culture is a bigger problem that cannot be confined to a sales and marketing department in an organisation. Although this culture manifest itself through the frontline employees dealing with customers, the roots of it needs to be traced back to the overall organisation. This could even point up to senior management and the way things are seen to be done by customers who have an advantage of dealing

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with all levels in the organisation. What could be recommended here is that management must foster a culture that recognises the importance of internal customers. The way internal customers do business with one another affects the way the company does business with the external customers. If the front line staff cannot get help from the internal customers, they will not be able to effectively and efficiently serve the external customer. There is goodwill among customers which the manufactures can use to improve their customer service culture and also change the perception in the market on their service levels.

VII. Concluding Remarks

This research study evaluated and established that factors like employee motivation, positive employee attitude, employee empowerment and customer service culture are some of the factors influencing customer service levels at manufactures SME of the steel industry researched.

This research was conducted to determine factors influencing customer service in the steel industry. It would be recommended that further research is conducted on internal customer service between departments, like production planning, quality management, and credit risk management.

The significance of the research is that for the first time, there is empirical evidence to prove that other than the core issues of product quality, on-time-delivery, and price there are other such as employee factors (which can be viewed as soft issues /factors) that have an influence on customer service of SME steel manufactures. If customer relationship and loyalty is important, then more attention must be given to these factors. For a company to have customer intimacy, more emphasis needs to be given to employee factors such as employee motivation, positive employee attitude, employee empowerment and customer service culture in the organization. Since this research was done based on manufactures with dominant positions in the steel industry, the employee factors identified are deemed to be influencing the customer service levels in the South African steel industry.

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A Multi-Level of Patient Safety Culture Effect on Safety Performance-The Case of Nurse

By Yi-Hsuan Lee & Cheng-Chia Yang
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Abstract - Past scales or studies on safety culture are mostly based on single-level measurement. This study established as a multi-level model of patient safety culture scale based on literature review to investigate the relationship among organization-level of patient safety culture, unit-level of patient safety culture and safety performance. This was a cross-sectional study, and distributed 705 questionnaires to nursing staffs in two regional hospitals. A total of 363 valid samples were returned; the valid return rate was 51.8%. Confirmatory factor analysis (CFA) was performed to test the factor structure. The construct composite reliability was significant, and factor loading was >0.5, thus indicating an acceptable model fit. Structure Equation Modeling (SEM) proved that the effect of organization-level of patient safety culture on individual safety performance is mediated by unit-level of patient safety culture.

Keywords : patient safety, safety culture, safety performance, multi-level of patient safety culture.

GJMBR-A Classification : JEL Code: 321201, 321299

A MULTI-LEVEL OF PATIENT SAFETY CULTURE EFFECT ON SAFETY PERFORMANCE-THE CASE OF NURSE

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A Multi-Level of Patient Safety Culture Effect on Safety Performance-The Case of Nurse

Yi-Hsuan Lee [α] & Cheng-Chia Yang [σ]

Abstract - Past scales or studies on safety culture are mostly based on single-level measurement. This study established as a multi-level model of patient safety culture scale based on literature review to investigate the relationship among organization-level of patient safety culture, unit-level of patient safety culture and safety performance. This was a cross-sectional study, and distributed 705 questionnaires to nursing staffs in two regional hospitals. A total of 363 valid samples were returned; the valid return rate was 51.8%. Confirmatory factor analysis (CFA) was performed to test the factor structure. The construct composite reliability was significant, and factor loading was >0.5, thus indicating an acceptable model fit. Structure Equation Modeling (SEM) proved that the effect of organization-level of patient safety culture on individual safety performance is mediated by unit-level of patient safety culture.

Keywords : patient safety, safety culture, safety performance, multi-level of patient safety culture.

I. Introduction

In recent years, patient safety has been concerned in medical care of different nations. Many researches have probed into the factors of medical safety, and found risks and negligence in current medical environment. In the past, little attention was paid to patient safety in medical industry. In 1991, a study by Harvard University reported that 3.7% of hospitalized patients had medical injury, 28% encountered medical negligence, and 76% of the cases were avoidable (Brennen et al., 1991). Baker et al.(2004) suggested that 3～16% of the patients in hospitals encountered adverse events and 28～51% of the cases could be avoided. Upon retrospective cases, these reports indicate the influences of adverse events on patients and health care system. Thus, medical injury cannot be neglected, and many countries have started initiating patient safety.

According to the report "To Err is Human" by the Institute of Medicine (IOM) in the U.S., it is estimated that there are at least 44,000～98,000 deaths are related to medical errors every year, and 53～58% medical injuries are avoidable medical errors. It suggested that health care organizations should develop safety culture, design organizational process and enhance credibility and safety care steps (Kohn, Corrigan and Donaldson, 2000). "An Organisation with a Memory" of the National Health Service of Britain in 2000 indicated that in 1999, there were 400 deaths related to medical negligence, and 10,000 people had physical or mental obstacles due to medical negligence (Department of Health, 2000). These two reports reveal that medical institutions should try to avoid system errors and human negligence, enhance safety culture, and health care safety by learning from accidental events.

Many countries have included patient safety as national policy. Since 2001, the Joint Commission on Accreditation of Healthcare Organization (JCAHO) has demanded hospitals to implement strategic plans of patient safety. The hospital administrations should be responsible for safety culture and prevention of medical errors (Kobs, 2001). In 2002, Health Canada stated that safety culture is an important role in enhancing patient safety (Baker and Norton, 2002). The report of Department of Health indicated that safety culture is critical to effectively learn from errors. Safety culture has positive influence on organizational performance, which demonstrates the importance of safety culture (Department of Health, 2000).

In recent years, many researches have developed scales to measure medical safety culture. Colla et al. (2005) compared the common scales on patient safety culture. Other researches also probed into current safety culture in health care facilities by these scales. For instance, Pronovost (2003) measured the commitment of Johns Hopkins Hospital to patient safety by SCS. Singer (2003) studied the difference of safety culture in 15 hospitals. Pronovost (2006) measured safety culture of intensive care unit by SAQ questionnaire.

Past scales or studies on safety culture are mostly based on single-level measurement. Zohar (2005) suggested that safety culture should be multilevel. Different units have different interpretations on organizational policy, and organizational and unit climates have mutual influence on each other. Medical industry involves the distinctness and profession. Priority of safety culture in different professional units in hospitals would be different. Information and regulation for personal safety behavior are from the units which undertake the organizational policy. This study intends to probe into the possible correlation between the three. The research purposes are below: propose multilevel

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scale on safety culture in medical industry, study the relationship between organization-level safety culture, unit-level safety culture and individual safety performance.

II. Theoretic Development

a) Safety Performance

Measurement on managers' safety monitoring and safety implementation performance is the critical factor of safety culture enhancement. Thus, organizations should construct measurement measures in developing overall safety culture process in order to evaluate the efficacy of organizational operation. Overall organizational performance must be measured by safety performance. However, there are various views on definition and scope of safety performance, and the constructs of safety performance are inconsistent.

Neal and Griffin (2000) divided safety performance factors into predisposing factors, determination factors and composite factors. Predisposing factors include individual and organizational factors; individual factors include: ability, experience and personality traits; organizational factors include: leadership, group regulations and organizational climate. Determination factors measure direct factors of difference of individual safety obedience and participation, and they include safety knowledge, safety skill and safety motivation. Composite factors are defined as safety system, step and personal-task behavior, including safety commitment, obedience and participation. Siu and Phillips (2004) divided safety performance into accidental events and occupational injury which is measured by self-report. Huang et al. (2006) studied manufacturing industry, construction industry, service industry and transportation industry, and divided safety performance into safety control and injury rate which is measured by self-report. Based on literature review above, the definition and constructs of safety performance differ according to the researchers' backgrounds; however, the literature mostly focuses on management system and behavioral constructs.

Traditional safety performance of organizations is measured by accidental frequency and severity rate. It is not based on specific standard, and it does not indicate if the management system is still under control (Petersen, 2000). Thus, some researches treat safety behavior model as a criterion to measure safety performance (Chhokar and Wallin, 1984).

Based on the above, this study defines safety performance as the evaluation on safety process of individual behavior. Upon the characteristics of medical industry, this study does not adopt inspection figures to avoid participants' resistance. The survey is based on anonymous questionnaires, and participants report their safety performance by self-report.

b) Safety Culture

Swuste (2008) suggested that the difference between safety culture and safety climate is not specifically defined. Many scholars have interpreted culture and climate differently; however, their definitions are similar. Zohar (1980) first defined safety climate as employees' overall perception of organizational characteristics and environment-related safety. The perception would be influenced by organizational system, policy and personal traits, and attitude; it would also influence organizational safety performance. Cox and Cox (1991) suggested that safety culture reflects employees' shared safety attitude, belief, perception and values. Schein (1992) defined safety climate as organizational climate and affection in contact between organizational members and external people. Moreover, safety climate appears before safety culture and safety culture is a kind of regular behavior. For instance, interaction, group rules, value of belief, philosophy, rules of games, climate, thinking habit, mental model, language model, share and consistent symbols could be treated as complexity of culture. Schein also assumed that climate is culture. Cooper (2000) indicated that safety culture is a sub-culture of the organization, and it would influence the members' attitude and behavior; it is also related to organizational safety performance. Moreover, safety climate, safety behavior and safety management influence each other, and form safety culture model which is influenced by interaction between personal psychology, situations and behavior. Common tools on personal psychology are measurement for belief, values, attitude and views, and are used for interviews with the employees. Behavior measurement is based on self-report. Situation is measured by observation or inspection through organizational policy, operational step, management system, and communication channels and process.

Zohar (2008) proposed multilevel model of safety culture to probe into roles of different levels in organizations on culture. Senior management develops and participates organizational policy and process, such as customer service, production quality and employee safety, as well as declares organizational policy and goals. However, successful implementation of policy relies on cooperation among senior, middle level and lower management. For instance, due to delayed production, lower management rushes the progress and violates the safety-oriented principle of senior management. Thus, it would result in low degree of safety climate. Such cases demonstrate the difference of organizational policy in different units. Traditional organizational climate is based on single-level analysis, and multilevel model distinguishes policy and practice. Senior management is responsible for policy planning, introduction process and transformation from policy into strategic instruction. Lower management is in charge of

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the execution. Thus, organization-level climate is to set up corporate strategy and senior management. With priority of safety in different units, group-level climate would influence unit members' behavior, and organization-level climate would influence group-level climate. For instance, when organization policy is production-oriented, and neglects safety record, lower management would concern more about production efficiency than safety inspection figures (Zohar, 2005).

Based on the above, this study probes into safety culture extended from climate, and defines safety culture as employees' perception of safety culture. The perception of organizational values on safety will influence the employees' values, attitude and cognition. It includes two levels: organization-level and unit-level safety culture. The researcher proposes the hypothesis below.

H1: Organization-level safety culture positively influences unit-level safety culture.

c) Relation between safety culture and safety performance

Zohar (1980) measured safety climate by quantitative study, and concluded eight constructs in the questionnaire: safety training, management's safety attitude, safety behavior, job environment risk, safety execution, situation of safety committee, safety communication and safety progress at work. Cox and Cox (1991) indicated five dimensions: safety attitude, responsibility, environmental safety, efficacy of management on safety and personal exemption. O`Toole (2002) studied correlation between organizational culture and employees' cognition of safety, and suggested that commitment to safety management, education and knowledge, safety monitoring process, employees' involvement and commitment are the factors to measure safety culture. Siu, Phillips and Leung (2004) investigated the relationship between safety climate and safety performance of construction workers, and divided safety climate into safety attitude and communication. They found that safety attitude would influence occupational injury. Katz-Navon et al. (2005) suggested that safety culture is the prediction factor of medical errors, and indicated a correlation between culture, safety practice and medical error frequency. Clarke and Ward (2006) suggested that safety climate is the mediating factor of leadership and safety participation. Huang et al. (2006) measured safety climate by four constructs: managers' support for safety, safety policy, safety training and safety management. They found that safety climate positively influences safety performance. Stock (2007) pointed out that safety culture promotion in medical institutions would enhance safety performance and reduce medical errors. There is also a positive correlation between safety culture and safety performance. Wu et al. (2007) defined safety culture as employees' perception of safety climate. The perception is influenced by organizational and individual factors, and it would further affect safety behavior and performance. Based on the above, this paper proposes the hypotheses below:

H2: Organization-level safety culture positively influences safety performance.

H3: Unit-level safety culture positively influences safety performance.

III. Research Method

a) Research tools and operational definitions of variables

This study refers to the scale of safety culture revised based on SCS, (Pronovost, 2003), PSCHO (Singer et al., 2003) and SAQ (Sexton et al., 2004) developed by foreign researches. Organization-level safety culture refers to employees' perceived organizational involvement in safety and commitment to safety, and it is measured by organizational management and commitment. Unit-level safety culture refers to employees' perceived unit's safety process planning and management. Communication, inspection management and accident management are used to describe individuals' perception of unit safety culture. Safety performance is to measure task-related behavior. Individual safety behavior is measured by safety obedience, safety participation and safety behavior based on Neal and Griffin (2000) and Singer et al. (2003). The questionnaire design is based on Likert 5-point scale, and modified according to expert review by five clinical and managerial experts. Finally, the formal questionnaire remained the original constructs, and included 38 items, including 15 items on organizational safety culture, 12 items on unit safety culture, and 11 items on safety performance.

b) Research subjects and sampling method

Since medical professional groups are diverse, the research subjects are the nurses of hospitals. Nurses are the front-line personnel to take care of patients, and they are the majority in hospitals. In 2006, ASHRM indicated that nurses are very important for enhancing patient safety culture (American Society for Healthcare Risk Management, 2006). In order to control interference of policy and system in hospitals, this study enrolled 414 (50.4%) and 291 (51%) nurses from two regional teaching hospitals of the same system as the subjects. Both hospitals passed the new hospital evaluation of Department of Health in 2006, and were rated as excellence. The hospitals provided the lists of all nurses, and the researchers distributed and retrieved questionnaires in the hospitals. The investigation lasted from April 1 to April 18, 2008. There were 705 questionnaires distributed, and 403 were returned. After eliminating questionnaires with contradictory and

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incomplete answers, there were 363 effective questionnaires and 40 invalid ones. The valid return rate was 51.8%.

IV. Results

a) Sample Description

In term of job position, most subjects are nurse practitioners (79.61%), followed by nurses (15.70%) and nurse specialists are the least (4.68%); regarding seniority, most have seniority of 5 ~10 years (26.72%), followed by over 10 years (25.34%), and new employees with less than 6 months are the least (2.47%); regarding their ages, most are 31~40 years old (33.3%); most of them work in regular wards (38.29%), followed by intensive care units (22.04%).

b) Reliability and validity analyses

The design of scale in this study is based on related literatures and experts' opinions. Thus, the questionnaire has certain degree of content validity. Exploratory Factor Analysis and Cronbach α analysis are applied to confirm the validity and reliability of the scales. According to result of factor analysis, this study selects factors with Kaiser>1, and eliminates factors with factor loading lower than 0.5 in order to enhance the explanatory power of the model. The reliability of the scales is over 0.7. As shown in Table 1, the constructs are analyzed by confirmatory factor analysis to ensure the degree of single construct characteristic. Finding shows that preliminary fit of models are acceptable ($\chi 2/df=1.9$, GFI=0.87, RMR=0.04, PNFI=0.79, PGFI=0.74, IFI=CFI=0.94, TLI=0.93 and RMSEA= 0.05). Regarding overall model, except for GFI=0.87 which is not significant, all other measures are acceptable, indicating goodness of fit of the constructs.

Table 1 : Research Framework for the Result of Confirmatory Factor Analysis (CFA)

Factors	Item	Mean	Load	SE	SMC	CR	AVE	α value
Organizational management	OC1	4.19	0.61	0.26	0.37	0.93	0.68	0.78
	OC2	3.76	0.56	0.40	0.31			
	OC5	3.96	0.78	0.17	0.61			
	OC6	3.76	0.83	0.16	0.69			
	OC7	4.27	0.67	0.31	0.45			
	OC8	4.06	0.72	0.28	0.52			
	OC9	4.29	0.81	0.15	0.66			
Organizational commitment	OC13	3.99	0.84	0.17	0.71	0.91	0.77	0.85
	OC14	3.84	0.90	0.14	0.80			
	OC15	3.76	0.72	0.30	0.51			
Communication	UC1	3.56	0.89	0.13	0.79	0.86	0.80	0.79
	UC2	3.69	0.80	0.19	0.63			
	UC4	3.67	0.57	0.48	0.32			
Inspection management	UC5	4.10	0.77	0.19	0.60	0.92	0.75	0.85
	UC6	4.14	0.84	0.16	0.71			
	UC7	4.07	0.78	0.24	0.61			
	UC8	4.22	0.71	0.21	0.50			
Accident management	UC9	4.19	0.76	0.20	0.57	0.90	0.82	0.86
	UC10	4.15	0.86	0.14	0.73			
	UC11	4.17	0.87	0.11	0.76			
Safety behavior	SP3	4.15	0.59	0.45	0.35	0.64	0.51	0.71
	SP4	3.67	0.80	0.40	0.64			
	SP5	3.66	0.52	0.37	0.27			
Safety participation	SP6	3.79	0.62	0.61	0.38	0.75	0.51	0.72
	SP7	3.37	0.73	0.39	0.53			
	SP8	3.50	0.73	0.45	0.53			
Safety compliance	SP10	4.40	0.78	0.24	0.60	0.80	0.66	0.72
	SP11	4.33	0.73	0.33	0.53			

According to analysis of Bentler (1993) by normal loading, SMC and errors, CR of constructs is over 0.6, and AVE is over0.5, which indicates good construct validity. Regarding discriminant validity, correlation coefficients among constructs demonstrate the correlation. As shown in Table 2, Square maximum of pair correlation coefficient is 0.50 which is less than minimum VE (0.51) of constructs, and also meets the criteria suggested by Fornell and Larcker (1981).

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Table 2 : Descriptive Statistics and Intercorrelations between Measures in Dimensions

	1	2	3	4	5	6	7
2	0.67***						
3	0.71***	0.61***					
4	0.66***	0.57***	0.55***				
5	0.66***	0.50***	0.55***	0.71***			
6	0.13*	0.15*	0.12*	0.22**	0.14*		
7	0.34***	0.24***	0.34***	0.32***	0.22***	0.22***	
8	0.25***	0.19***	0.21***	0.35***	0.27***	0.32***	0.34***

1. Organization management 2. Organization commitment 3. Communication 4. Inspection management 5. Accident management 6. Safety behavior 7. Safety compliance 8. Safety participation
$*p < .05$, $**p < .01$, $***p < .001$

According to analytical results above, reliability, convergent and discriminant validity of constructs are acceptable. For estimating structural model by MLE, the number of samples should be 100~150. Bagozzi (1988) suggested that number of samples should be over 50, and five times of the estimated parameter. This study has 363 valid samples, which meets the requirement above.

The overall model fit of this study is measured by preliminary fit criteria; overall model fit and fit of internal structure of model. Preliminary fit measures are below: (1) measurement errors should be positive, (2) factor loading should be at least 0.5 or over 0.95, (3) meeting significance level. Result shows that part of measures of overall model fit (χ2/df=2.36, GFI=0.82, RMR=0.09, PNFI=0.72, PGFI=0.7, IFI= 0.87, CFI=0.87, RMSEA=0.06) are not acceptable. Path from organization-level safety culture to safety performance is insignificant, and thus, this study modifies the model and eliminates the path.

Measures of the modified model are acceptable. Regarding overall model fit measures (χ2/df=2.34, GFI=0.89, RMR=0.05, PNFI=0.76, PGFI=0.73, IFI=CFI=0.9, RMSEA=0.05), except for GFI which is insignificant, all other measures are acceptable. As to fit of internal structure of model, the finding shows that CR of latent variables is over 0.6 and AVE is over 0.5. Factor loading of constructs is over 0.5, indicating good fit of internal structure of this model. (Table 3).

Table 3 : Fully Mediated Path Model of Result

Dimensions/items	Factor Loading	T-value	SE	SMC	CR	AVE
Organization management					0.80	0.66
λ_{y11} OC1	0.61	-	0.26	0.37		
λ_{y12} OC2	0.56	9.15	0.40	0.31		
λ_{y13} OC3	0.78	11.94	0.18	0.61		
λ_{y16} OC6	0.83	12.30	0.16	0.69		
λ_{y17} OC7	0.66	11.65	0.31	0.45		
λ_{y18} OC8	0.71	11.75	0.28	0.51		
λ_{y19} OC9	0.82	13.06	0.15	0.66		
Organizational commitment					0.90	0.76
λ_{y113} OC13	0.82	-	0.17	0.71		
λ_{y114} OC14	0.88	20.44	0.14	0.80		
λ_{y115} OC15	0.69	14.76	0.30	0.51		
Communication					0.85	0.67
λ_{y21} UC1	0.87	-	0.13	0.79		
λ_{y22} UC2	0.77	18.27	0.19	0.63		
λ_{y24} UC4	0.53	11.34	0.48	0.32		

Dimensions/items	Factor loading	T-value	SE	SMC	CR	AVE
Inspection management					0.90	0.74
λ_{y25} UC5	0.75	-	0.19	0.57		
λ_{y26} UC6	0.82	16.82	0.16	0.67		
λ_{y27} UC7	0.76	15.27	0.24	0.58		
λ_{y28} UC8	0.69	13.94	0.21	0.47		

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Safety behavior					0.75	0.51
λ_{x33} SP3	0.51	-	0.45	0.27		
λ_{x34} SP4	0.79	6.25	0.40	0.62		
λ_{x35} SP5	0.55	6.86	0.30	0.31		
Safety participation					0.79	0.55
λ_{y36} SP6	0.61	-	0.30	0.38		
λ_{y37} SP7	0.72	9.48	0.35	0.52		
λ_{y38} SP8	0.72	8.77	0.50	0.52		
Safety compliance					0.80	0.67
λ_{y310} SP10	0.77	-	0.24	0.60		
λ_{y311} SP11	0.72	7.42	0.32	0.53		

As to organizational management of organization-level safety culture, team work training of the units to improve patient care performance and safety (λy112=0.83) is the most important factor. Although other coefficients are low, they are at least 0.5. The finding demonstrates that promotion of organizational management of safety culture in nursing should rely on a complete group care training model systematic evaluation. Regarding organizational commitment, senior management's creation of working atmosphere is the highest (λy114=0.88), followed senior management's consideration of patient safety in discussion of reform of current plans (λy113 =0.82). It demonstrates enhancement of employees' perception of cohesion in hospitals and senior leaders' commitment. When employees encounter medical disputes, the hospitals provide immediate support and commitment for nurses, and senior management creates a safety culture. Senior management supports employees directly, and introduces organizational strategies in patient safety, such as aims, core value and tasks of hospitals, in order to enhance the creation of safety culture.

Regarding communication of unit-level safety culture, perception of proper channels to reflect patient safety is the most important (λy21 =0.87). It shows that communication of unit-level safety culture should rely on complete reporting channels to allow front-line nurses to immediately discover the problems and report them successfully in order to enhance safety culture. Regarding inspection management, unit supervisors' regular monitoring and inspection of progress of patient safety (λy26 =0.82) is the core factor. The finding suggests that as to inspection management, the units should set up safety inspection regulations and regularly conduct evaluation management. Moreover, the units should improve the abnormal inspection. Regarding accident management, supervisors will introduce the causes and results to employees in order to prevent the accidents (λy211=0.86); secondly, the supervisors will actively investigate the causes, clarify responsibilities and analyze the causes (λy210 =0.84). As to accident investigation management, it is important to probe into the causes, improve them, and share the results. In order to enhance unit-level safety culture, reporting system and systematic management of abnormal events are the priority. In addition, unit supervisors' concrete regulations on responsibilities and duties of different levels on safety indicated by organization and regular announcement of safety policy will enhance safety system.

Regarding safety behavior in safety performance, when staffs violate the patient safety polices, other staffs usually do not report the minor cases in order to maintain the colleague relationship (λx34 =0.79). Although other coefficients are low, they are at least 0.5. Regarding safety participation, attention to new knowledge to enhance patient safety or reduce medical errors (y37 =0.72) and proposal to direct supervisors when having ideas or opinions to enhance patient safety (y38 =0.72) are core factors. Regarding safety obedience, when treating or caring for patients, employees' active communication and identifying patients' identity with at least two measures (λx310=0.77) and implementation of important items of work units and rotation (λy311 =0.72) are important.

Hypotheses of this study are significant. Organization-level safety culture (γ11=0.96) positively influences unit-level safety culture. It means that higher value of organization on safety culture has more positive influence on unit supervisors' creation and effect of safety culture. Unit-level safety culture (γ13=0.55) positively influences safety performance, indicating hat higher safety culture will more positively influence employees' task-related safety behavior. Hypothesis of organization-level safety culture on safety performance is insignificant. However, according to the path, organization-level safety culture indirectly influences safety performance by unit-level safety culture. Indirect effect is 0.53. The result shows that unit-level safety culture is the mediating variable between organization-level safety culture and safety performance.

V. Conclusions

a) *Research Implications*

This empirical study probes into to critical issues:

1) This study applies the multilevel scale on safety culture in medical industry, and probes into the correlation among organization-level safety culture, unit-level safety culture and individual safety performance. Different from past researches on

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safety culture upon single level analysis, this study divides safety culture into organization and unit levels, and distinguishes the professional groups, reduce variance of professional cognition in different units. The subjects of this study are nurses who frequently care for patients. According to the fitness test, the overall model fit is acceptable. It means that scale and theoretical model of this study are supported, and there are causal relations among constructs.

2) Safety culture formation influences execution results by variance of different levels. This study finds that unit climate, as compared to organizational safety climate, is more influential on employees' safety behavior. It shows that single level analysis is not suitable for evaluation of safety culture. Although senior management values and promotes safety, lower management' implementation of safety policy and information communication will influence the unit members differently. Influence of lower management is the most significant. Past researches on social cognition suggested that with the same information, the individuals would have different cognitions (Hamilton and Sherman, 1996). When the individuals receive new information, they would modify the previous judgment (Bodenhausen, 1987). Thus, the policy passed from top to the bottom will rely on lower management's execution of policy and process, which would result in a kind of interpersonal network of social interaction. Lower management's policy execution will moderate the final implementation result. In the process of top-down passage pf policy, the same policy would be changed, and result in employees' inconsistency of information in organization. Thus, analysis on safety culture formation should be based on different levels.

b) Practical Implications

Currently, safety culture in medical industry of Taiwan is still at the stage of promotion, and the culture has not been embedded in employees' daily jobs. In the past, due to inequality between medical patriarchy and information, patients usually passively receive the medical personnel's information, which results in different cognitions. Moreover, with professional division of work and busy clinical routines, it is difficult for the units to communicate and negotiate with each other, thus leading to many medical disputes. However, in recent years, patients' rights have been concerned, and more attention has been paid to patient safety. Since 2004, the Department of Health has actively promoted patient safety, and annually announced "objectives of patient safety" of hospitals as direction of policy. Since 2006, hospital evaluation system in Taiwan has regulated patients' rights and patient safety in hospitals. Thus, the researcher proposes the following suggestions:

1) To enhance internal communication channels and partners' problem-solving ability by justice and non-punishment culture. Since safety culture promotion in medical industry is set in relative late, the safety culture and system are incomplete during the initial stage, and nurses are usually uncertain about organizational systems and communication channels. They are even not used to reporting abnormal events since they worry about colleagues' blames and senior management's punishment. Thus, senior management and lower management should both emphasize the importance of safety by caring leadership and encouragement to involve safety issues in daily routines. By developing communication channels and demanding for safety job regulation and obedience, they can thus enhance safety culture. Regarding organizational system and communication, medical errors were regarded as individual responsibilities in the past. However, organizations should develop justice culture, and recognize the problems of overall system and process after the incidents. Independent investigation facilities can clarify causes and improve the system, and finally have feedback. The measures have been rooted in culture of aviation industry (Helmreich, 2000).

Thus, the organizations should set up complete reporting system, accident investigation, and smooth communication channels. In recent years, the Department of Health, Executive Yuan, has actively promoted reporting system of patient safety and even constructed Taiwan Patient-safety Reporting System to encourage the hospitals to report abnormal events, and construct exchange and learning platform. It aims to allow hospitals to learn from error reporting, and learn to improve and prevent the errors. IOM suggests that reporting system without punishment is the first step to construct safe medical system. The construction of organizational culture without punishment should be based on organizational system, such as constructing patient safety committee, investigating abnormal events by independent units and senior management as a committee to arbitrate the incidents. In the initial stage of promoting safety culture in hospitals, nurses are usually influenced by peer pressure or relationship. In order to root safety culture in jobs, the organizations should construct "justice culture", and recognize that the reporting aims to discover the problems in organizational process and managerial system, instead of attributing the problems to certain people. It will thus enhance safety behavior, successfully promote reporting system, and construct incident investigation. In addition, hospitals' setting of reporting system, incident dealing process and improvement, cross-unit

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improvement serious events and proposal of suggestions, sharing and learning of information, knowledge sharing and feedback, knowledge sharing channels and platform in the organizations, new knowledge patient care and construction of communication channels for employees' opinions on safety will significantly enhance overall safety performance.

2) Enhancing medial teams' shared educational training. The finding demonstrates that the nurses suggest that team work training is the key factor of safety culture. Medical care should be based on team work. In complicated care system, the work cannot be accomplished by a person. Patient safety will rely on the efforts of different professional teams. Traditional medical and nursing education lacks team work training courses. However, in many high-risk industries, there are various team trainings, such as crew resource management training in aviation industry. Past researches have helped medical personnel to recognize adverse events by crew resource management training, and improved communication related to patient safety (Grogan, 2004). For instance, Haller et al. (2008) suggested that medical teams upon team resource management would enhance safety culture. It is the aspect to be improved in safety culture enhancement of medical industry in Taiwan. Future organizations should design complete training model meeting medial, nursing and technical teams' demands, and set up training evaluation in order to fulfill actual medical care, enhance team efficacy and communication, and enhance safety culture.

3) Integrating shared objectives of patient safety, developing indices and long-term promotion of employees' capacity. Safety culture is based on employees' perceived safety priority. In order to enhance employees' cohesion and identification with the team, patient safety should be treated as annual strategic direction. Senior management should arrange patient safety plan with shared value, plans nurses' core capacity, enhances patient safety learning plan, and enhance common consensus education of policy introduction for head nurses. Organizational climate can be regarded as social cognition which is based on sense making activities (Zohar, 2005). In daily patients care, in the nurses' complicated work division and busy routines, the organization constructs sense-making activities and executes safety process and strategy. When senior management constantly promotes patient safety, the nurses repetitively face adverse events in patient safety, thus resulting in low safety climate. The organization should evaluate the units with low safety climate, and solve and discuss adverse events in complicated situations in morning meetings, regular conferences and quality control activities to lead to common consensus. Thus, the construction of patient safety management system, successful communication, passing of organizational vision and tasks, managers' commitment and recognition of relationship between personal and group performance will possibly enhance safety culture.

By questionnaire survey, this study proposes multilevel scale of safety culture in medical industry, and probes into relationship between organization-level safety culture, unit-level safety culture and personal safety performance. The questionnaire is designed according to domestic and foreign literatures. The constructs have good reliability and validity. The scale can be the proper tool to measure multilevel safety culture in medical industry. Future studies can conduct related study from different views and dimensions. The finding can serve as reference for policy setting to Department of Health and patient safety rating in new hospital evaluation.

Representative of samples in this study should be improved, and the samples cannot reveal overall situations in medical industry in Taiwan. However, hospitals in this study are rated as excellence in 2006 and they should be representative samples. This study only probe into the nurses, thus future studies can expand the subjects, and examine different levels of hospitals, different departments, units and nurses.

This study finds that unit safety culture, as compared to organizational safety culture, is more influential on safety behavior. Future studies can probe into the influence of different variance relationship between leaders and subordinates in different medical groups on safety attitude and behavior. Social teams in Chinese and Western societies are different. For instance, Western society values rights and duties of groups. However, Chinese society believes in the concept of hierarchy upon the Confucian culture, and the interaction between supervisors and subordinates are based on Vertical Dyad Linkage Model (Graen et al., 1982). After developing the scope in and out of the groups in organizations, researches can further explore whether the nurses led by head nurses in lower organizational relationship follow safety regulations. When head nurses treat safety as priority, will unit nurses' safety behavior be influenced in supervisor-subordinate relationship? In higher organizational relationship, when nurses witness head nurses' voilation of patient safety, will the nurses report the adverse events or will they conceal the head nurses' errors for social exchange and mutual benefit. It will be the aspect for further study.

Future studies can focus on influence of nursing supervisors' leadership on safety culture and safety

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behavior, probe into the effects of senior management, middle-level management and lower management on nurses, and examine the influence of Charismatic Leadership and Paternalistic Leadership on subordinates' common consensus of safety.

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How the Default Probability is Defined by the Credit Portfolio Models: A Comparative Analysis Between the Theoretical Structural Models?

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Abstract - This paper is elaborate of which the main is to present a theoretical analysis between the structural models. There are currently three types of models to consider the risk of credit: the structural models (The KMV Moody's model and the CreditMetrics model) also defined by the models of the value of the firm, reduced form models also defined by models with intensity (actuarial models) and the econometric models (The macro-factors models). The development of its three types of models is based on a theoretical basis developed by several researchers and many financial institutions. These models are dedicated to measurement the default probability of credit portfolio. The evaluation of their default frequencies and the size of the credit portfolio are expressed as functions of macro-economic and micro-economic conditions as well as unobservable credit risk factors, which explained by other factors. We developed three sections to explain the different characteristics of the structural models of credit portfolio management. The purpose of all its models is to express the probability of default.

Keywords : risk management; credit risk; default probability; structural models; kmv model; creditmetrics model.

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How the Default Probability is Defined by the Credit Portfolio Models: A Comparative Analysis Between the Theoretical Structural Models?

Abdelkader Derbali [α] & Slaheddine Hallara [σ]

Abstract - This paper is elaborate of which the main is to present a theoretical analysis between the structural models. There are currently three types of models to consider the risk of credit: the structural models (The KMV Moody's model and the CreditMetrics model) also defined by the models of the value of the firm, reduced form models also defined by models with intensity (actuarial models) and the econometric models (The macro-factors models). The development of its three types of models is based on a theoretical basis developed by several researchers and many financial institutions. These models are dedicated to measurement the default probability of credit portfolio. The evaluation of their default frequencies and the size of the credit portfolio are expressed as functions of macro-economic and micro-economic conditions as well as unobservable credit risk factors, which explained by other factors. We developed three sections to explain the different characteristics of the structural models of credit portfolio management. The purpose of all its models is to express the probability of default.

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I. Introduction

The problem of evaluation of the failure probability of any borrower was the center of the bankers as soon as they began to lend some money. The quantitative modeling of the credit risk for a debtor is rather recent in fact. Besides, the modeling of the credit risk associated with instruments of a portfolio of credit such as, the loans, the pledges, the guarantees and the by-products (who constitute a recent concept).

A certain number of models were developed, including at the same time the applications of property developed for the internal custom by the financial institutions, and the applications intended for the sale or for the distribution *(Hickman and Koyluoglu, 1999*).

The big financial institutions recognize his necessity, but there is a variety of approaches and rival methods. There are three types of models of credit portfolio in the course of use at present *(Crouhy et al., 2000).*

- The structural models: there are two models of management of credit portfolio who are supplied in the literature: Moody's KMV model (Portfolio Model) and CreditMetrics model by JPMorgan.
- The Macro-factors model (Econometric model): The Credit Portfolio View model introduces in 1998 by Mckinsey.
- The actuarial models CSFP (Credit Suisse First Boston): this model (CreditRisk+) is developed in 1997.

The main idea for this study is to answer the question follows: *Haw the default probability is defined by the credit portfolio models?*

Then, the organization of this paper is as follows. In section 1, we present the main idea of the structural models and we define the forces and the weaknesses of each model. We provide the presentation of the KMV models and we define those forces and the weaknesses in section 2. The section 3 is considered to present the development of the Credit Metrics models and define those forces and the weaknesses. The final section is our conclusion.

II. What are the Structural Models?

The structural models of management of credit portfolio were presented by *Merton (1974) and then, developed by Leland (1994), Leland and Toft (1996), Anderson and Sundaresan (1996) and Jarrow (2011).*

The characteristics to define a structural model are given by two conditions:

- The process of management of the assets of the company has to be known on the market in which this one operates.
- The structure of the liabilities of the company has to be known by all the actors operating on the market of this one.

In the practice, to examine the models of management of credit portfolio, it is necessary to use parameters estimated implicitly because the values of

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the assets of the company are not observable. Nevertheless, the majority of the empirical evidence does not retain the structural models. The implicit prices obtained from the structural models does not seem to match the structure of maturity of the efficiencies on the assets of the company *(Eom et al., 2004; Ericsson and Reneby, 2005; Jarrow et al., 2003; Schaefer and Strebulaev, 2008; Li and Wong, 2008; Jarrow, 2011)* and to allow the forecasts of defect of the borrowers *(Patel and Pereira, 2007; Bharath and Shumway, 2008).*

The analysis of the model of *Merton (1974)* shows that this one supposes that the value of the firm follows a process of distribution and the defect occurs when the value of the firm falls below the nominal value of the debt on the date of maturity of this one. In this respect, this model serves to determine a threshold of defect.

The development of Merton's model is made by adding the other variables such as; the interest rate *(Longstaff and Schwartz, 1995)*, the optimal permanent capital *(Leland and Toft, 1996)*, the variable time of the threshold of default *(Collin-Dufresne and Goldstein, 2001)*, the unfinished accounting information *(Duffie and Lando, 2001)* and the risk of the events of defect *(Driessen, 2005).*

The structural models are based on the theory of the options and the structure of the capital of the company *(Hamisultane, 2008)*. In this aligned, the bankruptcy of a company took place when the value of assets is situated below the value of its debt. The structural models or the models of the value of the firm are based on the approach of Merton (1974) which supposes that the failure of a company appears in case the market value of its assets is lower than a certain threshold of its debts.

Generally, the models of credit portfolio management resting on the approach of Merton are the model KMV (Kealhofer, McQuown and Vasicek) of Moody and the CreditMetrics model of JPMorgan (1997). The distinction between both structural models was described in the table below.

Table 1 : The comparison between the KMV model and the CreditMetrics model

The KMV approach	The CreditMetrics approach
▪ The conduct of the value of the asset. ▪ Companies are decomposed into systematic components and that no-systematic. ▪ The systematic risk is based on the industry and the country of debtor. ▪ The correlation of defect ensues from the correlation of assets.	▪ The indication of own capital. ▪ Companies are decomposed systematic components and that no-systematic. ▪ The systematic risk is based on the industry and the country of debtor and can be sensitive to the size of the asset. ▪ The correlation of the defect ensues from the correlation of the efficiencies on own capital.

Source : Smithson (2003)

The structural models are also called models of the asset volatility. The Structural aspect of the models comes because there is a historical story behind by default that is something manages to start by default. The structural models are rooted in the knowledge of Merton. In Merton's model, the correlation of defect has to be a function of correlation of assets. The estimation of a structural model requires the implementation of the market value of the assets of the company and its volatility.

In the practice, the value of assets and their volatility are not observable for the most part of companies. The structural models lean strongly on the existence of assets quoted on the stock exchange so that we can estimate the necessary parameters.

III. The Kmv Model

The KMV model of credit portfolio management was elaborated for the first time in 1993. This model allowed the development of several models of quantification of the credit risk: Credit Monitor, Credit Edge and Private Firm Model for the individual credit risk and Portfolio Manager for the credit risk of a portfolio.

The model KMV rests bases on the notion of default distance which is calculated by basing itself on the barrier which engages the defect. As soon as, the distance in the defect is calculated, it transformed into the probability of failure (Expected Default Frequency: EDF).

The KMV model which was developed by the Moody's-KMV company is based on the theory of the prices of Merton options. It is about an abstract frame used to estimate the default probability of a company. The KMV model supposes that the company is in situation of defect when the value of its asset is less than the value of its debts. The Figure 1 explains the relation between the estimated own capital and the value of the asset. According to Merton's basic idea, in the KMV model the value of the own capital of the company is considered as being an option to buy. So, the value of the asset is considered as being the underlying asset and the debt represents the price of exercise *(Chen et al., 2010).*

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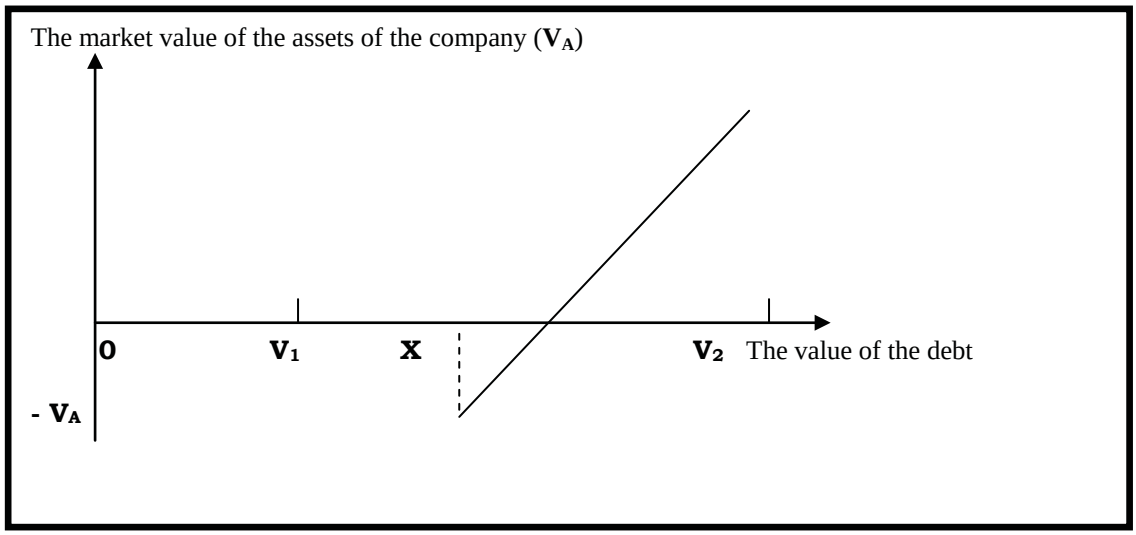

Figure 1 : The relation between the market value of the assets of the company and the value of the debt (*Merton, 1974)*

In the Figure 1, VA indicates the initial investment of the shareholders of the company; X indicates the point of default which corresponds to the sum of the long-term debt and half of the current liabilities. When the value of assets (VA) is superior to the debt (X), the shareholders will choose to gain profits staying after payment of the debts (VA - X) and these will be chosen by default, what is shaped with a net value raised in the Figure 1. In this case, the investor executes the option to buy.

So, if the value of assets is lower than the debt (VA < X), the shareholders will choose by default the transfer of the active total for the benefit of the creditors, what is coherent with a constant value of own capital indicated in the Figure 1, and it means that the option to buy is not executed *(Caouandte et al., 1998; Kealhofer and Bohn, 2001; Saunders and Allen, 2002; Bohn and Crosbie, 2003).*

Generally speaking, the shareholders receive Max (VA - X, 0) in the date of maturity T. According to Merton's model, the evolution of the market value of the assets of the company follows a process of geometrical distribution of the following shape:

$$\frac{dV_A}{V_A} = \mu\, dt + \sigma_A\, dW_t$$

Where W_tthe process of Wiener Standard is, μ is the average of the efficiency of assets and σ_A is the standard deviation of the efficiency on assets. The market value of the company is given by basing itself on the purchase price of a European option to buy supplies by Black and Scholes (1973).

$$V_E = V_A N(d_1) - e^{-rT} X N(d_2)$$

Where N(.) Indicate the function of distribution of the normal law with (Huang and Yu, 2010):

$$\begin{cases} d_1 = \dfrac{(ln\left(\dfrac{V_A}{X}\right) + \left(r + \dfrac{1}{2}\sigma_A^2\right)T)}{\sigma_A\sqrt{T}} = \dfrac{1}{\sigma_A\sqrt{T}}(ln\left(\dfrac{V_A}{X}\right) + \left(r + \dfrac{1}{2}\sigma_A^2\right)T) \\ d_2 = \dfrac{(ln\left(\dfrac{V_A}{X}\right) + \left(r - \dfrac{1}{2}\sigma_A^2\right)T)}{\sigma_A\sqrt{T}} = d_1 - \sigma_A\sqrt{T} \end{cases}$$

In the KMV model, there is a hypothesis which rests on the structure of the capital of the company. So, this capital has to consist only by actions, current liabilities and in the long term and convertible prices. Really, the value of the company V_A and the volatility of assets σ_A are not observable (Hull, 1997; Chen et al. 2010). We are going to deduct these two values by using the values of the options V_E.

So land us note that: $V_E = f(V_A, \sigma_A, X, c, r)$

$$\sigma_E = g(V_A, \sigma_A, X, c, r)$$

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Where c is the coupon paid on the long-term debt, r is the interest rate without the risk and σ_E is the volatility of share prices.

By applying the Lemma of Itô to these two functions and by arranging the terms we obtain:

$$\sigma_E = \left(\frac{V_A}{V_E}\right)\frac{\partial V_E}{\partial V_A}\sigma_A$$

With: who is deducted from the equation which measures the value of the VE which is defined by the following expression:

$$V_E = V_A N(d_1) - e^{-rT} X N(d_2)$$

Thus:

$$\sigma_E = \left(\frac{V_A N(d_1)}{V_E}\right)\sigma_A$$

Further to this transformation, we obtain a system of equation to two unknowns V_A and σ_A :

$$\begin{cases} V_A N(d_1) - e^{-rT} X N(d_2) - V_E = 0 \\ \sigma_E V_E - V_A N(d_1)\sigma_A = 0 \end{cases}$$

If the expressions of V_A and σ_A are determined, then we can arrive at the writing of the following formulation of the distance of defect (DD):

$$DD = \frac{\ln\left(\frac{V_A}{X}\right) + \left(\mu - \frac{1}{2}\sigma_A^2\right)}{\sigma_A\sqrt{T}}$$

According to the KMV model the distance of defect is defined in the following way (*Crosbie and Bohn, 2003):*

$$DD = \frac{V_A - X}{\sigma_A V_A}$$

From the distance of defect, we can deduct the value of the default probability as follows:

$$P_{KMV} = Prob\{V_A(T) < X\} = N\left(-\frac{ln\left(\frac{V_A}{X}\right) + \left(\mu - \frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}}\right) = N(-DD)$$

Then we can obtain the frequency planned by default (Expected Default Frequency: EDF) such as:

$$EDF = N(-DD)$$

However, the default probability does not correspond to the normal law. KMV Company tries to obtain the empirical value of the EDF rather than the theoretical value of the models *(Zheng, 2005).*

Fortunately, KMV Company possesses an enormous base of historical data concerning the default of the companies. By basing itself on these data KMV defined tables which associate with the various possible values of the distance of default (DD) on a temporal horizon considered a default probability definite and noticed empirically.

So, to protect itself against the risk which results from potential losses bound to the evolutions of the portfolio, *Kealhofer, McQuown and Vasicek (1993)* based on the determination of a random size L relative to the losses of the portfolio which is defined in a general way and on a horizon H as follows:

$$L = V_{\frac{H}{ND}} - V_H$$

Where $V_{\frac{H}{ND}}$ indicates the value of the portfolio *H* in the absence of the losses and V_H indicates the market value of the portfolio *H*. The development follows by KMV shows us that the distribution of *L* can be approached by an inverse normal distribution.

Table 2 : The forces and the weaknesses relative to the KMV model

The forces	The weaknesses
▪ The default probability is connected with the information of the market. ▪ Contrary to CreditMetrics models and CreditRisk+ models the debtors are specific. We can distinguish them by basing itself on their default probability, on their own structure of capital and on their own	▪ A hypothesis which is not realistic because she supposes that the debt of the company consists by bonds with zero-coupon and shares. ▪ KMV supposes that the price of assets follows one moment Geometric Brownian. This modeling by a continuous process excludes all the early defaults.

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assets. ▪ The threshold of defect is determined in an empirical way.	▪ This method is difficult because it depend a several data which are in most of the time unobservable or with difficulty accessible. ▪ The interest rate is supposed constant.

Source : Hamisultane (2008)

IV. The Creditmetrics Model

CreditMetrics was thrown for the first time in 1997 by JP Morgan's bank. CreditMetrics is considered as being an evaluation tool, for a portfolio, its variance of the values provoked by the changes of the quality of credit of the transmitter of the bonds (the credit migration) and leaves the defect of the counterpart. Unlike the approaches developed by the other models of management of a portfolio of credit, the probability of default in CreditMetrics is given by rating agencies for the big companies and by methods of scoring and mapping for small and medium-sized firms *(Paleologo et al., 2010).*

CreditMetrics belongs to the structural models since it rests on the model of *Merton (1974)* for the definition of the thresholds of the migration of credit (*Jarrow, 2011*). According to *Hamisultane (2008),* CreditMetrics makes it possible to calculate CreditVaR of a portfolio. The methodology of this model is based on the probability of moving of a quality of credit to the other in a given horizon of time (analysis of the migration of credit). The calculation of CreditVaR by CreditMetrics rests on the four stages following *(Crouhy et al., 2000; Hamisultane, 2008):*

- Determination of the risk isolated from each credit of the portfolio.
- The construction of the matrix of the probabilities of transition from a notation to another.
- The valuation of the assets of the portfolio according to the scenarios of transition from a notation to the other one.
- The calculation of CreditVaR.

The evaluation of a portfolio Value-at-Risk due to the credit (CreditVaR) by CreditMetrics is given the following Figure 2 (Crouhy et al., 2000):

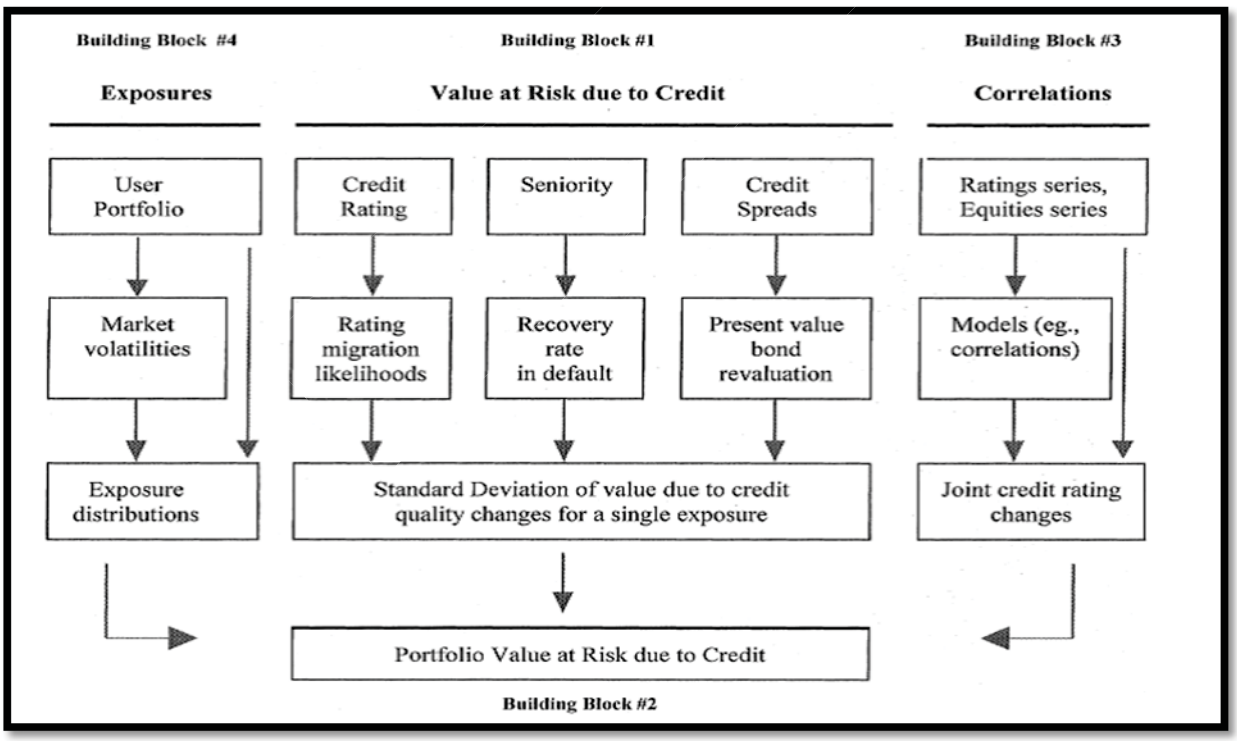

Figure 2 : The evaluation of a portfolio

In the model CreditMetrics, there are three categories of estimation to be used according to the nature of the composition of the portfolio. We are going to try, in what follows, to present the various principles of the model according to the composition of the portfolio.

a) The portfolio in an obligation

According to *Hamisultane (2008),* the system of rating used by CreditMetrics is the one rating agency. So, the broadcasting issuers of debt securities are noted according to a ladder of seven categories going

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from AAA to CCC according to the financial solidity of every company (*Crouhy et al., 2000).* The notation AAA is tuned to the healthy companies financially whereas those who are characterized by a bad financial situation are noted by CCC.

The notations offered by the agencies of rating are regularly published. These notations present information relative to the broadcasting issuers of debt securities. The agencies of rating include these notations in indicating tables, either the rate of historic default of broadcasting issuers according to their notation on a horizon of well determined time, or the evolutions of these notations in the time. These tables recapitulating the notations tuned to the broadcasting issuers of debt securities are defined by "the matrices of transition".

The matrices of annual transition summarize all the changes of notation, on a horizon of time of one year, of a sand of broadcasting issuers is presented as follows:

Table 3 : Transition matrix: Probabilities of credit rating migrating from one rating quality to another, within 1 year

Rating	AAA	AA	A	BBB	BB	B	CCC	Default
AAA	90.81%	8.33%	0.68%	0.06%	0.12%	0.00%	0.00%	0.00%
AA	0.70%	90.65%	7.79%	0.64%	0.06%	0.14%	0.02%	0.00%
A	0.09%	2.27%	91.05%	5.52%	0.74%	0.26%	0.01%	0.06%
BBB	*0.02%*	*0.33%*	*5.95%*	*86.93%*	*5.30%*	*1.17%*	*0.12%*	*0.18%*
BB	0.02%	0.14%	0.67%	7.73%	80.53%	8.84%	1.00%	1.06%
B	0.00%	0.11%	0.24%	0.43%	6.48%	83.46%	4.08%	5.20%
CCC	0.22%	0.00%	0.22%	1.30%	2.38%	5.00%	64.85%	19.79%
Default	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00%	100%

Source : Standard & Poor's CreditWeek (1996)

According to *Grundke (2009)*, this table must be carefully analyzed. So, by taking as an example the line corresponding to the BBB rating presented in the table above, we can deduct the probability of default as follows:

Table 4 : The potential rating relative to the BBB rating

Initial rating	Potential rating in a one year	Probability
BBB	AAA	0.02%
	AA	0.33%
	A	5.95%
	BBB	86.93%
	BB	5.30%
	B	1.17%
	CCC	0.12%
	D	0.18%
	Total	100.00%

Source : Grundke (2009)

After a period of one year, and settling on the asset of initial notation BBB, we can deduct that the probability that this active rest BBB after a period of one year is 86,93 %, that to become AAA is 0,02 % and that to be lacking is 0,18 %.

The use of this model is based on three main hypotheses *(JP Morgan and Co. Inc, 1997; Glasserman and Li, 2005; Hamisultane, 2008; Grundke, 2009; Figlewski et al., 2012):*

- The absence of multiple transitions: for a horizon of time given the number of transitions is in most of a single transition.
- The stability of the matrix of transition in time: for every class of notation, two companies in different sectors or in different countries have the same probability to migrate from a notation to the other one.
- The matrix of transition is of type Markov: for period given the probability to migrate of a class of notation in another class is independent from what took place for the last periods. These hypotheses are emitted for the simplification of the calculations of the matrix of transition for the posterior periods.

CreditMetrics determines the current value of the bond by using the curve of the rates with zero coupons to proceed with the calculations of CreditVaR. In that case, the transmitter of debt securities is not in situation of bankruptcy. By continuing in the same context of analysis, that is the use of the notation BBB as the example, we can use the table of the Forward rates following:

Table 5 : One-year forward zero-curves for each credit rating (%)

Category	Year 1	Year 2	Year 3	Year 4
AAA	3.60	4.17	4.73	5.12
AA	3.65	4.22	4.78	5.17
A	3.72	4.32	4.93	5.32
BBB	4.10	4.67	5.25	5.63

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BB	5.55	6.02	6.78	7.27
B	6.05	7.02	8.03	8.52
CCC	15.5	15.02	14.03	13.52

Source : CreditMetrics, JP Morgan

We suppose in our case which a noted transmitter BBB has emitted a Bond for 100 Euro over 4 years with a rate without annual risk of 6 %. The current value of the bond is given by the equation below:

$$\boldsymbol{V} = 6 + \frac{6}{(1+4.1\%)} + \frac{6}{(1+4.67\%)^2} + \frac{6}{(1+5.25\%)^3} + \frac{106}{(1+5.63\%)^4} = 107.55$$

By basing itself on the formula above, being able to us determine the various possible values of fire of type BBB according to his possible migrations towards other notations *(Crouhy et al., 2000; Hamisultane, 2008)*. The possible values of a bond rated BBB according to the possible migrations are presented in the table 5.

In case the company had a bankruptcy, the value of the bond is determined by using the average recovery ratio calculated by CreditMetrics on historical data *(Carty and Lieberman, 1996; Gordy, 1998).*

Further to the representative table of the various values of BBB according to the possible migrations, we can subtract the distribution of the variations of the price of the obligation in the following table:

Table 6 : Distribution of the bond values, and changes in value of a BBB bond, in 1 year

Rating	Probability: p (%)	Price of the obligation(bond) V ($)	Difference with regard to V: ΔV	Difference with regard to the average μ	μ^2 * p (%)
AAA	0.02	109.37	1.82	2.28	0.0010
AA	0.33	109.19	1.64	2.10	0.0146
A	5.95	108.66	1.11	1.57	0.1474
BBB	86.93	107.55	0	0.46	0.1853
BB	5.30	102.02	-5.53	-5.06	1.3592
B	1.17	98.10	-9.45	-8.99	0.9446
C	0.12	83.64	-23.91	-23.45	0.6598
Default	0.18	51.13	-56.42	-55.96	5.6358
	Average =	107.09 ($)		Variance = Standard deviation =	8.9477 2.99 ($)

Source : CreditMetrics, JP Morgan

The analysis of this table shows that CreditVaR in 1 % (at a level of 99 % confidence) is equal to the last value of the variation of the value of the bond which corresponds to the notation CCC. Thus, CreditVaR is equal to -23.91.

b) The portfolio in two obligations

In the case of a portfolio consisted of two bands, the analysis is based on the level of correlation of the migrations. In fact, in a portfolio consisted of several assets the migrations of the various credits are correlated. CreditMetrics tries to estimate these correlations. As long, as there are no good data to be used. In that case, CreditMetrics used the correlations between the values of the assets of the broadcasting issuers of the credits which are approached by the correlations between the equity prices of these broadcasting issuers to calculate the correlations between the migrations of the credits *(Treacy and Carey, 2000; Altman and Rijken, 2004; Gordy and Howells, 2006; Xing et al., 2012).*

According to *Iscoe et al. (1999)*, to be able to divert the correlations of the migrations of the credits of the correlations of the values of assets, it is necessary to have a model linking the quality of a credit to the value of assets. The solution proposed by CreditMetrics is to use an extension of the model of *Merton (1974)* which incorporates the migrations of the credits. In this aligned, we suggest taking into account the probability of migration of a bond rated initially by BB. These probabilities are given by the following table:

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Table 7 : Transition matrix based on actual rating changes

Rating	Probability: p (%)	Price of the obligation(bond) V ($)	Difference with regard to V: ΔV	Difference with regard to the average μ	μ^2 * p (%)
AAA	0.02	109.37	1.82	2.28	0.0010
AA	0.33	109.19	1.64	2.10	0.0146
A	5.95	108.66	1.11	1.57	0.1474
BBB	86.93	107.55	0	0.46	0.1853
BB	5.30	102.02	-5.53	-5.06	1.3592
B	1.17	98.10	-9.45	-8.99	0.9446
C	0.12	83.64	-23.91	-23.45	0.6598
Default	0.18	51.13	-56.42	-55.96	5.6358
	Average =	107.09 ($)		*Variance = Standard deviation =*	8.9477 2.99 ($)

Source : CreditMetrics, JP Morgan

By basing itself on the model of *Merton (1974),* we can suppose that the efficiency on a bond modeled as follows:

$$r = \mu + \sigma\varepsilon$$

With: ε a term of error is such as $\varepsilon \sim N(0,1)$, μ is the average efficiency on the bond and σ is the standard deviation of the efficiencies of this bond. Then, the default probability of an issuer of the bond is given by the following expression:

$$Pr\{default\} = Pr\{r < Z_{Def}\} = Pr\{\mu + \sigma\varepsilon < Z_{Def}\}$$

Thus,

$$Pr\{default\} = Pr\{r < Z_{Def}\} = Pr\{\sigma\varepsilon < Z_{Def}\}$$

If μ=0

$$Pr\{default\} = \left\{\varepsilon < \frac{Z_{Def}}{\sigma}\right\} = \Phi\left(\frac{Z_{Def}}{\sigma}\right)$$

Where Φ indicates the cumulative function of the normal law.

By using the table above, we can establish the table according to who summarizes the distribution of the probability of migration affected in conformance with BB rating:

Table 8 : The distribution of the probability of migration of BB rating

Rating	Probability from the transition matrix (%)	Probability according to the asset value model
AAA	0.03	$1 - \Phi(Z_{AA}/\sigma)$
AA	0.14	$\Phi(Z_{AA}/\sigma) - \Phi(Z_A/\sigma)$
A	0.67	$\Phi(Z_A/\sigma) - \Phi(Z_{BBB}/\sigma)$
BBB	7.73	$\Phi(Z_{BBB}/\sigma) - \Phi(Z_{BB}/\sigma)$
BB	80.53	$\Phi(Z_{BB}/\sigma) - \Phi(Z_B/\sigma)$
B	8.84	$\Phi(Z_B/\sigma) - \Phi(Z_{CCC}/\sigma)$
CCC	1.00	$\Phi(Z_{CCC}/\sigma) - \Phi(Z_{Def}/\sigma)$
Default	1.06	$\Phi(Z_{Def}/\sigma)$

Source : Crouhy and al. (2000)

With, $1 - \Phi\left(\frac{Z_{AA}}{\sigma}\right)$ represent the probability so that the bond of BB rating can pass in the notation AAA and Z_{AA} indicates the threshold from which BB passes to A_{AA}.

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The transformation graphic of the data above is presented as follow:

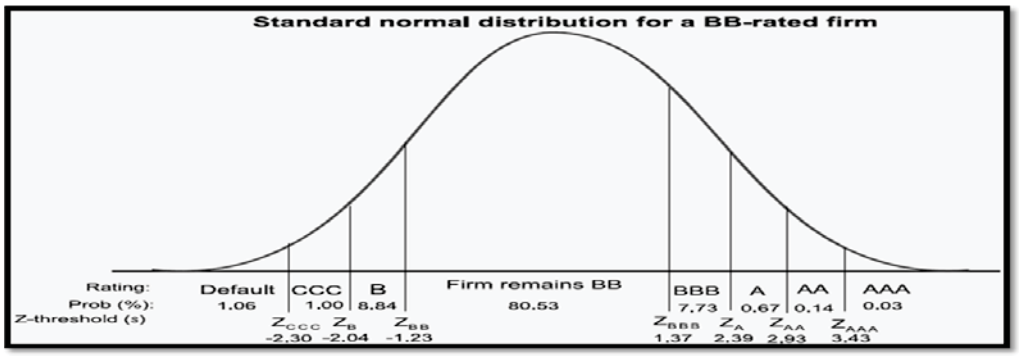

Figure 3 : Generalization of the Merton model to include rating changes (*Crouhy and al., 2000)*

Thus:

$$Z_{def}\sigma = \Phi^{-1}(1.06\%). \quad = -2.30$$

The values of the other thresholds are calculated according to whom corresponds itself aside type of the normal distribution of the random on the assets of the notation BB *(Gupton et al., 1997; Crouhy et al., 2000; Nickell et al., 2000; Bangia et al., 2002; Albanese and Chen, 2003; Albanese et al., 2003; Rosch, 2005; Feng et al., 2008).*

We suppose now, that a second issuer presents a rating A where the random on assets follow a normal distribution with a parameter σ^'. In that case, the values of thresholds relative for two bands who rated BB and A are presented as follows:

Table 9 : Transition probabilities and credit quality thresholds for BB and A rated obligors

Rating in 1 year	Rated-A obligor		Rated-BB obligor	
	Probabilities (%)	Thresholds: $Z_{(\sigma)}$	Probabilities (%)	Thresholds : $Z_{(\sigma)}$
AAA	0.09	3.12	0.03	3.43
AA	2.27	1.98	0.14	2.93
A	91.05	-1.51	0.67	2.39
BBB	5.52	-2.30	7.73	1.37
BB	0.74	-2.72	80.53	-1.23
B	0.26	-3.19	8.84	-2.04
CCC	0.01	-3.24	1.00	-2.30
Default	0.06		1.06	

Source: Crouhy and al. (2000)

By taking into account the table above, we can calculate the probability of migration joined in the following way:

$$P\left(Z_{BB} < r < Z_{BBB}, Z_A < r' < Z_{AA}\right) = \int_{Z_{BB}}^{Z_{BBB}} \int_{Z_A}^{Z_{AA}} f\left(r, r', \sigma, \sigma'\right) dr dr'$$

With *r* and *r'* indicate respectively the random on the assets who are rated by BB and A and f(r,r^',σ,σ') represent the joint density function by the Gaussian distribution which depends on the coefficient of correlation ρ.

The joint density function of the Gaussian distribution of two variables X and Y is presented by the form below:

$$f(x, y) = \frac{1}{2\pi\sigma_x\sigma_y\sqrt{1-\rho^2}} exp\left(-\frac{1}{2(1-\rho^2)}\left(\frac{x^2}{\sigma_x^2} + \frac{y^2}{\sigma_y^2} - \frac{2\rho xy}{\sigma_x\sigma_y}\right)\right)$$

According to *Hamisultane (2008)*, for ρ = 20% the matrix of joint transition which considers the correlation banding both entities BB and A is the following one:

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Table 10 : Joint rating probabilities (%) for BB and A rated obligors when correlation banding asset random is 20%

Rating of first company (BB)	Rating of second company (A)								
	AAA	*AA*	*A*	*BBB*	*BB*	*B*	*CCC*	*Default*	*Total*
AAA	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03
AA	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.14
A	0.00	0.04	0.61	0.01	0.00	0.00	0.00	0.00	0.67
BBB	0.02	0.35	7.10	0.20	0.02	0.01	0.00	0.00	7.69
BB	0.07	1.79	73.65	4.24	0.56	0.18	0.01	0.04	80.53
B	0.00	0.08	7.80	0.79	0.13	0.05	0.00	0.01	8.87
CCC	0.00	0.01	0.85	0.11	0.02	0.01	0.00	0.00	1.00
Default	0.00	0.01	0.90	0.13	0.02	0.01	0.00	0.00	1.07
Total	0.09	2.29	91.06	5.48	0.75	0.26	0.01	0.06	100

Source : CreditMetrics, JP Morgan (Lucas, 1995)

The last column of the table and the last line of this one represent the marginal probability for the entities BB and A which are equal to the sum of the joint probability by line or by the column. According to *Crouhy and al. (2000)* these marginal probabilities correspond to the probability of migration of BB and of A taken individually. The variation of the portfolio of both bands is calculated for each of the joint probability *(Brady and Bos, 2002; Brady and al., 2003).*

c) The portfolio in several obligations

In case the portfolio consists further more than 2 bands calculates its joint probability will more be complicated. So, model CreditMetrics propose the use of the simulations of Monte Carlo and the decomposition of Cholesky to generate trajectories correlated to the bond and build the distribution of the values of the portfolio on certain horizon of time *(Gouriéroux and Monfort, 1995; Fishmen, 1997; Crouhy et al., 2000; Hamilton et al., 2002).*

According to *Hamisultane (2008)* and *Feng et al. (2008)*, to generate trajectories correlated to the variables which follow a normal distribution N (μ,$\sum$). The determination of these trajectories requires the respect for the following five stages:

Stage 1: The regression of the random r_(t) of the band on the sectorial indications. For example, in the case of three bands and two sectorial indications.

$$r_{1,t} = \alpha_1 + \alpha_{1,X} I_{X,t} + \alpha_{1,Y} I_{Y,t} + v_{1,t}$$

$$r_{2,t} = \alpha_2 + \alpha_{2,X} I_{X,t} + \alpha_{2,Y} I_{Y,t} + v_{2,t}$$

$$r_{3,t} = \alpha_3 + \alpha_{3,X} I_{Xt} + \alpha_{3,Y} I_{Y,t} + v_{3,t}$$

To pass in the second stage it is necessary to estimate the various parameters of three models.

Stage 2: The calculation of the variances and the covariance's banding 2 bands i and j:

$$cov(r_i, r_j) = \hat{\alpha}_{i,X}\hat{\alpha}_{j,X} V(I_X) + \hat{\alpha}_{i,Y}\hat{\alpha}_{j,Y} V(I_Y) + (\hat{\alpha}_{i,X}\hat{\alpha}_{j,Y} + \hat{\alpha}_{i,Y}\hat{\alpha}_{j,X})\, cov(I_X, I_Y)$$

And

$$V(r_i) = \hat{\alpha}^2_{i,X} V(I_X) + \hat{\alpha}^2_{i,Y} V(I_Y) + V(v_i^2) 2(\hat{\alpha}_{i,X}\hat{\alpha}_{i,Y})\, cov(I_X, I_Y)$$

By using these two formulae, we can obtain the matrix of the variances-covariance's $\sum$.

Stage 3 : The decomposition of *Cholesky* of the matrix of the variances of the variances-covariance's $\sum$ in the following way (*Hamisultane, 2008):*

$$\sum = AA^T$$

With A represent the lower triangular matrix and AT transposed by the matrix A.

Stage 4: The simulation of variables v $Z_{i,t}$ ~> $N(0,1)$. In fact, the existence of the bond to be feigned allows the existence of f $Z_{i,t}$.

Stage 5: The simulation of the values of the correlated variables by basing itself on a process of geometrical distribution:

$$\frac{dV}{V} = \mu\, dt + A\sqrt{dt}\; Z$$

Thus:

$$\frac{dV}{V} = \begin{pmatrix} dV_t^1/V_t^1 \\ dV_t^2/V_t^2 \\ \vdots \\ dV_t^i/V_t^i \\ \vdots \\ dV_t^n/V_t^n \end{pmatrix} \approx \begin{pmatrix} lnV_t^1 - lnV_{t-1}^1 \\ lnV_t^2 - lnV_{t-1}^2 \\ \vdots \\ lnV_t^i - lnV_{t-1}^i \\ \vdots \\ lnV_t^n - lnV_{t-1}^n \end{pmatrix}$$

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$$\mu = \begin{pmatrix} \mu_1 \\ \mu_2 \\ \vdots \\ \mu_i \\ \vdots \\ \mu_n \end{pmatrix}$$

$$dt = \Delta t$$

$$A = \begin{pmatrix} \beta_{11} & 0 & \cdots & & 0 \\ \beta_{21} & \ddots & & & 0 \\ \vdots & & \ddots & 0 & \vdots \\ \beta_{i1} & & \beta & \ddots & \vdots \\ \vdots & & & \beta \quad \ddots & 0 \\ \beta_{n1} & \beta_{n2} & \cdots & & \beta_{nn} \end{pmatrix}$$

$$\sqrt{dt}\, Z \approx \sqrt{\Delta t} \begin{pmatrix} Z_{1,t} \\ Z_{2,t} \\ \vdots \\ Z_{i,t} \\ \vdots \\ Z_{n,t} \end{pmatrix}$$

According to Crouhy et al. (2000), Nickell et al. (2000) and Bangia et al. (2002), the forces and the weaknesses of this model are presented in the following table:

Table 11 : The forces and the weaknesses relative to the CreditMetrics model

The forces	The weaknesses
▪ In the model CreditMetrics, both aspects of the credit risk are taken into account.	▪ The rating according to companies must be correct. ▪ The interest rates are supposed constant. ▪ The existence of a relation between the economic situation and the probability of defect. In that case, every economic cycle has to have matrices of transition appropriate for him. ▪ The variability of the actions of a company can be used to deduct the variability of the price of the assets of the company.

Source: Crouhy and al. (2000), Nickell and al. (2000) and Bangia and al. (2002)

V. Conclusion

In this paper we developed a comparative theoretical approach's concerning the model of management of credit portfolio. Then, we studied the four mains models of credit portfolio management. In the financial literature those models are grouped by three types of credit portfolio models (Crouhy et al., 2000). The structural models: there are two models of management of credit portfolio who are supplied in the literature: Moody's KMV model (Portfolio Model) and CreditMetrics model by JPMorgan.

The KMV model and Credit Portfolio View base their approach on the same empirical observation that default and migration probabilities vary over time. The KMV model adopts a microeconomic approach which relates the probability of default of any obligor, to the market value of its assets. The Credit Portfolio View model proposes a methodology which links macroeconomics factors to default and migration probabilities. The calibration of this model necessitates reliable default data for each country, and possibly for each industry sector within each country.

Structural models are based on option theory and capital structure the company. On econometric models, they link the probability fault of the company to the state of the economy. The probability of failure depends in these models of macroeconomic factors such as unemployment, the rate of increase GDP, the interest rate long-term. Moreover, in the CreditRisk+ models, the probability of default varies over time.

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Money, Income, and Prices in Saudi Arabia

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Abstract - The paper examines the relationship between the three macroeconomic variables money, income, and prices in the Saudi Arabian economy. The methodology used is cointegration, bivariate and trivariate Vector Autoregressive (VAR) models, and Granger Causality/Block Exogeneity tests. We further supplement our results with impulse response and variance decomposition. The results for Saudi Arabia for the period 1968-2011 indicate two-way causation between income and money supply. The results also show that income Granger causes prices, and money Granger causes money prices.

Keywords : income, money supply, prices, granger causality, vector autoregressive, impulse response, variance decomposition, saudi arabia.

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MONEY, INCOME, AND PRICES IN SAUDI ARABIA

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I. Introduction

The relationship between income, money and prices has been a subject of controversy between economists for a long time. Specifically, the role of money in determining income and prices has been debated extensively. The Monetarists claim that money plays an active role in determining income and prices. In terms of causality, this indicates that both income and prices are mainly caused by changes in the stock of money supply. In other words, there is a unidirectional relationship running from money supply to income and a unidirectional relationship running from money supply to prices.

Keynesians, on the other hand, held the view that money does not play an active role in determining income and prices. According to them changes in the stock of money supply affects the interest rate and hence investment and consumption. That is to say, changes in the stock of money supply, affects income only indirectly. On the other hand, contrary to the Monetarists' view, changes in income cause changes in the stock of money supply through changes in the demand for money, given sticky interest rates. This indicates a unidirectional relationship running from income to money supply. Similarly, according to the Keynesians, prices are determined by the demand and supply forces.

Despite this clear disagreement, it is very critical to understand the relationship between income, money and prices in an economy. Understanding this relationship is important, especially to the public policymakers, in conducting effective stabilization policies. Due to this, a large body of literature in economics deals with income, money, and prices. In particular, the causal relationships between money and income and between money and prices have been an active area of research in economics particularly after the influential paper by Sims (1972). Based on Granger causality, Sims develops a test of causality and applies it to data from the United States to examine the causal relationship between money and income. He finds evidence of unidirectional causality from money to income supporting the Monetarists' claim.

While there is a large amount of empirical literature on the long run relationships between income, money, and prices; there is moderate done work in the context of developing economies. Among the studies pertaining to developing countries are the works of Ahmed and Suliman (1999), Abbas (1991), Khan and Siddiqui (1990), and Joshi and Joshi (1985). Ahmed and Suliman using time series data from Sudan find unidirectional causations running from income to prices and from money to prices. Their study does not find any causal relationship between income and money supply. Abbas (1991) using causality test between money and income for Asian countries finds bidirectional causality in Pakistan, Malaysia and Thailand. Khan and Siddiqui (1990) find unidirectional causality from income to money and bidirectional between money and prices in Pakistan. In terms of Saudi Arabia, not much work has been done to establish the long-run relationship between the three macroeconomic variables income, money, and prices. Among the few works that have been done in the context of Saudi Arabia are the works by Al-Bazai (1999) and Al-Jarrah (1996). Al-Bazai (1999) using interpolated quarterly data for the period 1971.1 to 1995.4 examines the relationship between income (log of non-oil GDP), money (log of M1), and prices (log of CPI). The monthly data in this paper is interpolated from annual data. He finds bidirectional relationship between income and money. He also finds a unidirectional causation running from money to prices and a unidirectional causation running from income to prices. He research uses the vector autoregressive (VAR) model. Al-Jarrah (1996) uses annual time series data to study the relationship between income (Real GDP), and prices. He finds unidirectional causations running from income to money, from money to prices, and from income to prices. He employs the methodology of cointegration and causality.

The present work deviates from both Al-Bazai (1999) and Al-Jarrah (1996) in three different ways. First, we conduct the unit root test with structural breaks.

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Indeed, this is primary reason that motivated me to work on this paper. Second, we use a broader definition of money supply (M3). Third, we conduct both bivariate and trivariate VAR models to reach a definite answer on the question of the relationship between the three variables.

There are two policy tools available to macroeconomic policy makers, namely fiscal policy and monetary policy. Understanding the effect of changes in money supply on income and prices is of critical importance as to which tool is appropriate. In particular, if changes in money supply cause changes in prices, then monetary policy can be used as a policy tool to stabilize the general price movements. The Saudi Arabian Monetary Agency (SAMA) plays an important role in the Saudi Arabia economy. As such, understanding the relationship between money supply and prices and as well money supply and income is of critical importance to SAMA as well as the fiscal policy authorities in the country.

The primary objective of this paper is to study the relationships between income, money, and prices in the context of Saudi Arabia for the period 1968-2011. In particular, the causal relationship between money and income and between money and prices is investigated. The remainder of the paper is organized as follows. Section 2 describes the methodology employed. Section 3 presents the data used, the results obtained, and the discussion of the findings. Section 4 wraps the paper up with summary and conclusion.

II. Methodology

In time series analysis, the properties of standard estimation and testing techniques depend crucially on the assumption that the variables under consideration are stationary. Regression analysis conducted on non-stationary series can produce misleading results. This is referred to as "spurious regression" by Granger and Newbold (1974). Indeed, they maintain that spurious regression "produces statistically significant results between series that contain a trend and otherwise random". Phillips (1986) shows that when the series are not stationary, the ordinary least squares (OLS) estimator is not consistent and the t and F statistics do not follow the known standard distributions. Given the mean and variance of a series are constant over time, then the series is said to be stationary i.e. no unit root. If the series is non-stationary, differencing techniques are normally used to transform a series from non-stationary to stationary. In most cases, the first difference of the series will be stationary. A series could be stationary could be stationary in levels, with or without intercept and/or trend If a series is stationary without the process of differencing, it is denoted by I(0), or integrated of order 0. On the other hand, if a series is stationary after the first difference, it is denoted by I(1), or integrated of order 1. In general, if a series is stationary after thep^{th} differencing, then it is denoted by I(p), or integrated of order . In what follows, we briefly discuss the unit root tests that will be used in this paper. Obviously, the results of these tests will dictate whether a cointegration test is needed or not. If all the series are stationary in levels, then there is no need to proceed with the cointegration test. Furthermore, if the series are not cointegrated, then it is appropriate to use the vector autoregressive (VAR) model as opposed to the error correction model (ECM). The ECM requires the series to be of the same order of integration and requires cointegrating relationship(s) to exist.

a) *Unit Root Tests*

Several methods are proposed in the literature to test for unit roots. These include, but not limited to, Dickey-Fuller (DF) test, Augmented Dickey-Fuller (ADF) test, and Phillips-Perron (PP) test. These are standard tests that do not allow for the presence of structural breaks in the data.

i. *The ADF Test*

The ADF and PP test sare used to test the stationarity of a series. In equations (1) and (2) below the series of interest is y. The symbol Δ indicates the first difference of the series y, and t in equation (2) is a time trend.

$$\Delta y_t = \alpha + \gamma y_{t-1} + \sum_{i=1}^{k} c_{1i}\, \Delta y_{t-i} + e_t \tag{1}$$

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \sum_{i=1}^{k} c_{1i}\, \Delta x_{t-i} + e_t \tag{2}$$

For the ADF test, the null hypothesis is $\gamma = 0$ and the alternative hypothesis $\gamma < 0$. Rejection of the null hypothesis is an indication that the series y is stationary. In equation (1) the alternative hypothesis indicates the series is a mean-stationary and in equation (2) it indicates the series is a trend-stationary. The lagged dependent variables are included in the original DF test to make sure e_t is white noise.

ii. *The PP Test*

The PP unit root test is an extension of the DF test. This test corrects for any serial correlation and heteroskedasticity in the error term of the DF test. The PP test estimates the following equations. Equation 3 includes a constant and equation 4 includes a constant and a trend.

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$$y_t = \alpha + \gamma y_{t-1} + u_t \quad (3)$$

$$y_t = \alpha + \beta t + \gamma y_{t-1} + u_t \quad (4)$$

Apart from correcting any serial correlation or heteroskedasticity that might be present in the error term of the DF test; the PP test has another advantage. That is, we do not need to specify the length of the lag in the PP test.

iii. *Unit Root Tests with Structural Breaks*

The DF, ADF, and PPtests have been criticized due to the fact thatthey do not allow for the presence of structural breaks. It is possible for these tests to reject the unit root hypothesis if the series have structural breaks. Perron (1989) shows that failing to allow for an existing break, leads to a bias that reduces the ability to reject the unit root hypothesis, which is otherwise false. In other words, there is a possibility to commit Type II error. Several authors have proposed to overcome this problem by endogenously determining the breaks. See e.g. Zivot and Andrews (1992), Perron and Vogelsang (1992), Perron (1997), Lumsdaine and Papell (1997), Clements et al (1998), and Lee and Strazicich (2003).

In this paper we pursue the Perron's test since this test is readily available in statistical packages such as Eviews.The Perron's unit root test includes both the time trend (t) and the time at which structural change occurs (DT^b). He specifies what he refers to as the "Innovational Outlier" 1 and 2 and "Additive Outlier" Models. These models are shown, respectively, in equations (5) - (7) below.

$$y_t = \mu + \gamma y_{t-1} + \beta t + \delta DU_t + \alpha DT_t^b + \sum_{i=1}^{k} c_i \Delta y_{t-i} + e_{1t} \quad (5)$$

$$y_t = \mu + \gamma y_{t-1} + \beta t + \delta DU_t + \Theta DT_t + \alpha DT_t^b + \sum_{i=1}^{k} c_i \Delta y_{t-i} + e_{2t} \quad (6)$$

$$y_t = \mu + \beta t + \Theta DT_t + \breve{y}_t + e_{3t} \quad (7)$$

Where $\breve{y}_t = \gamma \breve{y}_{t-1} + \sum_{i=1}^{k} c_i \Delta \breve{y}_{t-i}$.

Again, as is the case with the ADF test, the null hypothesis in the above three models (5)-(7) is $\gamma = 0$ and the alternative hypothesis $\gamma < 0$. Rejection of the null hypothesis indicates the series is stationary with one structural break present in the data. The break date is endogenously determined.

Recently, alternative test methods have been proposed for unit root test allowing for multiple structural breaks in the data series, see e.g. Lumsdaine and Papell (1997) and Bai and Perron (2003). In order to substantiate the results of Perron's unit root test of one structural break point, we also supplement the results with the Bai and Perron test and identify the number of break points in the data.

As will see later in this paper, the three series are drift and/or trend stationary at their levels. As a result of this, we proceed with the VAR model that is briefly described in the next section.

b) The VAR Models

Once we have verified that the series are not cointegrated and have the same order of integration, we can proceed with the VAR model. Let the three series under consideration be denoted by y_t, m_t and p_t then the trivariate VAR models of the following form can be specified:

$$z_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{k} \beta_i z_{t-i} + e_t \quad (8)$$

Where $z_t = (y_t, m_t, p_t)'$ is a vector of the three endogenous variables income, money, and prices, respectively. Needless to mention that the specifications of the bivariate VAR models are similar to the trivariate models except that we have two variables instead. The length of lags k should be appropriately chosen by one of the known criteria of selecting the number of lags. The VAR models can be viewed as reduced form equations in which each endogenous variable is a function of its own past values and the past values of the other endogenous variables in the system. It is worth mentioning here that these models do not allow one to make statements about the causal relationships between the endogenous variables. Even though, after estimation of the models, one can see which coefficients are significant and which ones are statistically insignificant. Therefore, it is essential to conduct causality tests separately. This is the topic of the next section.

c) Granger Causality and Block Exogeneity test

Granger Causality test is a test of whether one time series contributes to the prediction of another time series. The test is based on comparing the mean squared error of the model with and without the variable on the right hand side.

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The block exogeneity test is based on the significance of the estimated coefficients. For instance, Y is block exogenous to X and Z if the estimated coefficients associated with Y are significant in X and Z equations. On the other hand, the set of the series Y and X is block exogenous to Z if the estimated coefficients associated with Y and X are significant in the Z equation.

d) Impulse Response and Variance Decomposition

The impulse response functions show the effects,over time,of an exogenous shock to the endogenous variables in the VAR model. In fact, these impulse response functions provide a means to analyze the dynamic behavior of the target variable due to an exogenous shock in the policy variable(s). In other words, the impulse response functions trace the reaction of all the variables in the VAR system to shocks in one of the variables. Following Koop, et al (1996) and Pesaran and Shin (1998), we denote the known history of the economy up to time t-1 by the non-decreasing information set I_{t-1}. Then the generalized impulse response function of z_t at horizon h is defined as follows:

$$\mathrm{GI}(h, \delta, I_{t-1}) = \mathrm{E}[z_{t+h}|e_t=\delta, I_{t-1}] - \mathrm{E}[z_{t+h}|I_{t-1}] \tag{9}$$

Where δ is the one time exogenous shock. Equation (9) says that the impulse response function equals the expected value of current and future values of an endogenous variable given the shock and past information minus the expected value of the endogenous variable given past information. In essence, it is the effect of the shock on the current and future values of the endogenous variable.

An alternative approach to the impulse response is the variance decomposition, which shows the dynamic structure of the VAR model. The variance decomposition can be viewed as showing the portion of variance in the prediction of each endogenous variable in the system that is due to its own innovations and to shocks to the rest of the endogenous variables in the system.Unlike the impulse response, the variance decomposition seeks to achieve information about the forecasting ability of the VAR model.

III. Data, Results, and Discussion

In this section the data used is described and the results obtained are presented. We also provide a brief discussion of the findings obtained in the results section. The results obtained are generated using the Eviews software.

a) Data

Data on the money supply (M3), the non-oil gross domestic product (GDP) and the consumer price index (CPI) are obtained from the 48th annual report of SAMA. The money supply and the non-oil GDPare measured in millions of Saudi Arabian riyals.The base year for CPI is 1999. We take the natural logarithm of all three variables i.e. non-oil GDP, M3 and CPI and use them in the analysis. We take this step to minimize any serial correlation that might present in the error terms. In the subsequent sections, we denote these three variables by Y, M, and P, respectively.

b) Results

In this section we display the results of the various tests conducted. Whenever possible, each test uses at least two different methods in order to reach a definite conclusion.

i. *Unit Root Tests*

The results of the three unit root tests considered in the methodology section are shown below. Table 1 displays the results of the ADF and PP tests. Both tests consistently indicate that the three series are second difference stationary. That is to say, they are integrated of order 2. The results also suggest that income and money are drift and trend stationary in their levels per the AFD test. However, this is not the case with the PP test. As we have indicated above, these standard tests may produce misleading results when there are structural breaks in the data. As a result, we will delay making a conclusion on stationarity until the tests of unit roots with structural breaks are presented.

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Table 1 : The ADF and PP Tests

		ADF		PP
Variable	Intercept	Intercept & Trend	Intercept	Intercept & Trend
Y-Level	-2.6305	-3.7227*	-2.6708	-1.8855
Y-1St Difference	-1.6661	-1.8465	-1.6661	-1.8465
Y-2nd Difference	-4.3493**	-4.2920**	-4.2137**	-4.1501*
M-Level	-3.0119*	-6.2997**	-2.7306	-1.9992
M-1st Difference	-2.1338	-2.2357	-2.3149	-2.4269
M-2nd Difference	-6.6522**	-6.5600**	-6.6541**	-6.5607**
P-Level	-2.8275	-3.4331	-2.4375	-2.0277
P-1st Difference	-2.1338	-2.2357	-2.3149	-2.4269
P-2nd Difference	-4.8410**	-4.7778**	-4.7513**	-4.6302**

(**) and (*) indicate significant at the level of significance 1% or lower and 5% or lower.

To have an idea how the trends of the three variables look like graphically, we display Chart 0 for this purpose. It can be clearly seen from the Chart that the second difference appears to be stationary for all three variables. It is also interesting to note that the three variables move together over time. The level and first difference of the three variables indicate spikes around 1975. This appears to be the effect of the oil prices shock of 1973.

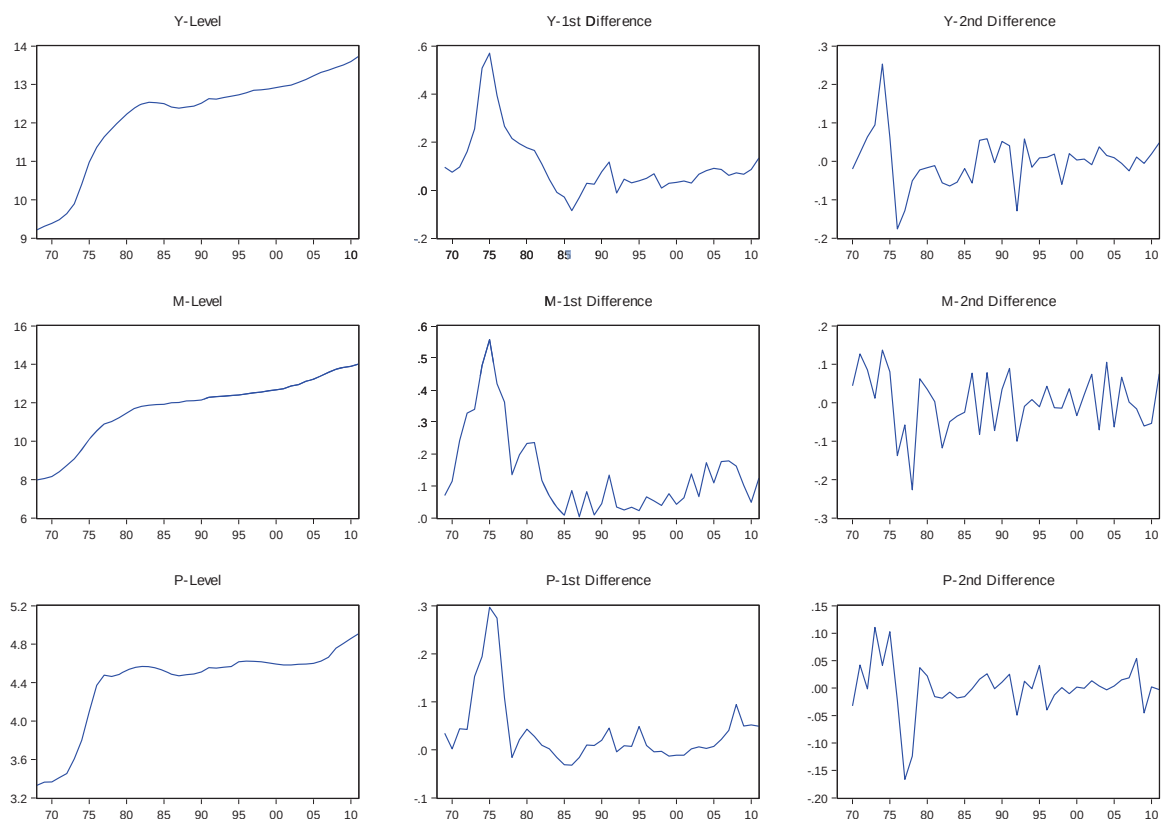

Chart 0 : Y, M, and P in levels, 1st differences, and 2nd differences

Table 2 shows the results of the Perron's unit root test with one endogenous structural break. We note that when a drift, a trend, or both are included, all the three variables are stationary in their levels. Notice that both Y and M are drift or drift and trend stationary with the presence of a structural break. However, P is only drift and trend stationary with the presence of a structural break. The results also suggest that the three

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series are stationary in second difference. However, we disregard the second difference stationarity result as being over-differencing. There is a consensus among econometricians that with the situation of over-differencing, the autoregressive representation does not exist and hence a VAR would be misspecified. Therefore, it is essential to make sure the stationarity of the series is looked at very carefully.

Table 2 : Perron's Unit Root Test with One Endogenous Structural Break

		Intercept		Trend		Both
Variable	TB	t-Statistic	TB	t-Statistic	TB	t-Statistic
Y-Level	1991	-6.2925**	2005	-3.831	1994	-6.0677*
Y-1st Difference	1992	-4.6590	1981	-3.1495	1983	-4.5349
Y-2nd Difference	1974	-7.0573**	1978	-5.2523	1974	-7.0655*
M-Level	2003	-7.6784**	2004	-4.1667	2003	-7.7101**
M-1st Difference	1977	-4.3633	1989	-3.8843	1977	-4.2757
M-2nd Difference	1975	-9.0500**	1978	-8.6465**	1978	-9.7744**
P-Level	1979	-4.9176	1980	-4.7317	1979	-6.3941**
P-1st Difference	1976	-3.8251	1986	-2.8899	1976	-8.0472*
P-2nd Difference	1977	-6.9456**	1978	-5.5719**	1977	-6.2918**

(**) and (*) indicate significant at the level of significance 1% or lower and 5% or lower.

We have also conducted the Bai-Perron unit root test with multiple structural breaks. When using levels, the test suggests that there are four break points in Y, four break points in M, and three break points in P.

ii. *VAR models and Granger Causality and Block Exogeneity Tests*

In order to make sure the conclusions reached at are consistent and definite, we estimate both bivariate and trivariate VAR models. We also report the Granger Causality and Block Exogeneity tests based on these models. Table 3 below shows the results of the bivariate VAR models.The length of lags was determined on the Schwarz Information criterion. In the first set of equations Y and M, we observe that the estimated coefficients associated with the lagged values of Y in both equations are significant. The coefficients of the lagged values of M are significant in M equation. In the second set of equations Y and P, again the estimated coefficients associated with lagged values of Y are significant in both equations. While the estimated coefficients associated with lagged values of P are significant in P equation, they fail to be significant in the Y equation. In the last set of equations M and P, the lagged values of M affects both M and P. However, the estimated coefficients of the lagged values of P fail to be significant in the M equation.

Table 3 : Bivariate VAR Models

		Intercept		Trend		Both
Variable	TB	t-Statistic	TB	t-Statistic	TB	t-Statistic
Y-Level	1991	-6.2925**	2005	-3.831	1994	-6.0677*
Y-1st Difference	1992	-4.6590	1981	-3.1495	1983	-4.5349
Y-2nd Difference	1974	-7.0573**	1978	-5.2523	1974	-7.0655*
M-Level	2003	-7.6784**	2004	-4.1667	2003	-7.7101**
M-1st Difference	1977	-4.3633	1989	-3.8843	1977	-4.2757
M-2nd Difference	1975	-9.0500**	1978	-8.6465**	1978	-9.7744**
P-Level	1979	-4.9176	1980	-4.7317	1979	-6.3941**
P-1st Difference	1976	-3.8251	1986	-2.8899	1976	-8.0472*
P-2nd Difference	1977	-6.9456**	1978	-5.5719**	1977	-6.2918**

(**) and (*) indicate significant at the level of significance 1% or lower and 5% or lower.

While it is possible to detect of the relationships between the three variables from the results of the above Table, it is essential to conduct the Granger causality and Block Exogeneity test. Table 7 reports the results of this test. It is seen from the results of the test that M Granger causes Y, Y Granger causes M, Y Granger causes P, and M Granger causes P. The p-values those are greater than are 0.05 are considered insignificant in this paper.

Table 4 : Bivariate VAR: Granger Causality/Block Exogeneity Test

Null Hypothesis	df	Chi-Square Statistic	P-value
Y does not Granger cause M	2	06.8740	0.0322
M does not Granger cause Y	2	09.6510	0.0080
Y does not Granger cause P	2	22.1906	0.0000

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P does not Granger Cause Y	2	00.0647	0.9668
M does not Granger Cause p	2	14.9069	0.0006
P does not Granger Cause M	2	01.5044	0.4713

We next turn to the trivariate VAR models, Granger causality, and Block Exogeneity test. Table 8 reports the results of the trivariate VAR models. The lagged values of Y are significant in all three equations. In the income equation, the money lagged one period is significant. In the money equation, money lagged one period is significant and price lagged one period is just significant at the 10% level. In the price equation, price lagged one period is quite significant.

Table 5 : Trivariate VAR Models

	Y_t	M_t	P_t
Y_{t-1}	1.5400 (7.35)	0.6721 (2.91)	0.4196 (3.85)
Y_{t-1}	-1.0262 (-5.14)	-0.6666 (-3.02)	-0.5123 (-4.93)
M_{t-1}	0.3431 (2.02)	1.2910 (6.90)	0.0914 (1.04)
M_{t-2}	0.0153 (0.09)	-0.2204 (-1.17)	0.1257 (1.42)
P_{t-1}	-0.4500 (-1.57)	-0.5103 (-1.61)	0.8187 (5.48)
P_{t-1}	0.5642 (1.90)	0.1587 (0.48)	-0.2015 (-1.30)
C	1.3365 (4.66)	0.7301 (2.30)	0.4325 (2.90)
T	-0.0044 (-1.20)	-0.0013 (-0.31)	-0.0075 (-3.95)
Adjusted R^2	0.998	0.998	0.995

Figures in parentheses are the t-statistics values.

Table 6 shows the results of Granger causality and Block Exogeneity test. Looking at the p-values, it is clear that P does not Granger cause Y and P does not Granger cause M. In the rest of the results, the null hypothesis is rejected at 1% level of significance or lower. That is to say, Y Granger causes M, M Granger causes Y, Y Granger causes P, and M Granger causes P. These findings coincide with the results obtained from the bivariate VAR models.

Table 6 : Trivariate VAR: Granger Causality/Block Exogeneity Test

Null Hypothesis	df	Chi-square Statistic	P-value
M does not Granger cause Y	2	13.6034	0.0011
P does not Granger cause Y	2	03.6100	0.1645
Y does not Granger cause M	2	10.0104	0.0067
P does not Granger Cause M	2	04.4985	0.1055
Y does not Granger Cause P	2	24.3050	0.0000
M does not Granger Cause P	2	17.006	0.0002

iii. *Impulse Response*

Before we proceed presenting the results of the impulse response functions, it is essential to make sure the VAR models are stable. The chart below shows the Inverse Roots of AR Characteristics Polynomial. As can be seen from the chart all the roots lie inside the unit circle confirming the stability condition of the trivariate VAR models.

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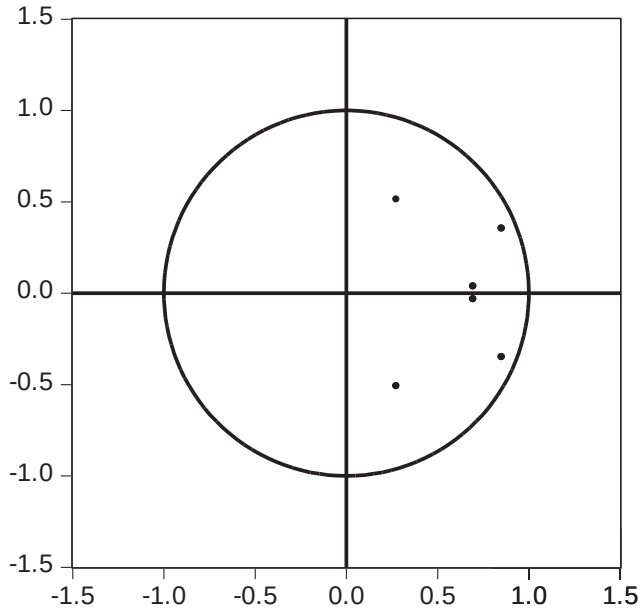
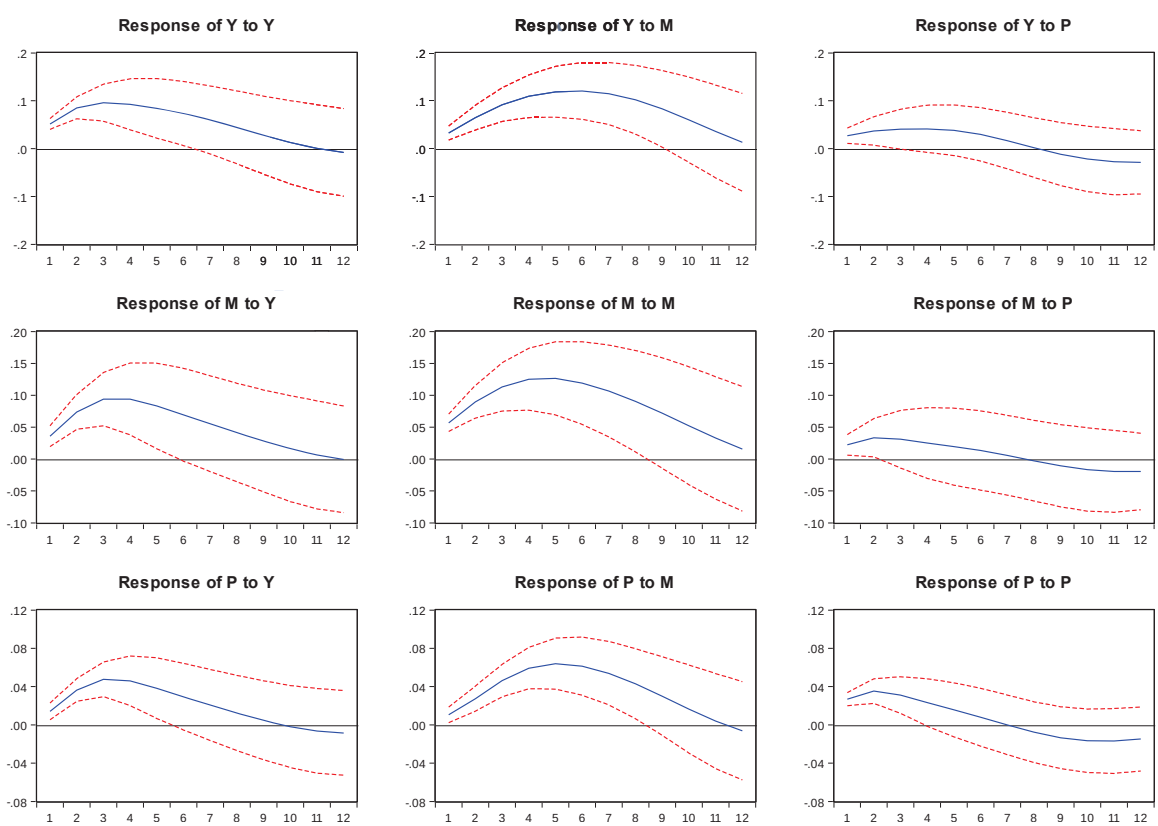
Chart 1 : Inverse root of AR Characteristics Polynomial



Turing to impulse responses, the impacts of one standard deviation shock of each one of the endogenous variables Y, M, and P are shown in Figure 2 below. It is clear from the Chart below that a 1 SD innovation of Y has an impact on Y, M, and P. Similarly, a 1 SD innovation of M has an impact on M,Y and P. Furthermore, a 1 SD innovation of P has little impact on Y and M. These results also confirm the Granger causality results.

Chart 2 : Response to generalized one S.D Innovations S.E.



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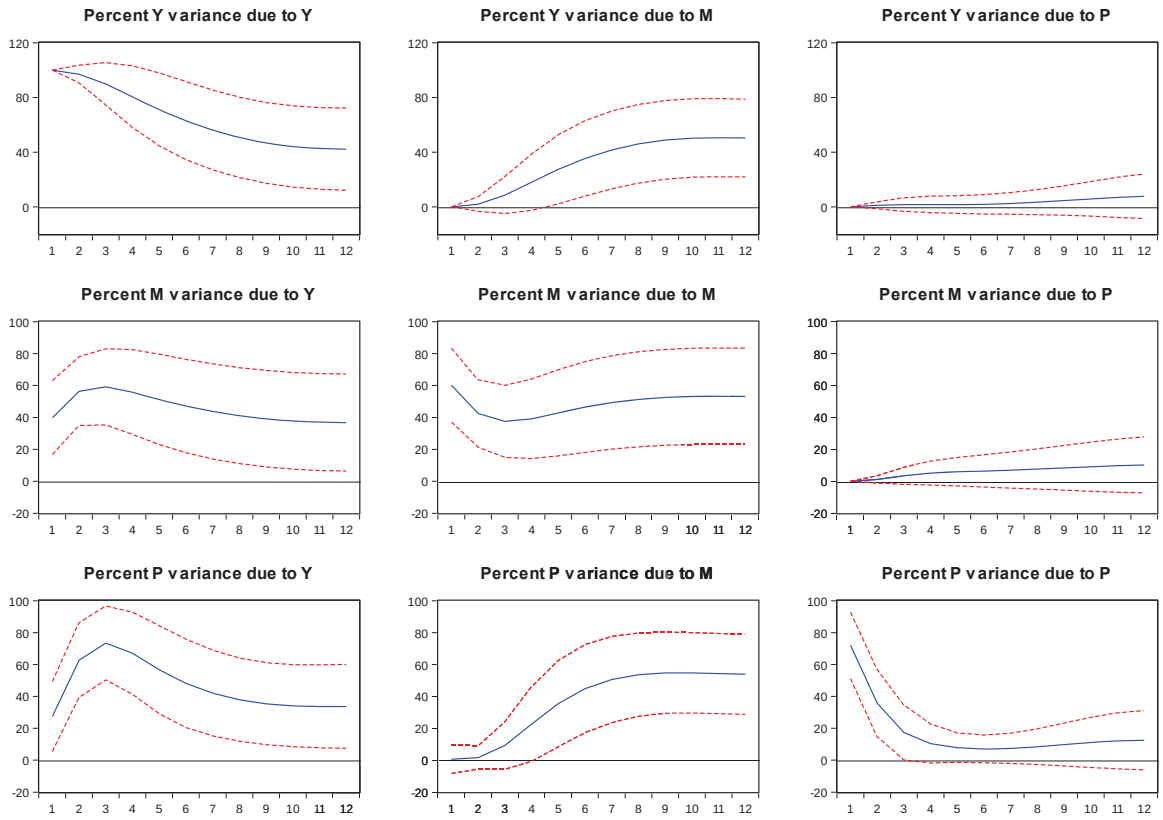
iv. *Variance Decomposition*

In the chart below, Chart 3, we display the variance of each one of the endogenous variables due to each one of the endogenous variables separately. The chart further supports the causality results. In particular, notice that the variances of Y and M due to P are minimal indicating that P does not granger cause Y and M. The dashed lines are the 95% confidence intervals.

Chart 3 : Variance Decomposition ± 2 S.E



c) *Discussion*

The results of the tests clearly indicate there are causal relationships between income, money, and prices. We find bidirectional relationship between money and income, a unidirectional causations running from income to prices and from money to prices. The results do seem to support the Monetarist claim that money plays an important role in determining income and prices. Money affects both income and prices as suggested by the monetarists. Changes in income appear to affect money supply through the effect of income on the money demand as hypothesized by the Keynesians. The causation running from money to income can also be explained in terms of the Keynesians economics. Changes in the money supply cause changes in nominal interest rates causing both consumption and investment to change. Changes in consumption and investment cause changes in aggregate demand and hence income. However, this effect depends on the sensitivity of investment and consumption to changes in the nominal interest rate. Specifically, if investment function is inelastic, this effect will be minimal. The causation running from money to prices also supports the Keynesians view. As prices change so does the demand for money and hence the supply of money provided that interest rates are rigid. The causation running from income to prices can also be explained by the Keynesian economics. Changes in income shifts the aggregate demand curve and hence affecting prices.

The impulse response functions and the variance decomposition support the causality results. What are the policy implications of these findings? SAMA should probably pursue monetary policy to stimulate the economy. Perhaps a policy mix should be more appropriate to control prices (inflation).

IV. Summary and Conclusion

This paper attempts to establish the relationship between income, money, and prices in the context of Saudi Arabian economy. We use data from Saudi Arabian economy for the period 1968-2011. The length of the time frame is dictated by the availability of the data. The income variable is taken as the non-oil gross domestic product. The money supply variable is taken

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as the broad definition M3. The price variable is consumer price index with base year 1999. We use the natural logarithms of these variables in our analysis. The methodology used is the VAR Models and the Granger causality block exogeneity tests. We find bidirectional relationship between income and money, a unidirectional causation running from income to prices and from money to prices. These results do appear to support the monetarists' contention. They also seem to support the Keynesians' view that income affects money supply through the money demand channel, especially if the interest rates are rigid. Also, the results indicate that both money and income pose pressure on prices (inflation). In terms of policy implications, SAMA should pursue monetary policy to stimulate the economy. Perhaps a policy mix would be more appropriate to control prices (inflation).

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Information-Knowledge Space: A Transformation Model for IT and other knowledge Intensive organizations

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Abstract - This paper is a sacred endeavor in a mini form to conglomerate all the different aspects of knowledge management derived from information system applicable to an organization by way of formulization regarding sampling and defect detection thereof through a mathematical based model in a geometrical shape in the business perspective so that it can proliferate optimal and desired return to the organization. Sincere and meticulous attempt has been made to derive and eventually ascribe an idea of Information-Knowledge Space for identification of knowledge management style in order to bridge up knowledge management with organizational performance.

This paper has taken an attempt also to propound a suggestion to the effect that available knowledge recourses of an organization is required to be codified and then this can help bridging suitable relation amongst the different knowledge styles and organizational performances. After thorough studies it has been inferred that if an organization becomes able to manage its knowledge after appropriately blending the management of human as well as technological knowledge, the organization can improve its performance to a great extent. This paper has also been able to give much food for reflection to the future researchers in the matter of conceptualization of knowledge creation processes in an organization and as such this paper carries equal value to the back and front grounds of academicians and to the business organizations to reach their goal.

Keywords : knowledge management system, knowledge creation, knowledge management officer, tacit and explicit knowledge, knowledge conversion cycle, i-k space, 3d knowledge model, knowledge culture, sampling strategy.

GJMBR-A Classification : JEL Code: 080701

INFORMATION-KNOWLEDGE SPACE A TRANSFORMATION MODEL FOR IT AND OTHER KNOWLEDGE INTENSIVE ORGANIZATIONS

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Information-Knowledge Space: A Transformation Model for IT and other knowledge Intensive organizations

Sheshadri Chatterjee [α] & Ranjan Chaudhuri [σ]

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I. Introduction

At the outset it will be perhaps pertinent to take a sincere trial to clarify and elucidate as to what is usually meant by knowledge and knowledge management. Actually the meanings of knowledge and knowledge management continued to be or are still continuing to be or perhaps will continue to be open to remonstration. However in business perspective, knowledge is meant here as having detail business information about customers, products, processes, competitors and so on which can be locked away in the mind of people and filed on paper or even can be put in electronic form. On the other hand, knowledge management means a systematic and organized attempt for the best use of knowledge in an organization in order to transform the capability to store and to utilize knowledge (Applicability) for improving performances so that the organization can succeed to a great extent.

Here a holistic attempt has been taken to represent knowledge management through some broad operational variables (Processes) presuming as if they are moving in a space with their targeted prank and their simultaneous forces are converged with proper synchronization so that knowledge as if an object in that hypothetical space named as Information Knowledge Space experiencing that joint force is gaining tremendous momentum to change its inertia to follow a concrete and flawless path to attain proper success to the organization as a whole.

It is obvious that the knowledge management strategies are nothing but palatable and resonant assimilation of human strategies as well as technological strategies. But the work of business leaders to make a suitable texture of these two sometimes becomes hard nut and it is experienced that very often the managers become foxed as to how to compromise in between? Besides, lack of empirical studies in knowledge management [Leech and Sutton, 2002] has also made it difficult to make the issue more generalized since it is experienced that so far very little studies have been made taking cases of large number of organizations by way of sampling and suggesting to nullify defect of such sampling. Here an endeavor has been launched to give a theoretical idea through mathematical formulae as to how to generalize the result of study applicable to all the organizations by way of sampling with minimum trace of flaw so far as detection of success to organizations by thorough application of knowledge management is concerned.

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II. Historical Review On Knowledge Management

Previously business leaders of organizations used to have focused attention to just control the source of knowledge in an organization in a most humdrum way but with passage of time that traditional scenario has undergone a drastic reduction. Of late, the attention is more and more focused on how to manage the processes through which the resources can with their highest potentiality apply their personal and technological knowledge and as a culmination of that we are listening very frequently terms like knowledge, knowledge management, knowledge management style, innovation, strategies etc in an organization. Using knowledge based strategies now most of the organizations have become more customer focused and the organizations use knowledge based strategies to reach out their customers as is especially seen in knowledge-intensive industries. The main target of knowledge management is to build an organization that can 'see' the customers properly since it is the customers that drive any business of an organization. Recently, to achieve organizational success, organizations are using Product Development Management (PDM), Supply Chain Management (SCM), and Customer Relationship Management (CRM) etc. which are nothing but off spring of knowledge management.

All these important issues/inputs now-a-days have come into surface though previously the target of the business leaders was only to how to get the job done within stipulated time and within limited budget and resources. Things may be easily visualized if we see that as the days are rolling greater is the dealing with the knowledge management by different organizations, regardless of their dimensions (Fig. 1). The growth is suggested to be, though not linear, but curvilinear. Here in the following figure research done in knowledge management and corresponding years is shown. It is assumed that as the days are rolling on greater is the acceleration of investment by various organizations on knowledge management. As we know that organizations are becoming more knowledge intensive so they are giving tremendous emphasis on their knowledge management aspects. So in the following figure the curve is shown like an exponential curve.

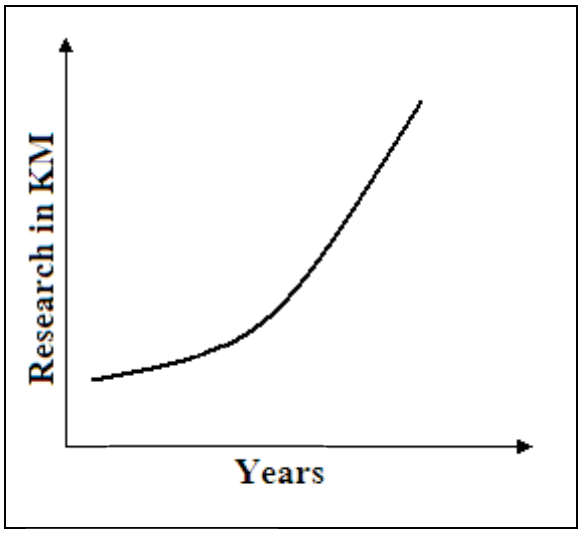

Figure 1 : Growth of Knowledge Management

III. Knowledge Management System

Product Development Management (PDM), Supply Chain Management (SCM), Customer Relationship Management (CRM), Marketing Information System (MIS) etc are the basic tools of knowledge management system and each on its own is scheduled to bring desired outcome if used appropriately. Obviously, the outcomes of these processes are required to be assimilated in an appropriate way to fetch optimal result to the organization. Thus for coordination and integration of these outcomes in a befitting and congenial way a system is required to be used which is nothing but usually termed as knowledge management system.

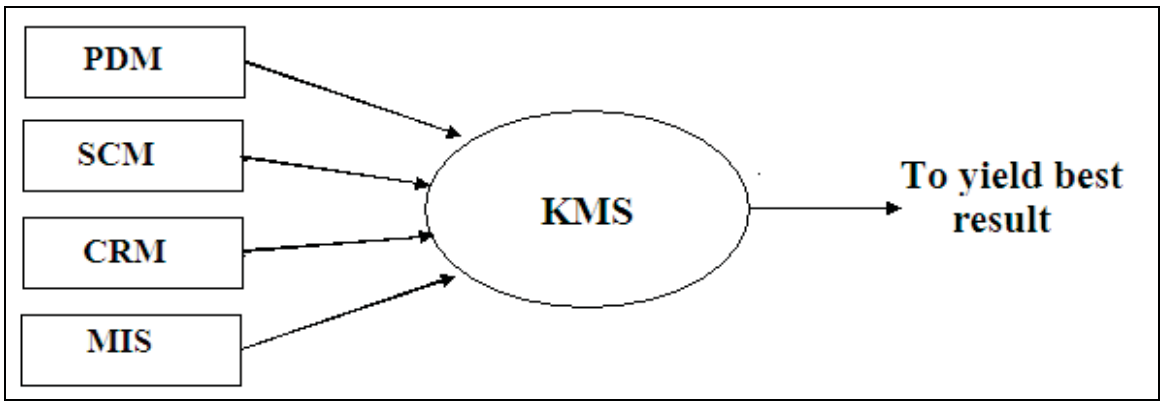

Figure 2 : Conglomerates of KMS

Symbolically speaking,
KMS= Φ (Independent Variables, Dependent Variables)

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$$\text{And } \psi^* \text{ (Independent Variables)} \sim \Sigma\,\Sigma\,\Sigma\,\Sigma \text{ (Promotion, Price, Place, Product/Services)}$$

$$\text{i.e. } \psi^* \text{ (I.V)} = \iiiint \text{(4Ps)}$$

$$\text{Again } \Phi^* \text{ (Dependent Variable)} \sim \Sigma\,\Sigma \text{ [Customer Behavioral Responses (CBR), Performances Measures (PM)]}$$

$$\text{i.e. } \Phi^* \text{ (D.V)} = \iint \text{(CBR, PM)}$$

$$\text{Again, [CBR]}_{\text{Conception}} \equiv \text{[Knowledge of Preference, Knowledge of Awareness, Knowledge of Purchase etc]}$$

$$\text{And, [PM]}_{\text{Conception}} \equiv \text{[Financial Aspects, Non-financial Aspects]}$$

$$\text{Financial Aspects} \sim \begin{bmatrix} \text{Knowledge of costs,} \\ \text{Project,} \\ \text{ROI,} \\ \text{Cash flow,} \\ \text{Brand value,} \\ \text{Sales value,} \\ \vdots \end{bmatrix}$$

And,

$$\text{Non-Financial Aspects} \sim \begin{bmatrix} \text{Knowledge of sales volume,} \\ \text{Sales volume,} \\ \text{Market share,} \\ \text{Customer satisfaction,} \\ \text{Competitive advantage,} \\ \text{Brand image,} \\ \text{New patents,} \\ \vdots \end{bmatrix}$$

Besides these what are envisaged above the independent variables (I.V) also include the knowledge of organization relating to micro and macro environment in which the organization is continuing its business.

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Obviously,

$$\text{Micro Environment} \sim \oint \left(\text{Knowledge of value chain, Knowledge of human intellectual capital, Knowledge of competitors etc}\right)$$

$$\text{And Macro Environment} \sim \theta \left(\text{Knowledge of functions like Social, Legal, Technological, Political, Demographic issues etc}\right)$$

It can be viewed as in the following figure.

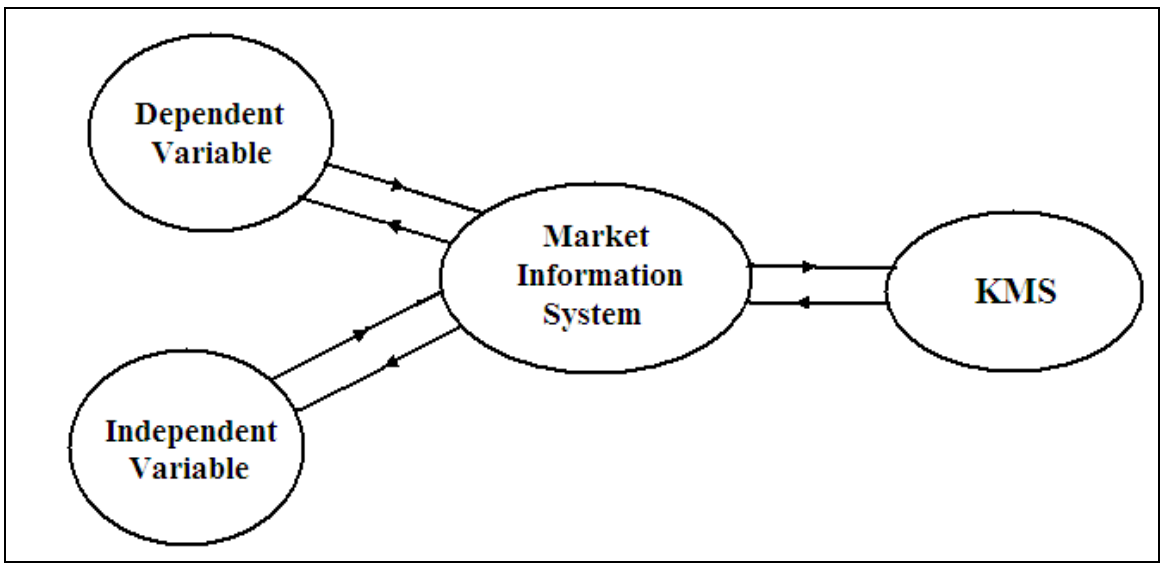

Figure 3 : KMS Overview

IV. Knowledge Creation

If the conceptions of knowledge and knowledge management in an organization are hazarded it transpires that there exists a very close relation in between knowledge management and organizational functions. Again organizational functions include innovation, savings of time i.e. to get the job done within tight schedule and profit to the organization, the profit might be tangible or intangible. Obviously, the very word creativity has a close liaison with innovation process and innovation which may be, broadly speaking, construed as idea 'generation' *[Majaro, 1988*]. Again knowledge creation has been defined as 'beliefs based on information'. *[Dretske, 1981].*

Actually each and every member of an organization engaged in a work is required to contribute his/her knowledge and having value addition this gives rise to team-based knowledge creation and this team-based knowledge creation eventually leads to knowledge creation to the organization as a whole.

The result oriented approach of knowledge creation dawns on the fact that the capability for developing knowledge from processing information is engineered in a mechanical way. This actually ventilates about the organization relating to how the organization is being able to codify knowledge. And it is a fact that when knowledge is ready to be utilized appropriately by any resource or the group of resources in an organization it is obvious to infer that had that knowledge not been available, question of it's utilization would not have cropped up [Lexico Publishing Group, 2002].

Actually organizational knowledge is created by way of profound interaction amongst technologies, techniques and individual knowledge skill i.e. human knowledge. Organizational knowledge is a suitable blending of these three key factors [Bhatt, 2001]. Creation of knowledge is done by way of recombining and reorienting foreground and background knowledge including tacit and explicit knowledge by way of multifarious sets of interactions which come on the way when business leaders and/or resources approach to face and/or to solve a problem which brooks no delay.

$$\text{Knowledge Creation} \simeq \iiint \left[\text{Technologies, Techniques and (Tacit and Explicit) Knowledge}\right]$$

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V. Knowledge Management Officer (KMO) and Transfer of Knowledge

Save as processes and technologies we can hardly set the necessity of human knowledge at naught. These three factors i.e. processes, technologies and human knowledge actually constitute and implement knowledge management. We can't disregard the importance of inputs of human knowledge since minus this all we have is the information in databases. These databases, as they are, can fetch nothing positive to the organizational goal unless and until the information contained within the organization is analyzed, interpreted, codified, filtered correctly by human resource and knowledge so produced is then required to be shared within the organization. It is our common experience that when organization started its foundation of structure, many knowledge creating human resources used to have got good bye taking with them, in a most miserly manner, the important and valuable tacit knowledge which have not been captured and/or stored by the organization. And here lies the importance of engaging Knowledge Management Officer (KMO) or, so to say, 'Knowledge Champion' who would be there to arrest and store the tacit knowledge for its future utilization when situation so demands and also this KMO is required to integrate and coordinate all other knowledge assets within the organization and the KMO is scheduled to ensure that the knowledge is not left unutilized, rather that is required to be shared with the appropriate people of that organization.

It is essential by the KMO to captive knowledge embedded in an organization since it is our common experience that an employee in an organization usually doesn't stay for a long time culminating thereby loss of 'Knowledge Creating Employees' *[Nonaka,I and Takeuchi, H; New York, Oxford University Press, 1995].* And as they leave the organization they take away the tacit knowledge which is nothing but the knowledge inside the head of an individual and actually it is seen that 90% of the knowledge in an organization is tacit knowledge according to the website Libsuite KM *[5].* It is very important to captive this tacit knowledge and arrange to transfer it to 'Explicit Knowledge' which is actually organizational knowledge in systems within the organization that can be, as and when required, communicated to people and processes that are connected to the internet.

a) Tacit to Explicit

For the conversion of tacit knowledge to explicit knowledge the literature of knowledge accusation in expert system provides both guidance and techniques *[16].* Actually, accusation of knowledge is associated with involvement of using various techniques for eliciting information which either may be verbal or even may be quantitative from the knowledge worker who might interpret skillfully this information along with the inner knowledge and with the proper reasoning so that either some model there from may be constructed or a language thereto may be described [11]. The Decision Support System (DSS) can also help for this required conversion from tacit to explicit knowledge with the help of some specification of mathematical model through model building process like Linear Programming Model. In this process, the knowledge, worker would be requested to clarify explicitly the goal or objective of the models, the decision variables, the relative importance of decision variables if goal programming model is adopted, the model constrains with regard to decision variables and the estimation of both the numerical coefficients of the decision variables in each constrain and in the objective function along with the Right Hand side constrain values. The resulting models may be stored in the repository in the form of a set of explicit mathematical inequalities [23] or annotated graphs of arches and nodes in network flow model [14, 22] or a set of descriptions [15] or a condensed canonical model formation associated with links to rational tables for installation [21]. Besides, the KMO may also utilize the techniques for conversion of tacit to explicit knowledge by exploring one or more what-if cases i.e. model instances representing congenial situations that the knowledge worker wants to explore. Another technique that may be used for conversion of tacit to explicit knowledge is brain storming. The ideas, likes and dislikes of the brain storming sessions are required to be stored as text streams for sharing, processing and for usage in future when situation so demands.

b) Explicit to New Knowledge

Thus by any process whatsoever the tacit knowledge is stored in appropriate from as explicit knowledge. Now this can be leveraged by making it available to others as and when they are needed. In furtherance, analyzing explicit knowledge to produce new knowledge can, in addition, leverage it.

There are many techniques available for conversion of explicit knowledge to new knowledge. Firstly, explicit knowledge generated from brainstorming sessions and stored thereafter can be analyzed by text mining software. It is a form of AI-best data mining (for providing key words) related concepts, clusters of similar idea etc. Secondly, explicit knowledge stored in the form of examples of a mathematical model (what-if cases) can easily be leveraged with the help of 'Deductive and/or Model Analysis System (DMAS)'. Thirdly, for conversion of explicit to new knowledge, Inductive Model Analysis Systems (IMAS) is also frequently utilized. This IMAS operate on a set of many related model instances which represent historical situations familiar to knowledge worker and/or several what-if cases. Fourthly, another process of explicit knowledge leveraging is found in Case/Based

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Reasoning (CBR) which is characterized by the knowledge worker making his/her inferences and decisions based directly on previous cases recalled from the memory [17].

c) Explicit to Implicit (Tacit) Knowledge

Different techniques are also used by KMO for necessary conversion of explicit to implicit knowledge. They are argument generation process, change to mental models, insights, ES explanation, Kinematic analysis and simulation.

d) Tacit to Tacit Knowledge Sharing

This can be done with the help of various techniques like film clips, kinematics and virtual.

Thus the conversion cycle as a whole may be shown in a tabular form as follows:

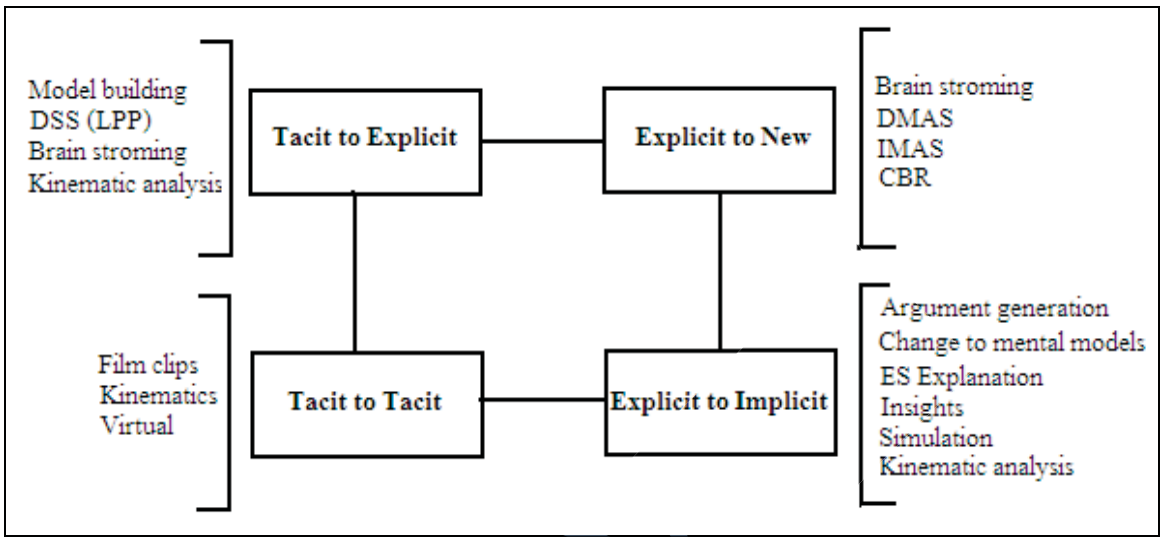

Figure 4 : Knowledge Conversion Cycle

However attempts will be taken much more regarding further fragmentation of tacit knowledge to semi tacit knowledge, explicit knowledge to semi explicit knowledge at the time of discussion of I-K Space model.

From the above discussion it is clear that the role of KMO in an organization for knowledge management purposes is very vital and it is seen now-a-day so many organizations are adhered to much more importance towards this role.

VI. Transformation Information-Knowledge Space (I-K Space)

Information Knowledge space is nothing but a logical extension of Information Space [Boisot, 1998]. The I-K Space is represented through a 3-D figure. Through representation of this figure attempts have been taken to bring together three essential dimensions of knowledge which are derived from available information. They are Codification, Availability and Applicability.

Nonaka has given four techniques for conversion of knowledge processes which are Socialization, Externalization, Combination and Internalization (SECI). They may be represented in four planes of I-K Space *[Nonaka and Takenchi, 1995]*.

Here codification dimension spreads from a point which is difficult to articulate and is denoted by Δc1 to that point which may be easily automated and is denoted as Δc2. Availability dimension covers a wide range of knowledge from that which is available to only one or two agents within a single sector denoted as Δa1 to that which is readily available to all agents wanting to make its use and is denoted by Δa2. In the same way dimension of applicability is denoted from Δap1 to Δap2.

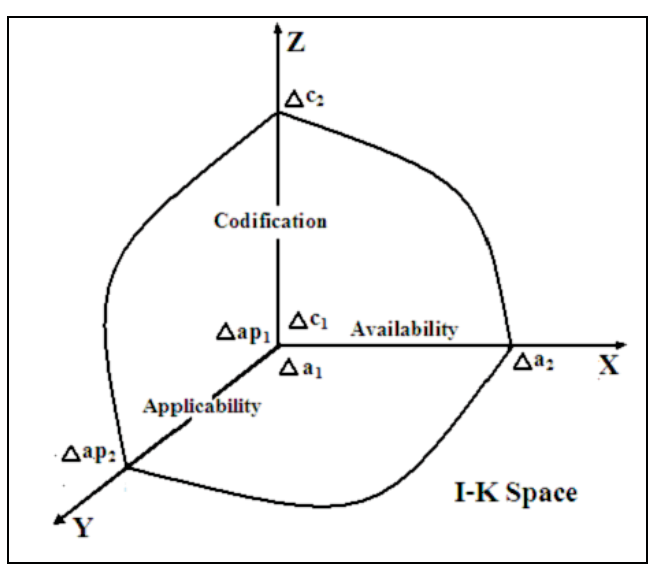

Figure 5 : Information – Knowledge Space (I-K Space)

Slight endeavor will help locating the four models Socialization, Externalization, Combination and

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Internalization (SECI) of Nonaka in this I-K Space. Availability of knowledge is launched definitely through non technical means and socialization obviously affects the availability of knowledge. Again applicability always helps employees of an organization informed regarding the resource applying knowledge. Such being the scenario, the socialization is required to occupy the lower plane containing applicability-availability.

Again, it is clear that externalization is closely associated with codification and also is related with applicability of knowledge and hence externalization should lie on the initial plane containing applicability and codification and with the same logic obviously thus internalization would lie on the upper part of applicability-codification plane.
Thus it is distinct that

$$\text{i.e. Socialization} \sim \Phi\left(\text{Applicability, Availability}\right)_{\Delta ap_1, \Delta a_1}$$

$$\text{Externalization} \sim \psi\left(\text{Applicability, Codification}\right)_{\Delta ap_1, \Delta c_1}$$

$$\text{Whereas,} \quad \text{Internalization} \sim \psi^*\left(\text{Applicability, Codification}\right)_{\Delta ap_2, \Delta c_2}$$

Again availability of knowledge is always influenced by combination process. How knowledge can be available is sought for by any one, he/she is required to take recourse to advanced technology and so knowledge codification here is always high and invariant. With the same logic it is inferred that applicability always keeps employees aware as to who is going to apply knowledge and judged from this argument the combination process is very likely to capture the upper side of availability-applicability plane.

$$\text{Combination} \sim \theta\left(\text{Availability, Applicability}\right)_{\Delta a_2, \Delta ap_2}$$

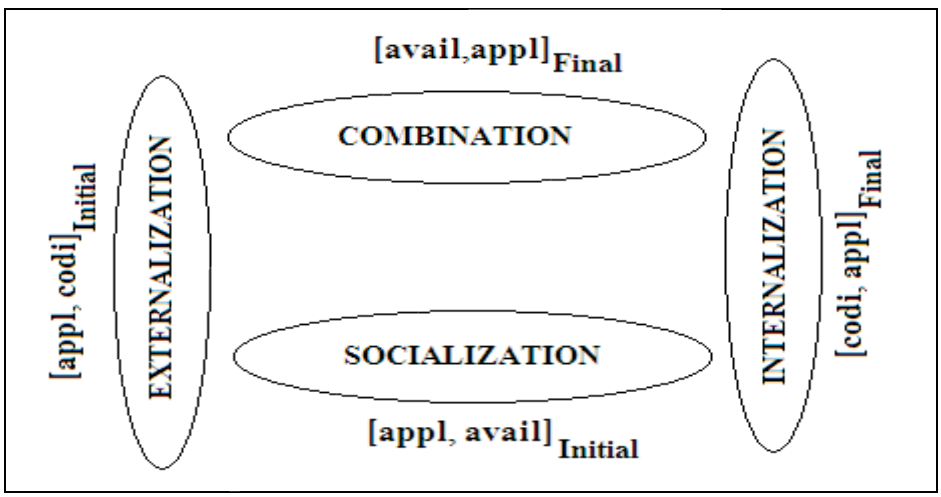

Figure 6 : SECI Occupation in four planes of I-K Space

Actually, we know an object in a space is detected by its coordinates i.e. here in the I-K Space the knowledge congenially derived from information with fluctuation in the I-K Space experiencing simultaneous and converged forces from the 3D concepts and we know that SECI model is construed to be operational tools in the matter of conversion of knowledge making it flexible instead of being static and the so called SECI model being 2D where knowledge would have been conceptualized as a suitable combination of tacit and explicit knowledge the introduction of 3D I-K Space further helps conceptualizing tacit and explicit knowledge in a more fragmented way like semi tacit and semi explicit knowledge so that the microscopic acid test of knowledge can be palatably made and used and applied appropriately.

Thus by introduction of concept of I-K Space we have been able to visualize the knowledge to be more flexible rather than to be static. Through introduction of I-K Space concept, introduction of new terminologies like semi tacit and semi explicit have been possible wherein it is clear semi tacit knowledge may be construed to be a tacit knowledge which can be transferred and as such eventually becomes available to groups of appropriate employees in an organization rather than staying with one individual. Of course, semi explicit knowledge is such type of knowledge which has lowest rating on the scale of availability and highest rating on the scale of

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codification. Here how through I-K Space transformation conversion of different forms of knowledge can take place is not being discussed because otherwise techniques and modus operandi have already been discussed previously so far as transformation of different forms of knowledge is concerned (save and except 'semi' conception) which has been discussed during elucidation of functions of KMO.

V. Knowledge Culture

In an organization to achieve knowledge culture is a work hard nut. In so many organizations it is noticed that the organizations possess knowledge infrastructure in place but it is lacking in having right culture in place. It is very difficult to build knowledge culture in an organization because most of the employees are found still not sure of the nature of the new knowledge asset and what leveraging that means to them. Carla O'Dell from the American Productivity and Quality Center *[6]* has confirmed that 'fewer than 10% have succeeded in making knowledge management part of their culture'. It appears that work of capturing knowledge by an organization is very difficult. Formation of knowledge community in an organization might help to build knowledge culture in an organization. It is nothing but conception of a group of people coming together for sharing common knowledge of interest amongst them. It has become a common fashion that most of the organizations are seen to have encouraged their employees to become members of a knowledge community sharing knowledge amongst them. Of late, even World Bank in order to brass up the knowledge management abilities of its employees to a booming point are reported to have encouraged forming knowledge community associated with knowledge culture. Actually, the following strategies have been prescribed by McDermott and O'Dell [7] in the matter of creation of knowledge sharing culture do support a committed project champion, do provide a reward and reorganization system to the successful employees, make a visible link between sharing knowledge and business objectives, do provide adequate resources to encourage human networks of knowledge sharing, do encourage 'boundary-spanning' individuals who are capable of translating knowledge and experience from one group to another and link knowledge sharing with widely and profoundly held core values.

To achieve, as such, success in knowledge management; coherence between tools and environment must be obtained. Technological blocks founded on Information Technologies must have an 'acceptability' level very high for the users of knowledge management. It is not a problem to give tools for supporting the processes in an organization but it is a colossal problem to give tools for creating new knowledge, for sharing know-how etc. Now-a-days the 'information Component' has lost its essentialities. Through the knowledge management systems implemented concerned people must strive to create in their own new tacit knowledge, try to invent new know-how, operational techniques which would give grand success and decisive competitive advantages to the organization recognizing honestly their valuable contribution.

VI. Sampling Strategy on Knowledge Management and Defect Detection

So far the discussions on several angles centering knowledge management have been based on theoretical level. If in the practical scenario attempts be made to ascertain as to how application of successful knowledge management in different organizations is fetching desired result a detail survey covering different types of organizations, regardless of their dimensions, is definitely needed. Obviously since it is not possible (and it is also not done) to collect data from all organizations attempts may be taken to take recourse to that what can be called 'Sample Survey'. Researchers to be vigilant to pick up samples so that result so produced from the sample may not differ from the result that would be obtained if all the units of organizations for assessment of success in the matter of applicability of knowledge management would have been taken up. Therefore focus to be given to correct distribution towards picking up sample (organizations). For picking up samples researchers must be very vigilant to minimize error which is otherwise criticized as weakness [*Wunsche, 1986]*. For adoption of sampling strategy in the matter of ensuring the success of knowledge management in organizations so many formulae are in existence. Conveniently researchers may use the formula propounded by Cochran *[Cochran, 1977]* which is otherwise simple comparatively to apply for knowledge management application along with defect detection and nullification thereof. The formula is of the form:

Sample Size = (Selected **α** *level) 2 (SD) 2 (Acceptable margin of error) -2*

Here **α** level means quantifiable willingness of the researchers to report a mistake committed out of inadvertence to accept the true margin of error exceeds the acceptable margin of error [Bartlett et al, 2001]. Now usually the **α** level used in most of the research studies is taken to be either 1/100 or 1/20. Actually substituting the actual values in the above equation let us suppose that we get

Sample Size = **ξ**

Now usually it is advisable for picking up small and medium enterprises (SME) in the matter of collection of data concerning to knowledge management activities because such collection of data from SME would tantamount to be a compromise in between big and small organizations so far as

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applicability of knowledge management is concerned to those organizations. If then the number of organization (SMEs) = N (say)

And if 5% of N > ξ Cochran proposed that the number of organizations to be considered for sample survey should be considered to be ξ.

But if 5% of N < ξ, Cochran proposed that a correction formula is required to be used which is

Corrected Sample Size = ξ [1+ ξ N-1] -1

Actually this correction formula is used to reduce error because if the sample size is increased less will be the error in the result which can be visualized from the following graph.

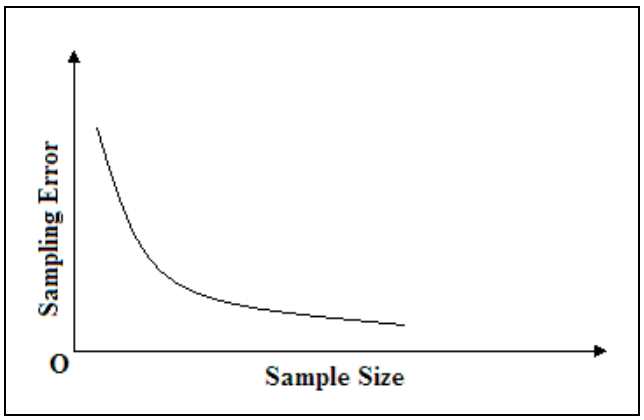

Figure 7 : Sampling Size vs. Sampling Error

To reduce defect in the outcome of result when assessing success of applicability of knowledge management in organization while conducting sample survey researchers should always keep in their mind that the respondents should not be embarrassed by putting wrong questions, the exaggerated answers from the employees of the organization are to be avoided, they (researchers) should not be otherwise prejudiced and the researchers should go to the organizations after making ready their mind set with proper questionnaires in the knowledge management perspective.

Above is an approximate overview to propose modus operandi of proper survey to tally what is the out come of actual survey in the matter of ascertaining success to fetch optimum result to an organization perpetually applying the knowledge management activity in that organization with the outcome of theoretical discussion so far made. Obviously here actual survey has not been taken up and actual data has not been collected which is left for further research works.

VII. Summary and Conclusion

In this paper proposal has been made regarding application of knowledge management in organizations and it has been discussed how knowledge management helps developing technological and strategic perspective of an organization. It has been ascertained that in an organization knowledge management is considered to be a capital having even economic value, it is considered to be strategic resource for increasing productivity, it is also considered to be a stability factor in an unstable and dynamic competitive ambiance and it is also considered to be a tool which can bring in decisive competitive advantages to an organization. It has been discussed herein how PDM, SCM, CRM and MIS can enrich the knowledge management style of an organization. How customer behavioral responses, performances etc can be improved have been discussed here and tools have been proposed. The tactics and tools relating to transfer of knowledge from one ramification to other have been discussed through mathematical/empirical form in the light of functions of KMO and also proposing I-K Space concept, attempts have been made to conceptualize knowledge in different microscopic fragmented forms like semi tacit and semi explicit knowledge and it has been discussed through proposal of I-K Space concept how, when application of knowledge is made properly, knowledge is codified properly and availability utilized in a pragmatic way knowledge management assumes a grand success in an organization to fetch optimal result. Also in this paper a suggestion has been given regarding modus operandi as to how; in order to ascertain parity of theoretical discussion in the matter of assessing success of application of knowledge management in organization is keeping pace with the practical result; survey for collection of data through sampling strategy can be easily conducted by the help of some mathematical formulae reducing commission of defects therein.

With much work remaining in this context, here through different discussions, figures, formulae attempts have been made to throw light on the fact regarding success of knowledge management in an organization which was hitherto, to some extent, not given proper and appropriate importance by the business leaders of organizations.

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Innovation in the Tea Industry: The Case of Kericho Tea, Kenya

By Dr. JaredO. Ongong'a & Mr. Albert Ochieng
Bondo University College, Bondo

Abstract - Innovation is noted to be a necessary ingredient for the sustained success of firms. It protects both tangible and intangible assets against the erosion of the market. In Kenya, the tea industry has been hit by a downward trend in prices against the backdrop of rising production costs, the highest being labour costs. Some tea firms in Kericho have initiated mechanical tea harvesting operations, in an attempt to mitigate the rising production costs and stiff competition. This has been undertaken as an innovative measure to ensure the success of the respective tea firms. Though the initiatives seem to play in favour of the owners of the tea firms, it has been met with mixed reactions, from varied centers. First, there is incongruency between the factories processing capabilities and the availability of mechanically harvested leaf. Second, there is a feeling and resistance amongst the labourers, that machines are likely to push them out of productive employment.

The major objective of this study was to establish effects of innovation on performance of tea firms in Kericho town Kenya. The study used both primary and secondary data from sampled respondents. The research was primarily a correlational where by Kericho town was representative because of the concentration of major multinational tea firms in the country. The population of the study comprised of a five major tea firms in Kericho town. A stratified random sampling technique was used. Results were analyzed using measures of central tendency like mean, mode and median to present qualitative findings. Regression analysis was used to establish the relationships between innovation dimensions and performance indications. The study revealed that innovative strategies adopted resulted into increased revenues, high productivity levels and reduced costs. The study therefore recommends the tea mechanical harvesting operations as an important method of adopting innovation.

Keywords : innovation, tea firms, tea industry.

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INNOVATION IN THE TEA INDUSTRY THE CASE OF KERICHO TEA, KENYA

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I. Introduction

A Product operationalizes both market technologies issues into a particular configuration of the four P's of marketing, product viz., price, position in the market and placement in distribution. A comprehensive definition may be unclear though it frames the development efforts, so that the innovators can fill in the details and operationalize the product into the physical configuration of attributes. This product concept enables them to learn because they can then fine-tune the idea or respond to market shift or mistakes in earlier knowledge development. Failed innovators work with an incomplete or partial product definition, so they are continually surprised by aspects of the product configuration that they have not conceptualized. With new products, too many factors emerge too quickly for the unprepared to respond to with a comprehensive product conceptualization innovators can continually assess the uncertainty of their efforts at least qualitatively and make an informed judgment, as to whether they should cancel the effort or shift to another more feasible market (Cynthia 1994).

The conventional meaning of the term marketing largely refers to new product related breakthroughs. As a result, the innovation focus in marketing literature has been relatively product intensive. Market orientation, however, involves not only improvements in product related aspects, but also facilitation of the administrative facets in an organization. This requires studying innovation with a broader scope and making the distinction between technology and administrative related innovations (Han 1998).

The role of an innovation system is to increase the efficiency of the innovation process. The system needs to move great ideas from concept to commercialization with speed and minimum use of resources. It is especially relevant for incremental innovation, where following a defined set of stages and decision points accelerates time to market and increases the return on resources invested. Innovation systems create the appropriate lines of communication within the company and with outside constituencies. As the innovation team demands specialized knowledge from other parts of the organization, systems facilitate timely access to it. They align the objectives of various constituencies. People throughout an organization need to understand the company strategy and its implications for operations. They also align organizational objectives with personal objectives. The information regarding the innovation performance needs to be communicated and compared with innovation objective (Davila, 2006).

a) Statement of the Problem

Since 2004, tea firms in Kericho have been adopting innovative strategies in creating product design and in production technology with hope of improving their productivity. In spite of this innovation, little is known regarding the extent to which innovation

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impacts on the performance of the tea firms in Kericho. This study therefore investigated the impact of innovative strategies on tea firms' performance. Some of the innovative strategies could have serious negative impacts on the living conditions of the people in the tea industry. For example, there could be mass unemployment, redundancies and accelerated poverty due to some of the innovative strategies. Innovation is a necessary ingredient for sustained success of firms. It protects both tangible and intangible assets against the erosion of the market. Innovation too is an integral part of the business and as such it has to be managed.

b) Research Objectives

The overall objective of this study was to establish effects of innovation on the performance of tea firms in Kericho town, Kenya. Specific objectives of the study were to:-

i. Identify innovative strategies adopted by tea firms in Kericho, Kenya.
ii. Establish the extent of implementation of innovative strategies within Kericho tea firms.
iii. Determine the effect of innovation on performance of the existing employees of tea firms in Kericho, Kenya.

c) Research Questions

i. What are the innovative strategies adopted by tea firms in Kericho?
ii. What is the extent of implementation of innovative strategies within Kericho tea firms?
iii. What are the effects of innovation on performance of the existing employees of tea firms in Kericho, Kenya?

d) Scope and Limitations

The study covered 3 tea firms in Kericho. Due to the financial constraints, the study concentrated in Kericho town to represent the tea firms in Kenya.

e) Justification of the Study

Innovation is the new cost driver in the tea industry. Results of this study will provide investors in tea business with information on which they could benchmark to ensure customers get quality services. The findings in this study will be useful to academicians in expanding knowledge on relevance of innovation in the tea industry. Once the tea firms use the findings to improve their service provision customers will benefit by getting value for their money. Professionals in the tea industry will also know on which innovative strategies dimension to concentrate their efforts for maximum benefit. It is widely acknowledged that technology change and innovation are major drivers of economic growth and lie at the very heart of competitive process. Since the pioneering study of Solow (1957) the contribution of technological change to economic growth has been estimated by an endless number of contributions aiming at squeezing the residual using additional production factors related to technological knowledge. The relationship between technological change and economic performance has represented the research focus of another stream of literature in the neo - Schumpeterian tradition.

f) Conceptual Framework

Innovation is new combination of the production function; the major yard stick used to measure business success is increased revenues and minimized labour costs. This output, however, is achieved after the various inputs in organizational innovation in the tea industry undergo favorable business competition. The inputs in the tea business in this regard include, new technology of harvesting tea, highly skilled manpower, new production technique. Thus, the tea business output, in this case is denoted by more revenues generated, minimized labour costs and operational costs, and increased overall output, is a function of how these business inputs interact. It means an innovation system that is efficient increases the innovation process. This study seeks to establish the kind of relationship existing between innovation and organizational performance in the tea industry. Profitability levels are influenced by how organizational innovation inputs interact as presented by figure 1 below:

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The figure illustrates how dependent/independent variables and intervening variables create impact.

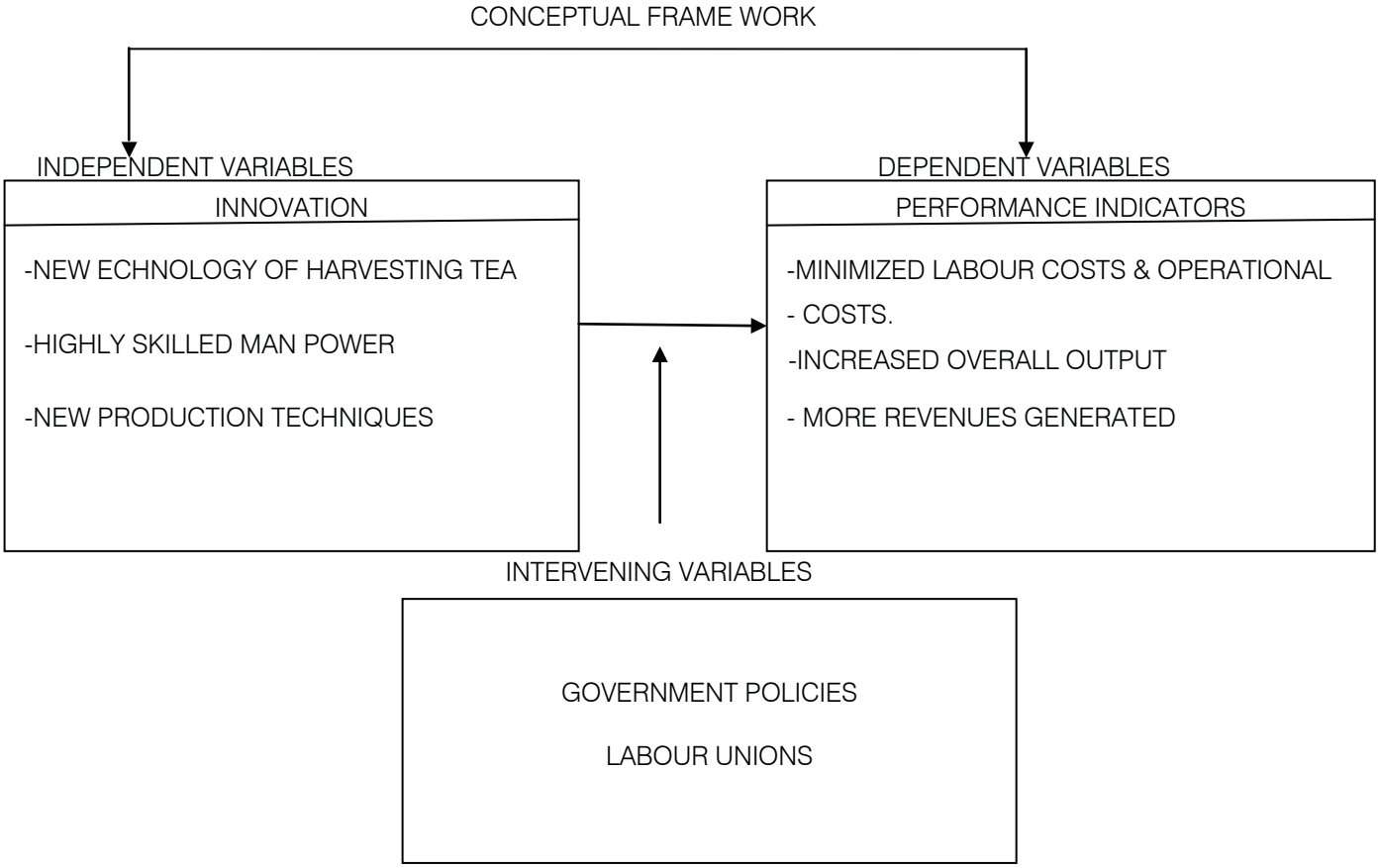

Figure : Dependent and Independent variables

Source : Authors'

The figure shows the relationship between the dependant variable (minimized labour costs and operational costs, increased overall output, and more revenues generated) and independent variable (New Technology of harvesting tea, highly skilled man power, and new production techniques. The impact of organizational innovation on firms performance illustrates the following relationships. The dependent variables are influenced by the independent variables to achieve tea firms performance in the tea industry as a result of innovative strategies. The more the tea firms adopt innovative strategies in terms of New Technology adopted to harvest tea leafs as opposed to manual labour, it leads to increased overall output as a result of minimized labour costs as a cost cutting measure. The cost of hiring labour, would be a reduced lean and efficient labour force highly trained and well remunerated. Tea firms would find it economical and cheaper to use mechanized plucking methods than manual labour. But above all the intervening variables would oppose mechanized Agriculture, because Government policies would see this as a way of multi-national tea firms pushing tea labourers out of productive employment, and hence losing a source of income.

a) Customer Orientation

Some researchers consider customer orientation as important as competition focus and inter-functional coordination (Narver and Slater, 1990), others consider it the most fundamental aspect of corporate culture (Deshpande, Farley and Webster, 1993) demonstrated a positive correlation between customers orientation an d innovative firms, but they do not make the distinction of whether the firms are innovative in technical or administrative aspects. Organizations committed to superior customer value, however, have been shown to be innovative throughout their entire business system as opposed to solely in products or services (Parsons, 1991).

b) Competitor Orientation

Customer focus might play a key part in the strategy to create superior customer value, but an effective strategy requires more than simply customer-centered methods. Day and Wensley(1988) propose that a balanced mix of customer and competitor orientation is a requisite for maintaining a competitive

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advantage in the Market place, which is consistent with Narve and Slater's (1990) equal weighting of market orientations core components. The link between organizational innovation and performance stands as the most concordantly documented part of the postulated market-orientation, innovation, performance chain.

The rational behind organizational innovativeness showing a strong, positive influence on performance is ascribed to innovations that solved to accommodate the uncertainties (market and technological turbulence) a firm faces in its entrepreneurial environment (Ettlie and Bridges (1982). Accordingly technical innovations have a positive direct impact on performance. In Damanpours (1991) P 560, conceptualization, technical innovations pertain to products, services and production process technology, they are related to basic work activities and can concern either product or services.

c) Performance Indicators

The key performances indicators shall include minimized labour costs, increased overall output, more revenues generated. Technological change in agriculture is essential to reducing poverty, fostering development, and stimulating economic growth in many developing countries. Hence, the identification of how investments in and policies for improving agricultural education, research, and extension can efficiently promote technological change is an important issue for both researchers and policymakers (Alston, Pardey, and Taylor 2001; Alston, Norton, and Pardey 1998).

II. Literature Review

A critical issue facing companies today is how to create and maintain a sustainable competitive advantage within a turbulent and complex business environment, often in a turmoil, facing an unpredictable and unstable future. The industrial organization theory which emphasizes barriers to competition and the resource-based view, which suggests that firms are fundamentally idiosyncratic. As a consequence of the increase in complexity and turbulence in the business environment, there is a need for a more immediate response to changes in customer needs. Archibugi and Michie argue that contemporary economic systems have become more knowledge-intensive than in the past. Continuous changes in the state of knowledge produce new disequilibrium situations and therefore, new profit opportunities, and they do so at an increasing pace. Unfortunately for m any companies, so does imitation, creating a dynamic competitive process. Thus, as the competitive process eliminates an opportunity, changes in the stream of knowledge produce other opportunities.

According to Shelton et al (2006), Innovation has experienced a remarkable change in recent years as a consequence of a number of factors including the advance of science and technology and the increasing globalisation of a number of markets and activities. The growing heterogeneity of sources affecting the process of firms' innovation has led to the knowledge created out of the companies themselves achieving greater importance, and therefore to the central role to be played by the capacity of integrating inner and outer sources of technological capabilities with other competitive forces. Similarly, the acceleration of internationalisation at most economic and social levels has increased the necessity for exploiting firms' advantages at international (sometimes world) level and seeking new competitive (technological) assets in a multinational framework. Moreover, the specialised research has reached a common conclusion that sectoral features have a remarkable influence on the possibilities and organisational modes of innovatory activity.

The pioneer of innovation theory Joseph A. Schumpeter believes that innovation is a new combination of the production function, the purpose of which is to obtain potential excess profits. Innovation can be summed up into five types: (1) producing new products, (2) introducing new production methods and new process, (3) exploiting new markets, (4) developing new raw materials or semi-manufactures supply sources and, (5) introducing or redesigning new organization. Since then, researchers have put these five innovation forms into two categories, with the former four referring to technological innovation, and the fifth one referring to organizational innovation. Further, Nelson argued that technological innovation involves not only the first time introduction of new technology, but also the diffusion of technology, and such diffusing process depends greatly on the accumulation and development of all kinds of knowledge. In this paper, the analysis of innovation in SMEs covers both technological innovation (i.e. generation of new technology, and its use and diffusive process) and organizational innovation (i.e. reconstruction of clustering elements or resources, or a new organizational configuration, and achieving re-selection and optimization of strategic goals through the sharing of knowledge, networking and collaboration).

On the other hand, the significance of the spillovers of knowledge from external sources has been increasingly recognized in the process of innovation and economic development. A number of literatures suggest that knowledge spillovers are centered on spatial proximity such as industrial clusters, and that a wider and faster diffusion of knowledge spillovers can be achieved by actively stimulating cooperative relationships or motivated by several economic actors including local government, intermediary networks, (Feldman 1999, Krugman 1999, Breschi and Lissoni 2001).

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a) Organizational innovation strategy

According to Davila (2006) a company's innovation strategy needs adjustment over time. A number of internal and external factors affect the selection of the best innovation strategy. These affect the choice of the innovation strategy and the shape of the portfolio or play to win or play not to lose. The purpose of innovation is to create business value. That value can take many different forms, such as incremental improvements to existing products, the creation of entirely new products and services, or reducing costs, etc. The reason to do this is because we want our enterprise to survive, and to grow, and in a rapidly changing market the only way to do either is to innovate effectively. In the history of business, it's clear the effective innovators have a better chance of surviving, and non-innovators tend not to survive at all. The method of innovation is to develop ideas, refine them into a useful form, and bring them to fruition the market where they will hopefully achieve profitable sales, or in the operation of the business where they will achieve increased efficiencies.

i. *Internal Factors*

Technical capabilities-The amount of technology innovation depends to a large extent upon the current capabilities that the company has internally or can access through its innovation network. A company that has traditionally competed on its marketing skills and incremental technology improvements will have a tough time suddenly including a semi radical technology dimension to its strategy (Mark J, 2006).

First, Organizational capabilities -the ability to nature innovation also depends on whether the company has the organizational capabilities to do it than shifting to a more radical innovation approach will not happen if the organizational and management capabilities are not present. Secondly, Success of the current business model-the difficulty that successful companies have in changing has been repeatedly documented. It has been described as core capabilities becoming core rigidities or the inability to grow internal ventures in successful companies. The greater the success, the greater the potential resistance to change. Thirdly, Funding- having the necessary economic resources in an obvious, albeit sometimes forgotten, requirement. However too much funding may be as dangerous as too little. For example the start ups of the late 1990's and early 2000 were funded with a lot more money than they actually needed. The result was a waste, misallocation of resources chasing business models that were inadequately tested. A less generous funding environment forces innovation teams to carefully plan and test the assumptions of the model before scaling up top management Vision- The last internal factor is top managements vision. Management has a large set of options to position, the company and managements talents has a very relevant role in selecting and evolving the company's innovation strategy (Jin, K 2006).

ii. *External Factors*

Internal factors are not only formative forces, external forces can also shape the innovation strategy. Capabilities in the external network - Accessing relevant capabilities is crucial.

Development of new technology or business models usually requires collaborations with other organizations that have complementary resources, for this you need a network that reaches inside and outside of your organization. The ability to create sustainable alliances to create sustainable alliances with these partners become important in deciding the innovation strategy going forward.

According to Olaisen (1997), industry structure is an important factor. A careful analysis of this structure points out where the main obstacles and opportunities for innovation reside. Understanding the dominant industry value chain, who dominates and why, and the structure of the barriers to entry are important inputs to the design of an innovation strategy.

Competition, which refers to the quality and speed of innovation of the competitors as well as own innovations will determine the shape of the market in the years to come. While own organization may be well positioned in the current market, competitors could change or new competitors could enter especially if the competitive dynamics change drastically. Useful Questions usually include: do strategies of the competitors open any doors for one to adopt a plan to win approach? Does their approach make a play not to lose strategy relatively attractive? Without a clear innovation leader present in the arena, is an outsider likely to jump into the game and change the rules? Rate of technological change: As the world becomes technologically advanced, the file of a product will become shorter and shorter when new advances outdate your product, it is important to identify the change approaching before your product goes stale. Successful long term products can sometimes blind companies to new trends that will ultimately be picked up their competitors, the competitor's dilemma updating and improving your company's innovation strategy must address these elements. However no formulae will yield the best strategy, each company is unique even though they may share the same competitive environment (Daniel, J 2004)

What is considered a threatening situation for one company, resulting in a play not to lose strategy could be considered an opportunity for another. When deciding what innovation strategy to pursue, risk management comes quickly to mind. Assuming that no significant disruptions occur to the competitive arena, as

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we move up and right on the innovation matrix, the level of risk that we take is higher (Davila, 2006).

For companies intent on leading and changing the industry the centre of gravity of investment will move more towards the semi radical and radical changes innovation quadrants. These companies rely on being first and creating value through larger steps of technology on business model innovation. However, in order not to increase their risk unnecessarily, these companies invest enough in incremental innovation to be fast followers and quickly assimilate the little steps that their more conservative players take. The centre of gravity and the breadth of the innovation portfolio determine the level and type of risk that needs to be managed during execution (Michael et al, 2002)

b) Organizational Innovation and Performance

According to Hitt (2002) the current literature on organizing for innovation as part of the entrepreneurial/management contains at its heart a contradiction. A number of authors have argued that innovation requires a different kin2 of organization than administrative management. The organization needs to empower individuals to act on opportunities (Amit Brigham and Markman, 2000). They need to develop the cellular organizational form in which each cell shares characteristics with the other cells. But a research stream with many different sources both old and new argues that these characteristics cannot co-exist with the traditional organization.

Burns and Stalker (1961) argue that organizations cannot be both organic and mechanistic. Ghemawat and Ricart Costa (193) argued that an organization cannot be efficient in both a static sense and dynamic sense. March (1991) argues that organizations must trade off gains in average performance through "exploration" similar to discovery or entrepreneurial management against the reduction in variance in returns gained through "exploitation (similar to coordination, or administrative management). Organizational learning increases the return to exploitation in the short run but is likely to weaken overall returns in the long run. According to Georgellis, (1999) entrepreneurial organizations in the private and public sectors have been the subject of increased attention over the last two decades.

Subscribing to the Schumpeterim view that careful management alone does not address the requirements of competitive system previous studies focused on innovation as offering the best prospect of theorizing an entrepreneurial organization. As Schumpeter (1951) argues, innovation and investment that enable business to be blazing new trials are crucial for business success. Without innovation, automatic decline is inevitable. The argument has been carried into the present period by Drucker (1985), who highlights the importance of innovation as a key characteristic of an entrepreneurial business. Previous studies examining the relationship between firm size and diffusion of innovation find that small firms may lag behind large firms in adopting innovations owing to required critical, threshold firm size that will make innovations profitable. (David 1969, Davies, 1979).

According to Georgellis(1995) in early 1990's there was a renewed interest in mapping organizational processes in an effort to design more efficient and streamlined processes that will help organizations to achieve breakthrough in reducing costs and increasing productivity. This was often seen as especially useful for large business and multi-national corporations that had become operationally flabby (Hammer and Champy, 1993; Johnson et al, 1993). This pre occupation with operation al effectiveness however coincided with a renewed interest in innovation as a source of competitive advantage (Porter 1991, Hamer and Prahalad, 1994) it seems therefore that innovation management can concentrate on the engineering processes to improve operation or it can concentrate on new products and services.

From the foregoing it is evident that innovation is a necessary ingredient for sustained success of firms. It produces changes that are essential to the survival of a company. Since 2004 tea firms in Kericho have adopted innovative strategies in creating product design and production technology with a hope of improving their productivity. Despite these efforts, very little knowledge currently exists with regard to the effects of innovation on employees within the firms. The current study therefore is an attempt to unveil these effects i.e. if they do exist.

III. Methodology

This section dealt with the methodology used and various techniques used in data analysis and results presentation.

a) Study Areas

i. *Kericho Town*

Kericho town is situated in the famous rift valley province, Kenya. It is a tea growing zone, over 70% of the population is engaged in agricultural activities mostly as small-scale farmers. Three multinational ten firms namely James Finlay's Kenya Limited, Unliver Kenya limited & George William son Tea Company Limited was selected randomly according to their performance for the study.

b) Research Design

This was a two month study which involved correlation analysis investigations and both quantitative and qualitative data was collected from primary and secondary sources. Data was collected in Kericho town specifically from James Finlays Kenya Limited, Uniliver Kenya Limited and George Williamson Tea Company

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Limited. Structured questionnaires, key informant interviews (KII) and observation guides were used to determine the relationships between innovation and performance in the tea obtained in the tea industry. Secondary data was obtained from internal company reports, journals, and company newsletters, to supplement primary data.

c) Study Population

There are five major tea firms in Kericho town involved in large scale tea production. Namely James Finlay's Kenya Limited, Uniliver Kenya Limited, Sotik Highlands produce Company Limited, George Williamson tea company limited based on their performance output.

d) Sample Size

The sample size was determined from the respondents working in major multinational tea companies, managers &employees in Kericho town, Kenya, who gave their informed consent to participate in the study. The sample size was derived from the target population with in tea firms in Kericho based on their past performance. This was 21 respondents

e) Data Sources And Data Collection Methods

Primary data was collected using structured questionnaires, key information interviews and observation guides were used and collected from estate managers in the plantation fields and labourers. Secondary data was also collected to supplement primary data through company internal reports and News letters.

f) Data Analysis And Presentation

Quantities data analysis was aided by statistical package for social science (SPSS). Data analysis was done using measures of central tendencies like means mode, and medium to present qualitative findings. Percentages were used to convert qualitative information into numerical format.

IV. Results And Discussion

a) Organizational Innovation

i. *Technology*

Table 4.1 : Development of new Technologies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NOT AT ALL	4	13.3	13.3	13.3
	TO A LITTLE EXTENT	5	16.7	16.7	30.0
	TO A MODERATE EXTENT	6	20.0	20.0	50.0
	TO A GREAT EXTENT	9	30.0	30.0	80.0
	TO A VERY GREAT EXTENT	6	20.0	20.0	100.0
	Total	**30**	**100.0**	**100.0**	

Source : Field Data

From the table 4.1 above, the respondents were asked about the effect of their respective firm's innovativeness on development of new technologies. The tea pickers responded as follows: 30% to a graet extent agree innovativeness affect development of new technologies while 20% to a very graet extent agree and 20% to a moderate extent agrees while 16.7% to a little extent agree while 13.3% do not at all agree.

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ii. *Adoption of new technologies*

Table 4.2 : Adoption of new technologies

		Frequency	Percent	Valid Percent	Cumulative Percent
	NOT AT ALL	10	33.3	33.3	33.3
	TO A LITTLE EXTENT	9	30.0	30.0	63.3
	TO A MODERATE EXTENT	6	20.0	20.0	83.3
	TO A GREAT EXTENT	3	10.0	10.0	93.3
	TO A VERY GREAT EXTENT	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

Source : Field Data

From table 4.2 above, it is noted that adoption of new technologies, the majority 33.3% do not at all their firms are adopting new technologies despite their development. This is followed by to a little extent (30%), moderate extent (20%), a great extent 10% and a very great extent at 6.7%. The essential elements of innovation and adoption of new technology system include (a) a knowledge and education domain, (b) a business and enterprise domain, and (c) bridging institutions that link the two domains. The knowledge and education domain and is composed of the agricultural research and education systems. The business and the set of value chain actors and activities that both use outputs from the knowledge and education domain,and innovate independently. Between these domains are the bridging institutions—extension services, political channels, and stakeholder platforms—that facilitate the transfer of knowledge and information between the domains.

iii. *Use of information technologies*

Table 4.3 : Use of Information Technologies

		Frequency	Percent	Valid Percent	Cumulative Percent
	NOT AT ALL	8	26.7	26.7	26.7
	TO A LITTLE EXTENT	4	13.3	13.3	40.0
	TO A MODERATE EXTENT	7	23.3	23.3	63.3
	TO A GREAT EXTENT	5	16.7	16.7	80.0
	TO A VERY GREAT EXTENT	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

Source : Field Data

The respondents were further asked on the use of information technologies. The survey revealed that the firms' use of information technology is to a very great extent (20%), to a great extent (16.7%), to a moderate extent (23.3%) while 13.3% to a little extent acknowledge use of information technology in their innovation while 26.7% do not at all.

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b) Products

i. *Developments of new products*

Table 4.4 : Development of New products

	Frequency	Percent	Valid Percent	Cumulative Percent
NOT AT ALL	9	30.0	30.0	30.0
TO A LITTLE EXTENT	4	13.3	13.3	43.3
TO A MODERATE EXTENT	7	23.3	23.3	66.7
TO A GREAT EXTENT	8	26.7	26.7	93.3
TO A VERY GREAT EXTENT	2	6.7	6.7	100.0
Total	30	100.0	100.0	

Source : Field Data

In terms of product innovation, 30% of the respondents replied that they do not at all develop new products, while 13.3% to a little extent develop new products, 23.3% (moderate extent), and 26.7% to a great extent innovate for product development with only 6.7% deveping new products to a very great extent.

Table 4.5 : Increased Variety of Products

	Frequency	Percent	Valid Percent	Cumulative Percent
NOT AT ALL	4	13.3	13.3	13.3
TO A LITTLE EXTENT	9	30.0	30.0	43.3
TO A MODERATE EXTENT	6	20.0	20.0	63.3
TO A GREAT EXTENT	7	23.3	23.3	86.7
TO A VERY GREAT EXTENT	4	13.3	13.3	100.0
Total	30	100.0	100.0	

Source: Field Data

On whether innovation increases variety of products, the respondents agreed to a little extent (30%), moderate extent (20%), to a great extent (23.3%) and to a very great extent (13.3). Implicit throughout the system are farmers—both as consumers and producers of knowledge and information, as producers and consumers of agricultural goods and services, as bridging institutions between various components, and as value chain actors. Beyond the borders of the system, though nonetheless important, are influencing factors such as linkages to other sectors of the economy (manufacturing and services); general science and technology policy; international actors, sources of knowledge, and markets; and the political system.

ii. *New Packaging*

Table 4.6 : New packaging

	Frequency	Percent	Valid Percent	Cumulative Percent
NOT AT ALL	6	20.0	20.0	20.0
TO A LITTLE EXTENT	11	36.7	36.7	56.7
TO A MODERATE EXTENT	5	16.7	16.7	73.3
TO A GREAT EXTENT	2	6.7	6.7	80.0
TO A VERY GREAT EXTENT	6	20.0	20.0	100.0
Total	30	100.0	100.0	

Source : Field Data

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New packaging as innovation strategy has impacted on the products to a little extent (36.7%), to a moderate extent (16.7%), to a graet extent (6.7%) and to a very graet extent (13.3 and not at all to 20%.

c) Marketing

i. *Adoption of new marketing strategy*

Table 4.6 : Adoption of New marketing Strategy

		Frequency	Percent	Valid Percent	Cumulative Percent
	NOT AT ALL	7	23.3	23.3	23.3
	TO A LITTLE EXTENT	8	26.7	26.7	50.0
	TO A MODERATE EXTENT	3	10.0	10.0	60.0
	TO A GREAT EXTENT	3	10.0	10.0	70.0
	TO A VERY GREAT EXTENT	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

Source : Field Data

The degree of adoption of marketing technology is a crucial factor in the tea sector of the as the yield is concerned. A study was carried out to ascertain the present situation. Though the mean adoption level was 20%, Adoption level was positively correlated to education, number of dependents, labour use pattern, and subsidies and further, it was negatively correlated to performance.

ii. Organizational performance

Table 4.7 : Organizational Performance

		Frequency	Percent	Valid Percent	Cumulative Percent
	NOT AT ALL	4	13.3	13.3	13.3
	TO A LITTLE EXTENT	10	53.3	33.3	46.7
	TO A MODERATE EXTENT	3	10.0	10.0	56.7
	TO A GREAT EXTENT	4	13.3	13.3	70.0
	TO A VERY GREAT EXTENT	9	10.0	10.0	100.0
	Total	30	100.0	100.0	

Source : Research Data

Tea is among the most labour-intensive of all the plantation crops. It has both an agricultural and a manufacturing dimension. According to well-established precepts, 60 per cent of the income from tea is agricultural, the balance being of an industrial nature. A brief account of both the agricultural and manufacturing activities follows, with particular reference to labour absorption, with the aim of facilitating an insight into the kind of productivity gains that are possible in an effort to improve the viability of this sector. To a little extent as is shown by the 53.3%, organisational performance. this activity is overwhelmingly labour-intensive, despite the tendency lately in some areas of the region to use shear harvesters during the heavy cropping period when labour is scarce. Plucking accounts for about 70 per cent of the workdays on estates and about 40 per cent of the total cost of production.

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d) Competition

Table 4.8 : To what extent has Innovation Strategies Impacted on outdoing competitors in the Tea industry?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NOT AT ALL	7	23.3	23.3	23.3
	TO A LITTLE EXTENT	7	23.3	23.3	46.7
	TO A MODERATE EXTENT	8	26.7	26.7	73.3
	TO A GREAT EXTENT	5	16.7	16.7	90.0
	TO A VERY GREAT EXTENT	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

Source: Field Data

From the results, these factors combined with the growing recognition that agricultural innovation is far more complex and less linear than once believed—imply a need to refine the conceptual and analytical tools used to identify how policies and investments can best promote innovative behavior and practices in the agricultural sector, thereby promoting poverty reduction and sustainable livelihood improvements among the rural poor.

e) Labour

Table 4.9 : To What extent has tea firms been able to cut on labour costs as a result on using tea picking firms?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NOT AT ALL	9	30.0	30.0	30.0
	TO A LITTLE EXTENT	4	13.3	13.3	43.3
	TO A MODERATE EXTENT	7	23.3	23.3	66.7
	TO A GREAT EXTENT	4	13.3	13.3	80.0
	TO A VERY GREAT EXTENT	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

Source : Field Data

As of 21st June 2011, the company's shares had an average market value of kshs 91, and a dividend yield of 2.22%. The global share market value has stagnated between 13%-17% for the last 3 years. Although the introduction of tea plucking machines in the tea industry should reduce overall production costs, thus increasing revenue, Unilever Tea Kenya Ltd is not keen to embrace the new technology (opting to remain labour intensive), and this might make it less competitive in the industry. It therefore seems like the market value of their shares will remain stagnant, or might be headed for a tumble. However, the recent increase in rainfall should result in high tea productivity.

Table 4.10 : How has it affected the manual tea pickers who were laid off?

		Frequency	Percent	Valid Percent	Cumulative Percent
	NOT AT ALL	3	17.0	10.0	10.0
	TO A LITTLE EXTENT	7	13.3	23.3	33.3
	TO A MODERATE EXTENT	6	20.0	20.0	53.3
	TO A GREAT EXTENT	7	23.3	23.3	76.7
	TO A VERY GREAT EXTENT	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

Source: Field Data

The respondents either to agreat extent or a very great extent both at (23.3%) have been affected by the manual tea pickers who were laid off. Shears or machine plucking does not damage the leaf quality, the

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bush health or even the quality of made tea. In conclusion, mechanization of tea harvesting can reduce not only cost of plucking, but it can also increase the welfare of pluckers, give higher productivity per labor, decrease investment on labor housing, increase the efficiency in field activity and also solve the problem of availability of pluckers. Finlay's are more open-minded about the tea plucking machines, which should reduce their production costs. The innovation framework also includes reference to the frame conditions that foster or impede innovation, including public policies on innovation and agriculture; informal institutions that establish the rules, norms, and cultural attributes of a society; and the behaviors, practices, and attitudes that condition the ways in which individuals and organizations within each domain act and interact.

Revenues Generated

Table 4.11 : Revenues Generated

	Frequency	Percent	Valid Percent	Cumulative Percent
VERY MUCH DECREASED	11	36.7	36.7	36.7
IMMEDIATELY DECREASED	7	23.3	23.3	60.0
NOT CHANGED	7	23.3	23.3	83.3
MODERATELY INCREASED	3	10.0	10.0	93.3
VERY MUCH INCREASED	2	6.7	6.7	100.0
Total	30	100.0	100.0	

Source : Field Data

The main challenge of the companies is ensuring that there's enough water supply for the plantations. High rainfall in 2006 should serve to increase productivity – increase in rainfall and stabilization of the dollar will increase output and value of output, and therefore revenue should increase. Prospects of cutting down on plastic bag use would have a positive effect on the revenue of the company. Worker's trade union (supporting them in their fight against tea plucking machines) that have any negative bearing in their share prices and publicity. Operating profit increased by 7.7%, but net profit decreased due to increasing financing costs from the parallel manual harvesting and a high tax bill.

Table 4.12 : Labour Costs

	Frequency	Percent	Valid Percent	Cumulative Percent
VERY MUCH DECREASED	8	26.7	26.7	26.7
IMMEDIATELY DECREASED	7	23.3	23.3	50.0
NOT CHANGED	6	20.0	20.0	70.0
MODERATELY INCREASED	4	13.3	13.3	83.3
VERY MUCH INCREASED	5	16.7	16.7	100.0
Total	30	100.0	100.0	

Source: Field Data

Asked about the labour cost, firms generally agree harvesting all teas by hand would never have allowed tea consumption to grow as it has, since supply would not have been able to keep up with demand, and therefore costs would have remained high. Hand harvesting is, therefore, common in areas where there is a sufficient labor force that are properly trained to go into the tea gardens at harvest time and whose wages, while often high relatively to other professions in their local economy, are low enough to make the tea harvest still saleable at competitive prices on the open market (a delicate balancing act all companies face). Since the performance of an agricultural innovation system influences the overall performance of the agricultural

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sector, measuring sectoral performance is vital to assessing an innovation system. As discussed earlier, it is a researchable task to identify the relative contribution of the different components of the innovation to overall sector performance. The several agricultural sector performance indicators that are influenced by the performance of the innovation system, dividing them between those that are commonly accepted and used widely in the literature ("classical indicators") and those that are more oriented toward capturing aspects of innovation that are highlighted in the innovation systems literature, such as the demand orientation, learning processes, interactions and relationships, and informal institutions. (Rajendra, K 1998)

Overall Output.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY MUCH DECREASED	4	13.3	13.3	13.3
	IMMEDIATELY DECREASED	6	20.0	20.0	33.3
	NOT CHANGED	5	16.7	16.7	50.0
	MODERATELY INCREASED	8	26.7	26.7	76.7
	VERY MUCH INCREASED	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

Source : Field Data

According to the findings, the overal output has moderately increased (26.7%) much increased (23.3%), immediately increased (20%) while 13.3% and 16.7% were very much decreased or not in that manner respectively. This is as compared to 60-70 kg of green leaf per person per day with hand plucking. However, identifying the most promising investments and policy interventions in this field has become a more difficult task as the objectives have shifted from increasing outputs and yields to transforming agriculture into a more responsive, dynamic, and competitive sector. This shift has become increasingly relevant with the emergence of major structural changes in the global food and agricultural system, including the integration of agriculture into global markets, the emergence of consumers as key drivers of technological change, the growth of private investment in new agricultural technologies, and the revolution in information and communication technologies (World Bank 2006).

a) Summary of the Findings

The data obtained from various machines in tea harvesting estates vary depending on the make and experience of the operators. Approximate figures however indicate a harvest of about 400 kg of green leaf per day for a single-man hand-held machine, and of 1,000 - 1,500 kg of green leaf per day for two-man hand-held machine. This is as compared to 60-70 kg of green leaf per person per day with hand plucking.

Unlike in Kenya where introduction of tea harvesting machines was met with resistance from the onset, none of the estates which had adopted mechanical plucking in the Southern Africa region experienced any major hostility from labour towards mechanization. This is presumably because it was mostly being introduced in areas where people were not much interested in tea plucking - as opposed to Kenya where labour supply exceeds demand. Closer home, some farms in Tanzania have been experimenting with mechanical tea harvesting - small hand held machines and large track driven equipment - since mid-1980s.

Certainly, experts say that if trends across the globe are anything to go by, mechanical harvesting of tea is turning into a flood capable of breaking hard barriers, and may see wider adoption of the technology even in small scale units as more sophisticated machines find their way to larger estates with vast areas of tea on flat land. Even as parties in the Kenyan scene continue to discuss a more humane approach to the situation, pundits say that local tea pickers should nonetheless prepare to take advantage of emerging opportunities in the mechanized tea technology. Though the opportunities might not be as many as they might have been in the decades of manual tea picking, returns will nonetheless be higher for skilled labourers who will operate the more technologically advanced tea plucking systems.

According to the firms, leaf quality generally improves with better machines and proper adaptation. Provided quality is assured, machine picked leaves are just as acceptable as those that are manually harvested. Specialised tea harvesters are receiving attention in the industry globally. Unlike what is available in our tea

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zones, there are better machines that place tea harvesting on another level altogether. One such machine is the T1000 Magic Carpet tea harvester, designed to cover as much as one hectare per hour while floating over the tea bushes with precision and producing a better quality harvest. Technological evolution usually has an impact, both positive and negative. This is no different for the Kenyan tea sector. It is true that tea harvesting machines are taking over jobs and exposing thousands of workers to the pangs of the twin scourges of unemployment and poverty. On the other hand, mechanisation is, in the real sense, an evolution of cost-effective tea harvesting. However, the pros and cons of this technological advancement seem to have been blown out of proportion, resulting in a tug of war between the concerned parties. Since mechanical harvesting of tea is still in its infancy in Kenya, most plantations adopting the technology are using simple hand-held harvesters. It is a difficult start and is expected to affect the quality of tea. The type of firm's according to the distinction between local and multinational is very much in accordance with previous works (Molero & Garcia, 2008), our results do not find extraordinary differences between companies belonging to national or multinational groups.

Tea is an essential item of domestic consumption and is the major beverage in Kenya. Tea is also considered as the cheapest beverage amongst the beverages available in Kenya. Tea Industry provides gainful direct employment to more than a million workers mainly drawn from the backward and socially weaker section of the society. It is also a substantial foreign exchange earner and provides sizeable amount of revenue to the State and Central Exchequer.

The easing of human labour through the use of technology began in prehistory. The historic process of mechanisation has progressed from the most elementary force-transmitting devices such as levers to today's sophisticated information-processing machines. Throughout this progress, however, the constant purpose has been to supplement or complement human efforts in work.

During the last two years, the application of harvesting machines in tea production has been one of the outstanding developments in the tea sector. Wherever this (agricultural mechanisation) has been successfully implemented, the burden and drudgery of agricultural work has been greatly reduced while the output per worker (labour productivity) has been greatly increased. In the industrialised world, the mechanisation of tea agriculture released millions of workers from agriculture, enabling them to work in other industries and thus contribute to industrial expansion. Tea harvesting may be looked at from different points of view. From the mechanical point of view, agricultural mechanisation may be described as the replacement of human labour with mechanical power. In as much as agriculture is an economic activity, the mechanisation tea harvesting can also be seen in economic terms to be there placement of labour with capital. From the farmer's point of view, agricultural mechanisation may be described as the proper choice and use of agricultural equipment from among the available alternatives or, in a manner.

Harvesting machines imported from more developed countries would generally have been manufactured at higher labour costs and possibly sold at higher profit margins than those prevailing in a less developed country that imports the machines. This is probably a major reason for the recent trend of the more developed countries exporting factories rather than products to some less developed countries, in order to cut production cost. The importation of machines will probably necessitate the importation of the spare parts that will be required in order to maintain the machines in operation. It emerged that not to mention the cost of the spare parts, probable delays in the acquisition of the spare parts from their distant origins would lead to long machine downtimes, perhaps at times when the use of the machines is most crucial. The farmer without a machine is better off than the farmer with a machine that is broken down, cannot be repaired, and therefore cannot be used.

V. Recommendations

The association between human capital (personnel) and the innovation changes has mixed signs: positive for product innovation and negative for labour process. All the remaining factors maintain the same sign in both cases. Mechanised agriculture requires substantial capital investment that calls for proper management but also provides the firms more time to attend to management issues. Therein lies the mental challenge. Finally, from the point of view of those who work in agriculture, there are affective reasons that could compel them to opt for mechanisation, such as the satisfaction and prestige that comes with the ownership and use of modern equipment.

There is need for reorganisation of the Kenyan tea harvesting and farming system in general requires consolidation of the small farm holding into larger ones. The end result would be to root out small-scale farming and make place for a system of larger, mechanised and economically viable farm holdings. Though this option may be economically sound, in the short term it is likely to be politically unacceptable and close to being socially immoral. For most rural Kenyans small-scale farming is not only the only means of livelihood, it is also a traditional way of life that they would not want to abandon. Moreover, even for those who would be willing to give up small scale farming, there would still be the problem of finding a new occupation. However, for the long term, this option should still be worth considering.

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Although a number of qualifications must be introduced regarding the organisation of innovative process, our study finds more similarities than differences regarding the innovatory efficiency. Thus notwithstanding, we find out some differences for companies which are not members of a group(regardless of its nationality) particularly in sectors named as "traditional" or of low to medium technological intensity.

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Prospects and Challenges of International Financial Reporting Standards to Economic Development in Nigeria

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Abstract - The goal of financial reporting is to make information available for decision making. Historically, there is diversity in financial reporting in different countries due to culture, legal systems, tax systems and business structures. International financial reporting standards (IFRS) harmonises this diversity by making information more comparable and easier for analysis, promoting efficient allocation of resources and reduction in capital cost. Rational utility maximation is the theoretical foundation on which this paper is rooted. The IFRS components are disclosed, the benefits and challenges together with the roadmap of its adoption in Nigeria are highlighted for the economic development of Nigeria.

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PROSPECTS AND CHALLENGES OF INTERNATIONAL FINANCIAL REPORTING STANDARDS TO ECONOMIC DEVELOPMENT IN NIGERIA

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I. Introduction

Prospects and challenges of the International Financial Reporting Standards (IFRS) to Economic Development in Nigeria call for a background knowledge of IFRS, the theoretical foundation or basis on which it is rooted, empirical studies on financial reporting, definitions and components of IFRS Financial Statements, Nigeria's adoption and implication of IFRS together with the benefits and challenges of IFRS.

According to Essien-Akpan (2011), as a result of increasing globalization and therefore competition, it becomes imperative that countries and companies alike address issues that will make them become more attractive of investors capital which is like the proverbial beautiful bride. Capital market trades (crossborder listing) have gone global and a company can raise funds on several stock exchange around the world. Information which is IFRS per ce, provide a key to this. The goal of financial reporting is to make information available for decision-making. Diversity in financial reporting in different countries arises because of the differences in legal systems, tax systems and business structures. The IFRS is intended to harmonise these diversity by making information more comparable and easier for analysis, promoting efficient collaboration of resource and reduction in capital cost.

II. Background to IFRS

Ajibade (2011) disclosed that in1973, the International Accounting Standard Committee (IASC), the professional accounting bodies of major countries comprising UK, Ireland, United States (US), Australia, Canada, France, Germany, Japan, Mexico, Netherlands agreed to develop a uniform set of accounting principles that would be applicable globally and supersede the International Accounting Standards (IAS) which allowed for different treatments of transactions and events making comparative analysis difficult. Membership of IASC expanded to 140 professional bodies including the International Federation of Accountants (IFAC) under which Nigeria belongs. Because of globalization and to address comparability issues, IASC was restructured leading to the creation of International Accounting Standard Board (IASB) that issues IFRS.

III. Theoretical Framework - The Rational Utility Maximization Theory

The theoretical basis of this paper is the Rational Utility Maximization Theory. Marnet (2008) emphasized that this theory evoke the presence of calculating utility maximizer who would not succumb to what presumably amount to irrational behaviour. Furthermore, many conventional means for improving corporate governance depend on the premise that business managers are strongly rational agents with long-term horizon.

Freeman (1957) also disclosed that the rational maximization theory is based on the following assumptions:

i. The individual is self-interested maximizer;
ii. Has stable and consistent preferences or taste;
iii. Capability of rationale choice behaviour in accordance to certain decision rules (axioms);
iv. Independent/neutral monitors (gatekeepers) motivated by reputational and legal concern to withstand pressures.

However, observed monitors/gatekeeper behaviour appears to be odd in contrast to these assumptions of self-interest and rationality. Logic, for example, would predict that a gatekeeper (i.e auditors) would not sacrifice reputational capital for small amount of financial gains. Yet gatekeepers (auditors) have been observed to jeopardize their reputation for financial gains that were far smaller than potential losses. The obvious answer/ about why management including

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directors engage in fraud and gatekeepers (auditors) were complicit is that they did so because it was profitable to them or at least appeared to be so.

Adeside (2008) argued that corporate governance corporate code violator connive or evade the regulators through fraudulent mechanisms whereby principally, the audited financials sent to the Central Bank of Nigeria (CBN) is usually profit-oriented since it is that same audited account that would be published showing bogus profit in order to make their shares attractive at the capital market after a compromised approval have been obtained from the CBN. For the same accounting period, the audited account that would be forwarded to the Nigeria Deposit Insurance Corporation (NDIC) would have a depleted deposit base for the bank to pay an inconsequential 1% insurance premium to NDIC. For the same accounting year too, the audited accounts that is sent to the Federal Inland Revenue Services (IFRS) would have a reduced profit so that these banks would not pay any corporate tax to the coffers of the Federal Government of Nigeria while at the same time concealing withholding tax and value added tax (VAT) deductions thereby defrauding the federal government of Nigeria of revenue due it for economic development.

Akpan-Essien (2011) stated also that the adoption of the IFRS will ensure transparency, accountability and integrity in financial reporting necessary for addressing the crisis in the financial sector in Nigeria which was responsible for the Nigeria loss of the Foreign Direct Investment (FDI)in the oil and gas sector to countries such as Ghana that have begun oil production in commercial quantity and who are perceived to have better financial reporting standards in place.

IV. Empirical Studies of the Significance of Financial Report to Economic Development

Portes and Rey (2005) in their studies showed that most stock market investors prefers domestic asset but despite this, a geographical pattern of international asset transaction proves that financial information is not equally available to all market participants but where they are readily available in easily understood format, there have been significant consequences on the level of investors activities. UNCTAD (2001) report shows that FDI inflow to Africa declined by (9%) between 2010 ($50 billion) and 2009 ($55 billion).

Mangena and Tauringana (2006) in their studies also provided firm level evidence for a sub-saharan African country, Zimbabwe, of positive effect of governance on the fraction accounted for by Foreign Share Ownership of companies. They contended and postulated that because greater disclosure reduces information asymmetry for foreign investors, there should be a positive relationship between foreign share ownership in a listed company and firm level disclosure, especially due to the fact that the foreign investor portfolio are usually minority shareholders and therefore more susceptible to expropriation by local managers or controlling shareholders. They investigated foreign share ownership in Zimbabwe by examining whether differences in foreign share ownership (i.e. percentage shareholding owed by foreign investors) across companies listed in the country's stock exchange are related to the country-specific difference in disclosure and corporate governance mechanisms.

The study reports that foreign share ownership is positively associated with high standard of disclosure and audit committee independence.

V. Components of IFRS Financial Statements

Alistair (2010) defined IFRS as a series of accounting pronouncements published by the International Accounting Standard Board (IASB) to help prepare financial statements throughout the world, to provide and present high quality, transparent and comparable financial information.

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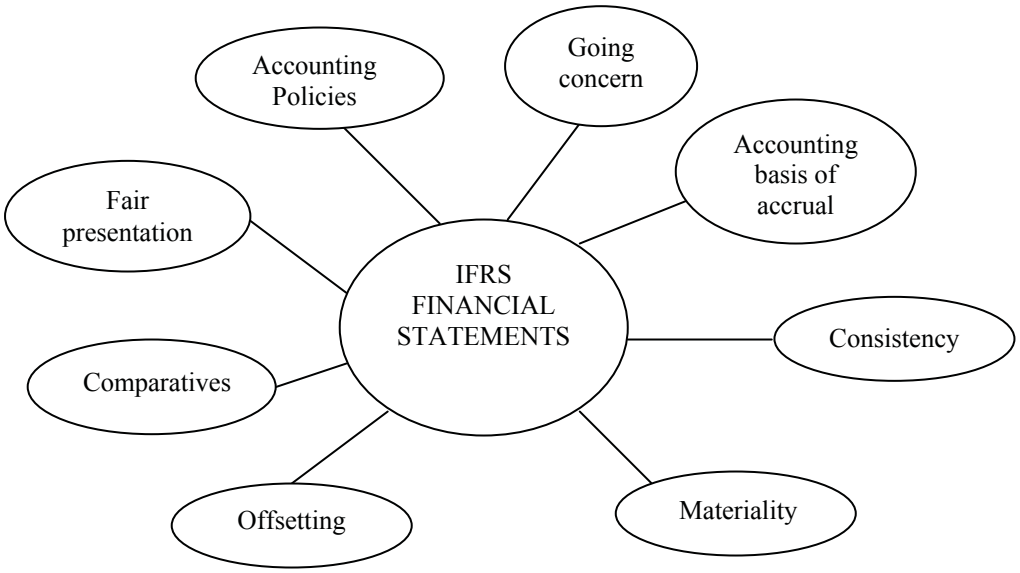

Source : Essien -Akpan (2011) International Financial Reporting Standards: The Role of Chartered Secretaries and Administrators : A Presentation at the 35th Annual Conference of the Institute of Chartered Secretaries and Administrators (ICSAN). Ikeja: Sheraton Hotels and Towers. October 26th – 27th.

According to Essien-Akpan (2011), the components of IFRS financial statements includes fair representation, accounting policies, going concern, accrual basis of accounting, consistency, materiality, off-setting, comparatives as set out in the diagram above and described below.

Fair Presentation is the appropriate application of IFRS result in Financial Statements that achieve fair presentation resulting from the selection of appropriate accounting policies and their application.

Accounting Policies - are the specific principles, bases, convention, rules and practices adopted by an entity in preparing and presenting financial statements. Policies selected must comply with the interpretation of the International Financial Reporting Interpretation Committee (IFRIC), where there are no specific requirements, policies should ensure relevance and reliability of information. Such financial statements should disclose that they comply with IFRSs. Compliance should not be claimed unless all applicable IFRSs and interpretations have been applied. A company's financial statements should disclose the accounting policies that have been selected and used.

Going Concern - is described as an entity's ability to continue operating in the foreseeable future, usually one year and especially if certain conditions ceases to exist. An entity prepares financial statements on a going concern basis unless management either intend to liquidate the entity or to cease trading or has no realistic alternatives but to do so. Where there are material uncertainties related to events or conditions that may cast significant doubts on the entity's ability to continue as a going concern, the entity shall disclose those uncertainties. Management, when preparing financial statement, make an assessment of an entity's ability to continue as a going concern.

Accrual Basis of Accounting – recognizes transactions and events when they occur and not when cash is received or paid. They are recorded in accounting records and reported in the financial statements of the periods to which they relate. An enterprise should prepare its financial statements under the accrual basis of accounting except for cash flow statements. Cash flow statements looks at the cash transactions within the period.

Consistency - arises when an item's presentation and classification is retained from one period to the next.

Materiality - Information is material if its omission or misstatement could influence the economic decisions of users taken on the basis of the financial statements. Each material class of similarities should be presented separately in financial statements. Each material class of similar items should be presented separately in the financial statements. Materiality depends on the size and nature of the item. Items of dissimilar nature shall be presented separately unless they are immaterial.

Offsetting - Emphasises that assets and liabilities and income and expenditure shall not be offset unless required or permitted by a standard or interpretation.

Comparativeness - should be provided for all numerical information except when a standard offers an exemption.

VI. Roadmap for the Adoption of IFRS and the Implications in Nigeria

The roadmap to the adoption of the IFRSs in Nigeria was its announcement on 2/9/10 by the Federal

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Government of Nigeria disclosing the schedule for the implementation as follows:

- All companies listed on the Nigerian Stock Exchange (NSE) and significant public entities are expected to have complied with IFRS since 1st January, 2012.
- Other public interest entities will commence with effect from 1st January, 2013.
- The commencement year for small and medium sized entities will be with effect from 1st January, 2014.

The implication of the schedule of adoption of the IFRS in Nigeria is the harmonization of the disparity of the existing Nigeria's standards with that of IFRSs together with the necessity to develop new skills. A transition programme from Nigeria Accounting Standards to IFRSs will be required. Systems and controls are to be designed to ensure consistency in the application of standards.

VII. Benefits and Challenges of the Implementation of Ifrss to Economic Development

Results arising from investigation conducted on the European Union member states highlighted how IFRS has benefited European countries in terms of attracting Foreign Direct Investment (FDI). IFRS will position Nigerian companies in the global market place as well as ensure transparency, accountability and integrity in financial reporting in Nigeria which is a pre-requisite for the attraction of investment that will promote economic development. It will provide international investors the ability to make well-informed, useful and meaningful comparison of investment portfolio in Nigeria and other countries. Multinational companies with the aid of IFRS financial statement provide for easy consolidation of financial statements. It promotes better management control systems. IFRS statements are easier to comply with the financial requirements of overseas stock. It also facilitates ease of cross border transactions and trading within the region through common accounting practice especially in underdeveloped regions of the world like the Economic Community of West African States (ECOWAS). It will help to facilitate compilation of meaningful data on the performance of enterprises within the ECOWAS and other regions of the world. It will assist Nigeria, the federal and state government, local governments inclusive, in attracting international investors as the adoption of IFRS financials promotes easy monitoring of overseas investments. Transparency and better accountability in government Ministries, Departments and Agencies (MDA) will be promoted through the IFRS adoption in the public sector accounting and management of resources. It will also lead to increase in government revenue as a result of transparency and integrity in reporting. Easier access to capital is also facilitated through IFRS. Despite the aforementioned envisaged benefits there are still challenges. There is the urgent need to improve the level of public awareness especially among investors and regulatory authorities in Nigeria. There is also chronic shortage of professionals that are competent to implement the IFRS within the given time frame as contained in the schedule of the Nigerian roadmap for its adoption (i.e. January 2012 - January 2014).

VIII. Conclusion and Recommendations

Clifford and Demaki (1999) insists that information (financial report) is the bedrock of effective management function. Without appropriate and reliable IFRS based financial statement, management cannot plan well, hire the right labour, provide effective control and leadership, identify managerial problems, find solutions and take decisions. Knowledge (i.e. IFRSs based financial report) is power. It provides the power to management and entrepreneurship. Overcoming IFRSs challenges will require updating accounting curricula in all training institutions including the universities and polytechnic in Nigeria. It will also be necessary to harmonize regulatory requirements by amending existing laws that may be a drawback to IFRS. For example, the provision in the Company and Allied Matters Act (CAMA) 1990, the Investment and Securities Act (ISA) 2007, Bank and other Financial Institution Act (BOFIA) 1991 must be harmonized. Constantly keeping up with the pronouncements published by the International Accounting Standard Board (IASB) will also be necessary for the sustainable economic development in Nigeria.

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An Evaluation of Forensic Accountants to Planning Management Fraud Risk Detection Procedures

By Okoye, E.I & Gbegi, D.O
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Abstract - The study of the evaluation of Forensic Accountants to planning management fraud risk detection procedures aimed at investigating the relative merits of involving Forensic Accountants during the planning stage of developing an audit plan that will effectively identify Management fraud. Both primary and secondary sources of data were used for the study. Thirty five copies questionnaire were distributed to Accountants, in Kogi State, out of which 31 were filled and returned. Simple percentages mean and standard deviation were used to quantify the height of the variable. Multivariate Analysis of Variance (MANOVA) and Analysis of Variance (ANOVA) were used for the comparison of the study with Asare and Wright (2004) study. The study found out that, Forensic Accountants effectively modify the extent and nature of audit test when the risk of Management fraud is high, Forensic Accountants propose unique procedures that are not proposed by auditors when the risk of Management fraud is high, Forensic Accountants can make to the effectiveness of an audit plan when the risk of Management fraud is high, involving Forensic Accountants in the risk of Management fraud assessment process leads to better results than simply consulting them. The study recommended that Forensic Accountants should be involved in the planning stage of an audit, before and after the auditor has identified Management fraud risk factors. There is need for more training and accreditation of Forensic Accountants in Nigeria.

Keywords : forensic accountants, planning, management fraud, risk detection, investigating.

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AN EVALUATION OF FORENSIC ACCOUNTANTS TO PLANNING MANAGEMENT FRAUD RISK DETECTION PROCEDURES

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I. Introduction

Management fraud is the "deliberate fraud committed by Management that injures investors and creditors through materially misleading Financial Statements" (Elliot and Willingham 1980, Apostolou, et al, 2000). The ability of an auditor to make an accurate assessment of Management Fraud Risk is crucial to the initial assessment of risk in an audit engagement (Hansen and Klamm 2004). If this assessment is incorrect, the planned audit procedures may be inappropriate or insufficient, and this in turn, may reduce the reliability of the Financial Statements and increase the auditor's exposure to litigation and unfavorable outcomes (Palmrose, 1987).

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When designing audit procedures to reduce the risk of not detecting a material misstatement in the Financial Statements of an entity, an auditor is required by professional standards to use professional skepticism, to be alert to evidence, not withstanding prior experience with the client's Management, and to be alert to factors that increase the possibility of Management Fraud (Hansen and Klamm, 2004). However, only seven percent of the audit partners experienced five or more material Management Frauds within their careers (Loebbecke, et al 1989), suggesting that auditor' experience with material Management Fraud is limited. One way that auditors can compensate for their limited exposure to fraud is by consulting with fraud experts (Loebbecke, et al 1989).

Asare and Wright (2004) conducted a study in which 69 experienced auditors were provided with a case (based on an SEC enforcement case) and asked to assess the risk of fraud, review and update a standard audit programme for the revenue cycle, and provide an opinion on the necessity of conferring with a risk management partner to finalize the proposed plan. Some of the auditors were given structured guidance in the form of standard risk checklists while other auditors were asked to make their assessments without such structured guidance. Asare and Wright found that the auditors who were provided with structured guidance underestimated the risk of fraud. In contrast, the auditors who were not provided with structured guidance assessed the fraud risk at higher levels and were more likely to refer the file to fraud experts. Nonetheless, the auditors who were not provided with structured guidance were not able to design a more effective audit programme than the other auditors who were provided more structured guidance.

Asare and Wright (2004), recommended that auditors seek the assistance of Forensic Accountants with the development of their audit plan when there is perceived risk of heightened Management Fraud by an auditor client. However, since consultations with experts are costly, auditors would like to avoid referring issues to Forensic Accountants unless they believed that a substantially elevated risk of fraud was present in an engagement. In such setting, auditors may delude themselves into understating fraud risks in an engagement; or, alternatively, auditors may delude

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themselves into believing that consulting with Forensic Accountants would safeguard them against audit programme design weaknesses, while in fact, Forensic Accountants may have limited competencies in audit programme design (AICPA 2006; Dezoort and Stanley 2006, Bedard and Mock 1992).

This study investigate the relative merits of involving Forensic Accountants during the planning stage in assisting the auditor by developing an audit plan that will effectively identify fraud in an audit content. Research reported herein has the potential to contribute to understanding of the usefulness of involving Forensic Accountants in designing an audit plan when the auditors have identified fraud risk factors during the planning stage of the audit. The research was carried out with particular reference to professional Accountants in Kogi State. The work also covered a period of 5 years from 2006 – 2010.

II. Statement of Research Problem

It has been observed by practitioners over the years that auditors are able to identify Management Fraud Risk factors, but may not be able to translate this knowledge into an audit plan that effectively takes these factors into account and increase the likelihood of detecting the fraud if it exists. Forensic Accountants may be able to compensate for such limitations. The research seeks to investigate how relevant the involvement of Forensic Accountants can help during the planning stage in assisting auditors in developing an audit plan that will effectively identify Management Fraud Risk.

III. Objectives of the Study

The main objective of the study is to evaluate the relevance of Forensic Accountants to planning Management Fraud Risk detection procedures.
The specific objectives of the paper are;

i. Determine how Forensic Accountants effectively modify the extent and nature of audit tests when the risk of Management fraud is high.
ii. Examine how Forensic Accountants propose unique procedures that are not proposed by auditors when the risk of Management fraud is high.

IV. Research Questions

To evaluate the relevance of Forensic Accountants on planning Management fraud risk detection procedure, the following research questions were asked;

i. To what extent do Forensic Accountants effectively modify the extent and nature of audit tests when the risk of Management fraud is high?
ii. To what extent do Forensic Accountants propose unique procedures that are not proposed by auditors when the risk of Management fraud is high?

V. Statement of Hypotheses

$H0_1$: Forensic Accountants cannot effectively modify the extent and nature of audit test when the risk of Management Fraud is high.

$H0_2$: Forensic Accountants cannot adequately propose unique procedures that are not proposed by auditors when the risk of Management Fraud is high.

VI. Conceptual Framework

Joshi (2003), Forensic Accounting is the applications of specialized knowledge and specific skills to stumble up on the evidence of economic transactions. Zysman (2001) put forensic accounting as the integration of accounting, auditing and investigative skills. Simply put, forensic accounting is accounting that is suitable for legal review offering the highest level of assurance and including the now generally accepted connotation of having been arrived at in a scientific fashion (Crumbley 2006). Coenen (2005) stated that forensic accounting involves the application of accounting concepts and techniques of legal problem. It demands reporting, where the accountability or the fraud is established and the report is considered as evidence in the court of law or in the administrative proceedings (Joshi 2003). It provides an accounting analysis that is suitable to the court, which will form the basis of discussion, debated and ultimately dispute resolution (Zysman 2001) these means that forensic accounting is a field of specialization that has to do with provision of information that are meant to be used as evidence especially for legal purposes. The persons practicing in this field (i.e. Forensic Accountants) investigate and document financial fraud and white-collar crimes such as embezzlement and investigate allegations of fraud, estimates losses damages and assets and analyses complex financial transaction. They provide those services for corporation, attorneys, criminal investigators and the Government (Coenen 2005). Their engagements are usually geared towards finding where money went, how it got there, and who was responsible. They are trained to look beyond the numbers and deals with business reality of the situation (Zysman 2001).

Early literature in the area of fraud risk assessment attempted to gain an understanding of the factors associated with the increased likelihood of management fraud, or act as warning signals or ("red flags") that can help an auditor assess the risk of fraud in a given situation (Albrecht and Romney, 1980; Loebbecke, Eining and Willingham, 1989; Pincus, 1989; Heiman-Hottman, Morgan and Patton, 1997). However, much of this research such as Hackenbrack (1993) and

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Eining et al (1993) studied novice rather than expert auditors (Bonner and Levis 1990; Bonner and Pennington 1991). Also they appear to be limited research into judgment processes involved in judgments about the risk of material Management Fraud.

While there have been several process-oriented studies that have addressed other aspects of the audit processes (Biggs and Mock, 1983; Blocher and Copper, 1986), there have been only a few process-oriented studies of Management Fraud Risk assessment. For example, Jamal, Johnson and Baryman (1995) were interested in the way in which farming effects would contribute to the auditor's ability to detect an embedded fraud within the financial statements presented as part of the case materials. Jamal et al (1995) found that over half of their subjects were deceived by Management's frame and thus failed to detect the fraud.

Zimbuman (1997) investigated whether the American Institute of Certified Public Accountants (AICPA) which requires auditors to separately assess the risk of Management Fraud will lead auditor to spend more time reading fraud cues and design audit plans that are more sensitive to fraud risk. Zimbuman provided practicing auditors from two big firms with cases containing cues indicating high fraud risk or low fraud risk and asked them to search information stored on a computer, make inherent risk assessments, prepare a staffing budget, and choose audit procedures to test the client's accounts receivable. Computer software kept track of the time subjects spent reading and this time measure was used to test one of the hypotheses of interest whether subjects would spend more time attending to fraud cues when conducting a separate assessment of Management Fraud Risk as compared with a holistic assessment of inherent risk. Zimbuman (1997) found this to be a case. Also, while subjects increased the numbers of hours budgeted for the higher risk case compared to the lower risk case; they did not produce significantly different audit plans for those cases in terms of the procedures selected.

A follow up study by Glover, Prawitt, Schultz and Zimbuman (2003) compared pre-and post planning lodgments and found that post planning judgments were more sensitive to fraud risk factors than in Zimbuman (1997). In their study, auditors adjusted the extent of planned audit tests in response to fraud risk, but made no changes to the nature of their planned tests. Houston et al (1999) had auditors assess the audit risk and business risk for a case where specific errors or irregularities were present, then recommend audit investment and fees. They found that when the likelihood of an error was high, the fee did not contain a risk premium, where as when the likelihood of an irregularity was high, the fee did not contain such a premium.

This suggests that auditors are sensitive to the need for more investment in auditing when high risk of fraud is present, although Houston et al (1999) did not provide evidence on what specific procedures the auditors would perform to compensate for this risk. Auditors could have the desire to compensate for identified risks but not the ability to do so. Some have suggested that an effective way of addressing such risks is to use Forensic Accountants. Asare and Wright (2004) conducted a study wherein experienced auditors' were provided with a case and asked to assess the risk of Management Fraud, and decide whether to consult Forensic Accountants. Some of the auditors were given structured guidance in the form of standard risk questionnaires, while other auditors were asked to make their assessments without structured guidance.

Asare and Wright (2004) found that the auditors who were provided with structured guidance underestimated the risk of Management Fraud. In contrast, auditors who were not provided with structured guidance assessed the Management Fraud Risk at higher levels and were more likely to refer the file to fraud specialists. However as in Zimbelman (1997) and Glover et al (2003), these auditors were not able to design a more effective audit programme like the other auditors.

Mock and Turner (2005) investigated Management Fraud Risk assessments and effects on audit programmes. They sampled clients over a two year period to identify how the auditor's actions changed when the client risk assessment was other-than-low risk versus low risk based on the number of fraud risk factors present. They found that the auditors in their study identified Management fraud risk factors and modified the nature, extent and/or timing of audit procedures, assigned more experienced audit team members to the audit, or added or deleted procedures. Mock and Turner's results showed that the more management fraud risk factors where present, the more changes made to the extent of planned audit procedures. Zimbelman (1997), Glover et al (2003), Mock and Turner (2005) determined that the decision to modify the audit programme in response to Management Fraud Risk assessment was influenced by AICPA. These findings are at odds with those of Asare and Wright (2004). In addition, Mock and Turner addressed auditing standards, and they did not directly look into the use of Forensic Accountants in audit content.

Wells (2004) pointed out that large accounting firms have Forensic Accountants on staff but they are use reactively rather than proactively. He recommended that Forensic Accountants become involved during the audit to help identify key risk areas. The Forensic Accountants would identify the risk areas and communicate these to the auditors for further consideration. Wells (2004) argued that the presence of

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Forensic Accountants on an audit would act as a deterrent to fraud-inclined client for there would be a perception that the likelihood of illegal activities being detected would increase. Wells (2004) does not support his conjectures with evidence, so it is difficult to know whether Forensic Accountants could contribute in the way he suggests.

The literature review indicates that there is no published research on the usefulness of seeking the assistance of a Forensic Accountants during the planning stage of an audit. The usefulness of consultations with Forensic Accountants is often based on anecdotal evidence after a fraud has been discovered where it is suggested that the auditors should have sought the assistance of a Forensic Accountants. When auditors fail to detect a Management Fraud the public is usually left asking, where were the auditors? In recent years, there has been a focus on the auditor's need to do a better job at assessing the potentials fraud at their audit client. However, once the auditor has assessed and increased potential risk, what is the next course of action? Presumably the auditor needs to review the audit plan from the standard audit plan to one more likely to detect the existence of fraud. Auditors could either tailor the audit programme themselves or seek the assistance of Forensic accountants if they believe that the Forensic Accountants can do a better job, and they are right, then they should forward the file to the Forensic Accountants. However, if the Forensic Accountants is no more skilled at this than they are in adjusting the audit plan to increase the chances of fraud detection, then the auditors should revise the audit plan themselves, although they may need additional training or decision aids to this effectively.

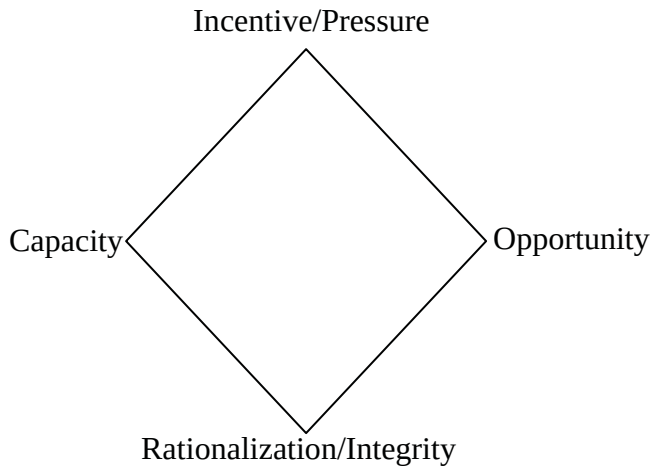
VII. Theoretical Framework

Expert over time have attempted to formulate theories that explain the mind set of fraudster. Unless *Forensic* Accountants understand the w y the fraudster thinks, they will not be able to keep one step ahead of the fraudster. The theories that will guide this study are the theory of fraud Diamond and the white-collar fraudster.

a) *Theory of the Fraud Diamond*

Wolf and Hermanson (2004), cited by Crumbley et al, (2007), proffered the Theory of the Fraud Diamond, in place of the triangle. They argue that the diamond offers a better view of the factors leading to fraud. They add a fourth variables, capacity, to the three-factor theory of Cressey. The fraud perpetrator must have the necessary traits, abilities, or positional authority to pull off his crime.

i. *The Fraud Diamond*



Source : Crumbnley D. L., Heitger L. E., and Smith G.S. (2007), Forensic and Investigative Accounting, 3rd Ed, Chicago, CCH

ii. *The White-Collar Fraudster*

Crumbley et al (2007) set out the characteristics of the white-collar fraudster. They include: Likely to be married; Member of a Church (or Mosque), Educated beyond high school, No arrest record, Age range from teens to older than 60, Socially conforming, Employment tenure from 1 to 20 years, Acts alone 70% of the time.

He further concluded that given the right pressures, opportunities and rationalizations, many employees are capable of committing fraud. Fraud identifiers include large ego, drug abuse or gambling addiction, living beyond apparent means, self-absorption, hardworking with very little or no vacations, under financial pressure, and sudden mood changes (Moulton, Cited by Crumble et al, 2007). Senior level management fraudsters tend to be overly ambitions people, obsessed with enhancing power and control, narcissistic personality, with an over-inflated sense of superiority. They are commonly surrounded by "yes men" and believe they are above the rules.

VIII. Research Methodology

This study employs both primary and secondary sources of data collection and analysis. The same questions in Asare and Wright (2004) questionnaire were adopted for this study as primary source of data, while secondary sources of data were obtained through internet and library. Also an empirical survey was used to obtain the perception of professional accountants in the area of Forensic Accounting practice in Nigeria.

The population of the study comprises 250 professional Accountants in Kogi State. A purposive sampling techniques which is a non-probability sampling techniques was adopted to choose a sample size of 35 professional Accountants. Thirty five copies of questionnaire were administered and thirty one were filled and returned. The data were presented and

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percentages, mean and standard deviation were computed to quantify the weight of variables. Multivariate Analysis of Variance (MANOVA) and Analysis of Variance (ANOVA) were computed for the comparison with the study of Asare and Wright (2004), as this study is based on his previous research. The choice for MANOVA is the fact that, the study has several correlated dependent variables, and the study desires a single overall statistical test on this set of variable instead of performing multiple individual tests, while ANOVA helps to test for the significance of the differences between more than two sample means.

IX. Discussion of Results

As table 4.1, 4.2 and 4.3 (see appendices) indicates, Forensic Accountants estimated inherent risk similarly to Asare and Wright's auditors who completed the same task. However, the participants rated control risk and fraud risk higher than Asare and Wright's participants. Subjects who completed version B (with checklist) of the case rated control risk and fraud risk higher than the risk levels given in version A of the case.

As mentioned earlier, subjects were asked to perform three audit procedure planning tasks. First, they were given a standard audit programme and asked to select procedures from that programme. Subjects' choice summarized in Table 4.4, Table 4.5 (see appendices) indicates that participants' choice of procedures from the standard audit programme does not appear to be associated with whether they were given the audit team's risk assessments or whether they completed their own risk assessments in either individual groups of procedures, or standard audit programme taken as a whole.

The second task involved revisions to the previous year's budgeted hours for the various categories of procedures, as summarized in table 4.6. In contrast with the findings of table 4.5, table 4.6 (see appendices) indicates that the version of the case presented to participants influenced their proposed revisions to hours budgeted for analytical procedures and cut-off tests, but not other groups of tests. In comparison with Asare and Wright's auditors, who made no meaningful adjustments to the time budget, the Forensic Accountants adjusted the audit plan to respond to the fraud risk in the case, but this was only for version B of the case where they analyzed fraud checklist and performed the risk assessment themselves, as opposed to being given the audit team's summary risk assessment and then being consulted to contribute to the audit plan.

In addition, participants overall revision to the budgeted hours for other tests (i.e. tests not mentioned in the standard programme) are significantly associated with whether they possessed a formal specialist designation (IFA-Investigation Forensic Accounting). The Forensic Accountants with a formal specialist designation made more normative adjustments to the audit plan to address the Management fraud risks raised in the case than ought other Forensic Accountants. In other words, they increased the amount of time to be spent on non-standard audit procedures to address Management fraud risks.

The third planning task asked participants to identify any additional procedures they thought necessary, as summarized in table 4.7 (see appendices). Asare and Wright (2004) identified the additional procedures which contained a list of benchmark procedure that had been suggested by two advisers based on an analysis of SEC's 1998 Accounting and Auditing Enforcement Release (AAER). Two independents forensic experts assessed the subjects responses against the list of procedures summarized in this benchmark and the results are reported in table 4.7 (see appendices) alongside Asare and Wright's (2004) results for their auditor subjects. Since the subjects in their study completed two different versions of the case (Types A, where subjects were only given the audit team's summary risk assessment, and Type B, where subjects were required to make their own risk assessments given the case information and a risk checklist). Table 4.7 (see appendices) summarizes the audit procedures under these two headings. In comparison with Asare and Wright's auditors, the Forensic Accountants in this study identified a much smaller number of procedures listed in SEC benchmark programme.

Table 4.8 (see appendices), panels A and B, summarizes additional procedures that the participants proposed. There were 14 such procedures; with an average of 2 procedures per person (median was 2, and standard deviation was 2). Panel A of table 4.8 (see appendices) describes each procedure and fraud-related specific risks that it addresses; panel B of table 4.8 (see appendices) indicates how many procedures listed in panel A were proposed by the participants in their study. The highest number of additional procedures proposed was five (one person), and the lowest-none (seven people). Interestingly, as many as six participants proposed four additional procedures.

The first question was whether Forensic Accountants effectively modifies the extent and nature of the audit test when the risk of Management fraud is high. The study found that Forensic Accountants inherent risk judgments were indistinguishable from those of auditors who participated in Asare and Wright's (2004) study; however, their control risk and Management fraud risk assessments were higher than those of the auditors. The two different version of the case influenced Forensic Accountants proposed revisions to hours budgeted for analytical procedures and cut-off tests, but not other groups of tests. It appears that being involved in the risk assessment

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checklist and assessing inherent, control and Management fraud risk sensitized the Forensic Accountants to the Management fraud risk in the case. This suggest that a consultative role for Forensic Accountants whereby an audit team provides a summary risk assessment to the Forensic Accountants may not result in a satisfactory outcome as a participative role whereby the Forensic Accountants participates in the risk assessment process. Also, overall revisions to the budgeted hours in standard audit programme for the revenue cycle depended on whether they possessed Investigative and Forensic Accountants (IFA) designation. In particular, the amount of time budgeted to other, non-standard procedures, depended on the Forensic Accountants formal designation as a specialist. More so, the testing of hypothesis showed that Forensic Accountants can effectively modify the extent and nature of audit test when the risk of Management fraud is high.

The second question was whether Forensic Accountants propose unique procedures that are not proposed by auditors when the risk of Management fraud is high? Two independents Forensic Accountants reviewed the subjects' responses to the audit procedures and evaluated whether the procedures addressed items in Asare and Wright's (2004). In comparison with Asare and Wright's auditors, the forensic accounting participants identified a much smaller number of procedures listed in the SEC benchmark programme. However, they identified a significant number of additional procedures that were not contained in Asare and Wright's but would effectively address some of the risks in the case. The Forensic Accountants in this study rated all the procedures identified by the Forensic Accounting participants and compiled the list of procedures in table 4.8 that they assessed as being as effective as or more effective than the procedures listed in Asare and Wright's (2004). Thus, if assessed solely against the benchmark contained in Asare and Wright's, it would appear that Forensic Accountants do not perform the type of audit planning task involved in this study as effectively as auditors. However, it assessed against the benchmark contained in table 4.8, the Forensic Accountants perform the task very well. Asare and Wright (2004) concluded that their auditors' willingness to consult with Forensic Accountants is a boon because the Forensic Accountants would compensate for the auditors inability to develop more effective audit tests and by suggesting such tests to them when consulted. This study confirms the assumption. However, if only Asare and Wright's procedures were used to judge Forensic Accountants procedures the conclusion would be quite different. Also, the hypothesis shows that Forensic Accountants can adequately propose unique procedures that are not proposed by auditors when the risk of Management Fraud is high.

More so, previous studies indicate that auditors are able to identify Management fraud risk factors, but may not be able to translate this knowledge into an audit plan that effectively takes them into account and enhance their chances of detecting the Management fraud if it exists. Forensic Accountants may be able to compensate for such limitations, but the study shows that in comparison with Asare and Wright's auditors who did not make meaningful adjustments to the audit plan, the Forensic Accountants adjusted the audit plan to respond to the Management fraud risks in the case, but this was only the case when they performed the risk assessment, as opposed to being given the audit team's risk assessment and then being consulted to contribute to the audit plan. Also, in comparison with the additional procedures that Asare and Wright's auditors identified to address the risks in the case, the fraud specialists in this study identified many more such procedures. This finding supports the important contribution that Forensic Accountants can make to the effectiveness of an audit plan when the risk of Management fraud is high.

In particular, the study findings suggests that involving the Forensic Accountants in the risk assessment process leads to better results than simply consulting with them by providing summary risk assessments and asking for input. The results of this study may also provide guidance on the training of Forensic Accountants. Current Forensic Accountant training tends to be focused on the investigation of Forensic Accountants once a fraud has been detected within their organization. Should auditors become more likely to consult with Forensic Accountants then the education of such Forensic Accountants may need to be revised to increase the usefulness and effectiveness of their counsel.

A limitation of the study is that Forensic Accountants in this study were Nigerian whereas the auditors in Asare and Wright's (2004) study were U.S. auditors. In an extension of this study, it is interesting to note that when comparing the Forensic Accountants with a formal specialist designation with those without such a designation, it was found that those with designated specialists made more normative adjustments to the audit plan to address the Management fraud risks raised in the case.

X. Summary of Findings

The summary of findings for the research is as follows;

(i). That Forensic Accountants inherent risk judgments were indistinguishable from those of auditors who participated in Asare and Wright's (2004), however their control risk and Management Fraud risk assessment were higher than those of the auditors.

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(ii). That a consultative role of Forensic Accountants may not result in a satisfactory outcome as a participative role whereby the Forensic Accountants participates in the risk assessment process.

(iii). That Forensic Accountants can effectively modify the extent and nature of audit tests when the risk of Management Fraud is high.

(iv). That Forensic Accountants can adequately propose unique procedures that are not proposed by auditors when the risk of Management Fraud is high.

(v). That auditors are able to identify Management Fraud Risk factors, but may not be able to translate this knowledge into audit plan that effectively takes them into account and enhance their chances of detecting the Management Fraud if it exist. Forensic Accountants may be able to compensate for such limitations.

(vi). Forensic Accountants can make to the effectiveness of an audit plan when the risk of Management Fraud is high.

XI. Conclusion

In conclusion, this study has analyzed why attention has to be given to issue of planning Management Fraud Risk detection procedures with the aid of Forensic Accountants. The study appreciates the potentials to contribute to further understanding of the usefulness of seeking the assistance of a Forensic Accountant and help in determining the best strategy for auditors to use when they encounter risk factors that signal a higher than normal risk of Management Fraud.

Involving Forensic Accountants in the risk assessment process leads to better results than simply consulting with them by providing summary risk assessments and asking for input.

XII. Recommendations

(i). The Institute of Chartered Accountant of Nigeria, Certified National Accountants and other Accounting professional bodies should encourage formalization and specialization in the field of Forensic Accounting.

(ii). The government and the private sector organizations should develop interest in Forensic Accounting and accountants for monitoring and investigation of any suspected and confirmed Management Fraud Risk.

(iii). That the practicing accountants should be work towards specialization and possibly establish firm for Forensic Accounting practices only.

(iv). That academia should emphasis skills development in the field of Forensic Accounting.

(v). Since Nigeria have the enabling environment to practice Forensic Accounting, the Companies and Allied Matters Act 2004 as amended, should be review to make it mandatory for every public companies to be audited annually using Forensic Accounting system, by doing so, some major Management Fraud Risk that the conventional audit system will not be able to detect can be uncovered using Forensic Accountants.

(vi). That Forensic Accountants should be involved in the planning stages of an audit, before and after the auditors has identified Management Fraud Risk factors.

(vii). There is need for more training and accreditation of Forensic Accountants in Nigeria.

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Appendices

Table 4.1 : Descriptive Statistics

Variable	n	Min	Max	Mean	Std. Dev.
Panel A					
Number of fraud risk factors checked off on the checklist	16	4	16	9.19	3.692
Inherent Risk Assessment (IR)**	16	2	9	6.00	2.191
Control Risk Assessment (CR)	16	2	8	4.81	2.040
Fraud Risk Assessment (FR)	16	4	10	6.75	1.571
Panel B					
Number of standard procedures selected to test aged trial balance (out of 3) (stdtestATBscore)	25	1	3	2.52	0.653
Number of standard procedures selected to test confirmations (out of 6) (stdCOMFIRMscore)	25	1	6	5.24	1.234
Number of standard procedures selected to test for adequate of bad debt provision (out of 4) (stdBADDEBTscore)	25	0	4	3.04	1.060
Number of standard procedures selected to test cut off (out of 2) (stdCUTOFFscore)	25	1	2	1.80	0.408
Number of standard procedures selected as analytical procedures (out of 8) (stdANALYTICALscore)	25	0	6	4.76	1.562
Percentage of standard procedures selected from the entire standard program (stdPROGRpercent)	25	21.74	91.30	75.47	17.70
Panel A and B					
Proposed revisions to the time budget for the final audit program for tests of aged trial balance, in % relative to original budget (testATBrev)	26	-10	10	1.23	3.819
Proposed revisions to the time budget for the final audit programme for confirmations, in % relative to original budget (CONFIRMrev)	29	-15	15	4.93	5.669
Proposed revisions to the time budget for the final audit programme for tests of adequacy of bad debt provision, in % relative to original budget (BADDEBTrev)	27	0	15	5.59	4.601
Proposed revisions to the time budget for the final audit program for cutoff tests, in % relative to original budget (CUTOFFrev)	26	0	20	7.85	5.856
Proposed revisions to the time budget for the final audit program for analytical procedures, in % relative to original budget (ANALYTICrev)	26	0	20	5.08	5.599
Proposed revisions to the time budget for the final audit program for other tests, in % relative to original budget (OTHERTESTrev)	27	-10	50	7.96	11.203
Proposed revisions to the time budget for the final audit program for all tests, in % relative to original budget (TOTALREVHRSrev)	26	5	70	21.62	15.200

Source : Field Survey (2011)

Notes:

* Only half of the participants (16 out of 31) were provided with fraud factor checklist, the other half received recommended assessments of inherent, control, and fraud risk.
* Assessments were performed on a 10 point scale where 1 = extremely low risk, and 10 = extremely high risk.

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Table 4.2 : Presence of Fraud Risk Factors in the case as Rated by Participants in "No Risk Assessment Provided (Fraud Checklist provided)" Condition (Version Type B)

Fraud Risk Factors Based on Asare and Wright (2004) Checklist	YES (n,%)	No (n, %)
Management's Characteristics and Influence over the control Environment		
Is a significant portion of management's compensation represented by bonuses, stock options, or other incentives, the value of which is contingent upon the entity achieving unduly aggressive targets for operating results, financial position, or cash flow?	15(93.8%)	1(6.3%)
Is there an excessive interest by management in maintaining or increasing the entity's stock price or earning trend through the use if unusually aggressive accounting practices?	10(62.5%)	6(37.5%)
Is there a practice by management of committing to analysts, creditors, and other third parties to achieve what appear to be unduly aggressive or clearly unrealistic forecasts?	10(62.5%)	6(37.5%)
Does management show an interest in pursuing inappropriate means to minimize reported earnings for tax-motivated reasons?	0(0%)	16(100%)
Does management have an ineffective means of communicating and supporting the entity's values or ethics, or communication of inappropriate values or ethics?	3(21.4%)	11(78.6%)
Is management dominated by a single person or small group without compensating controls such as effective oversight by the board of directors or audit committee?	9(56.3%)	7(43.8%)
Does management fail to correct known reportable conditions on a timely basis?	1(6.3%)	15(93.8%)
Does management see unduly aggressive financial targets and expectations for operating personnel?	9(56.3%)	7(43.8%)
Does management display a significant disregard for regulatory authorities?	0(100%)	16(100%)
Does management continue to employ an ineffective accounting, information technology, or internal auditing staff?	0(56.3%)	16(100%)
Has there been a high turnover of senior management, counsel, or board members?	0(100%)	16(100%)
Are there frequent disputes with the current or predecessor auditor on accounting, auditing, or reporting matters?	0(100%)	16(100%)
Is there any known history of securities law violations or claims against the entity or its senior management alleging fraud or violations of securities laws?	0(100%)	16(100%)
Risk factors relating to industry conditions:		
Is there a high declining of competition or market saturation accompanied by declining margins?	15(93.8%)	1(6.3%)
Is the industry declining with increasing business failures and significant declines in customers' demands?	12(75%)	4(25%)
Risk factors relating to operating characteristics and financial stability:		
Is the client unable to generate cash flow from operations while reporting earnings and earnings growth?	3(18.8%)	13(81.3%)
Are there significant pressures to obtain additional capital necessary to stay competitive considering the financial position of the entity-including need for funds to finance major research and development or capital expenditures?	9(56.3%)	7(43.8%)
Are assets, liabilities, revenues, or expenses based on significant estimates that involve unusually subjective judgment or uncertainties, or that are subject to potential significant change in the near term in a manner that may have a financially disruptive effect on the entity-such as ultimate collectability of receivables, timing of revenue recognition, realizability of financial instruments based on the highly subjective valuation of collateral or difficulty-to-assess repayment sources, or significant deferral of costs?	11(68.8%)	5(31.3%)
Are there significant, unusual, or highly complex transactions, especially those close to year-end, that pose difficult "substance over from" questions?	15(93.8%)	1(6.3%)
Are there difficulties in determining the organization or individual(s) that control(s) the entity?	0(100%)	16(100%)
Has the company experienced an unusually rapid growth or profitability especially compared with that of other companies in the same industry?	5(31.3%)	11(68.8%)
Is the company vulnerable to changes in interest rates?	8(50%)	8(50%)
Does the company have an unrealistically aggressive sales or profitability incentive program?	11(68.8%)	5(31.3%)
Is there a threat of imminent bankruptcy or foreclosure, or hostile takeover?	0(100%)	16(100%)
Is there a poor or deteriorating financial position when management has personally guaranteed significant debts of the entity?	1(6.3%)	15(93.8%)

Source : Field Survey (2011)

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Table 4.3 : Comparisons of Risk Assessment provided by participants in Version B- "No Risk Assessment Provided (Fraud Checklist Provided)" Condition against Asare and Wright (2004) (Panel A) and against Values Given to Participants in Version A- "Risk Assessment Provided (No Fraud Checklist provided)" Condition (Panel B)

Panel A : Comparisons of Risk Assessment Provided by Participants in "No Risk Assessment Provided" Condition against Asare and Wright's (2004) Participants in Similar Condition (with Fraud Checklist)

Type of Risk and Test Value	t	df	p-value	Mean Difference	95% Confidence Interval	
					Lower	Upper
Inherent Risk (IR): 5.47	0.968	15	0.349	0.530	-0.64	1.70
Control Risk (CR): 3.64	2.299	15	0.036	1.173	0.09	2.26
Fraud Risk (FR): 4.67	5.297	15	0.000	2.080	1.24	2.93

Source : Field Survey (2011)

Panel B : Comparisons of Risk Assessments Provided by Participants in "No Risk Assessment Provided" Condition against Values Given to Participants in "Risk Assessment Provided" Condition.

Type of Risk and Test Value	t	df	p-value	Mean Difference	95% Confidence Interval	
					Lower	Upper
Inherent Risk (IR): 5.9	0.183	15	0.858	0.100	-1.07	1.27
Control Risk (CR): 3.7	2.181	15	0.046	1.113	0.03	2.20
Fraud Risk (FR): 5.1	4.202	15	0.001	1.650	0.81	2.49

Source : Field Survey (2011)

Table 4.4 : Participants Agreement with Standard Audit Programme for Revenue Cycle from Asare and Wright (2004)

Standard Audit Programme for Revenue Cycle from Asare and Wright (2004)	YES (n,%)	No (n,%)
Aged Trial Balance: Obtain an aged trial balance of trade receivables as of the date selected for confirmation procedures. Perform the following:		
a. Cross-foot the totals and re-foot the total column and analysis columns.	18(72%)	7(28%)
b. Trace total to the general control account and to the lead schedule or working trial balance	24(96%)	1(4%)
c. On a test basis, trace entries for individual customers on the aging analysis (totals and aging detail) to the individual account in the account receivable subsidiary ledger and selected individual accounts from the subsidiary ledge and trace totals and aging detail to the aged trial balance to determine if aging is correct. Test footings of individual customer accounts in the subsidiary ledger.	21(84%)	4(16%)
Confirmations: Select individual customer accounts for confirmation procedures from the aged trial balance and arrange for the preparation of confirmation requests to be mailed under the auditor's control and tested as follows:		
a. Trace individual confirmation requests as to balances and addresses to the subsidiary accounts receivable records.	19(76%)	6(24%)
b. Send confirmations (using envelopes with the auditor's return address) and prepare confirmation statistics	25(100%)	0(0%)
c. Trace confirmation replies to the trial balance and investigate replies with differences.	24(96%)	1(4%)
d. Obtain new addresses for all confirmations returned by the post office and re-mail.	20(80%)	5(20%)
e. Send second requests for all unanswered positive confirmation requests. Consider sending third requests by registered or certified mail and performing alternative auditing procedures.	22(88%)	3(12%)
f. Ascertain whether any accounts or notes have been assigned, pledged, or discounted by reference to minutes, review of agreements, confirmation with banks, etc	21(84%)	4(16%)

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Adequacy of Bad Debt Allowance: Obtain or prepare an analysis of the allowance for doubtful accounts for the period and review adequacy of the allowance and related provision by;		
a. Review the aged trial balance as of the balance sheet date with the client's credit manager or other responsible individual to identify accounts of a doubtful nature and allowances required; review correspondence files and other relevant data in support of client's representations. Items reviewed should include past-amounts and significant amounts whether past due.	22(88%)	3(12%)
b. Examine credit reports for delinquent and large accounts	22(88%)	3(12%)
c. Review confirmation exceptions for indication of amounts in dispute.	22(88%)	3(12%)
d. Consider requesting audited financial statements for large accounts that are past due and appear doubtful.	11(42%|)	14(58%)
Cut-off Tests Perform cut-off tests for sales and returns:		
a. Select sales invoice for testing from the sales register for several days before and after year-end and examine shipping records and determine that they were recorded in the proper period.	22(88%)	3(12%)
b. Select credit memos issued after year-end and examine underlying documentation (for example, record of receipt of returned goods) to determine period to which credit memo is applicable and whether it was recorded in the proper period.	23|(92%)	2(8%)
Analytical Procedures: Analyze and review trends for the following relationships:		
a. Accounts receivable to credit sales	23(92%)	2(8%)
b. Allowance for doubtful accounts to account receivable (in total and in relation to past-due categories per aging analysis).	23(92%)	2(8%)
c. Sales to return all allowance	23(92%)	2(8%)
d. Expense provisions for doubtful accounts to net credit sales	19(76%)	6(24%)
e. Expenses provisions for doubtful accounts to write-offs	16(64%)	9(36%)
f. Moving average relationship of write-offs to trade receivable	15(60%)	10(40%)
g. Average balance per customer	14(56%)	11(44%)
h. Ratio of account receivable to current asset.	14(56%)	11(44%)

Source : Field Survey (2011)

Table 4.5 : Relation of Participants' Agreement with Standard Audit Program to Provided Risk Assessments (Availability of Fraud Checklist) and IFA Designation

Panel A : MANOVA Between-Subjects Effects Using Group-of Tests' Scores in the Standard Programme as Dependent Variables.

Source	Dependent Variable	Type III Sum of Squares	df	F	p-value
Checklist	stdtestATBscore	0.21	1	0.052	0.821
	stdBADDEBTscore	0.301	1	0.303	0.588
	stdANALYTICSscore	0.007	1	0.003	0.955
	stdCUTOFFscore	0.091	1	0.594	0.449
IFA	stdtestATBscore	1.369	1	3.341	0.082
	stdBADDEBTscore	3.080	1	3.101	0.093
	stdANALYTICSscore	6.786	1	3.247	0.086
	stdCUTOFFscore	0.007	1	0.944	0.835
Checklist IFA	stdtestATBscore	0.386	1	0.943	0.343
	stdBADDEBTscore	1.732	1	1.744	0.201
	stdANALYTICSscore	7.670	1	3.671	0.069
	stdCUTOFFscore	0.479	1	3.070	0.094
Error	stdtestATB score	8.603	21		
	stdBADDEBTscore	20.857	21		
	stdANALYTICSscore	43.881	21		
	stdCUTOFFscore	3.214	21		

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Panel B : ANOVA Between-Subjects Effects Using Total Standard Program Score in the Standard Programme as Dependent Variable.

Source	Type III Sum of Squares	df	F	p-value
Corrected Model	92.490	3	2.121	0.128
Intercept	593.285	1	408.023	0.000
IFA	40.702	1	2.800	0.109
Checklist	2.414	1	0.166	0.688
IFA* Checklist	37.951	1	2.611	0.121
Error	305.270	21		
Total	7932.000	25		
Corrected Total	397.760	24		

Source : Field Survey (2011)

Table 4.6 : Relation of Participants' Proposed Revisions to Standard Audit Program to Provided Risk Assessment (Availability of Fraud Checklist) and IFA Designation

Panel A : MANOVA Between-Subjects Effects Using Proposed Revisions to Budget Hours for Groups-of-Tests in the Standard Audit Programme as Dependent Variables.

Source	Dependent Variable	Type III Sum of Squares	df	F	p-value
Checklist	testATBrev	29.630	1	1.914	0.182
	CONFIRMrev	82.212	1	2.526	0.128
	BADDEBTrev	2.107	1	0.081	0.779
	CUTOFFrev	170.801	1	5.246	0.033
	ANALYTICSrev	135.204	1	4.195	0.054
	OTHERTESTrev	46.907	1	0.966	0.337
IFA	testATBrev	8.940	1	0.577	0.456
	CONFIRMrev	59.091	1	1.816	0.193
	BADDEBTrev	1.004	1	0.38	0.846
	CUTOFFrev	4.674	1	0.144	0.709
	ANALYTICSrev	12.618	1	0.391	0.539
	OTHERTESTrev	210.700	1	4.340	0.050
Checklist* IFA	testATBrev	8.940	1	0.577	0.456
	CONFIRMrev	60.833	1	1.869	0.187
	BADDEBTrev	2.107	1	0.081	0779
	CUTOFFrev	43.674	1	1.341	0.260
	ANALYTICSrev	5.894	1	0.183	0.673
	OTHERTESTrev	19.312	1	0.398	0.535
Error	testATBrev	309.659	20		
	CONFIRMrev	650.845	20		
	BADDEBTrev	521.709	20		
	CUTOFFrev	651.132	20		
	ANALYTICSrev	644.659	20		
	OTHERTESTrev	970.909	20		

Panel B : Anova Between-Subjects Effects Using Proposed Revision To Total Budgeted Hours In Standard Audit Programme Of Revenue Cycle As Dependent Variable.

Source	Type III Sum of Squares	df	F	p-value
Corrected Model	1502.934	3	2.579	0.079
Intercept	12558.258	1	64.654	0.000
IFA	1468.515	1	7.560	0.012
Checklist	29.885	1	0.154	0.699
IFA* Checklist	52.562	1	0.271	0.608
Error	4273.220	22		
Total	17924.000	26		
Corrected Total	5776.154	25		

Source : Field Survey (2011)

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Table 4.7 : Participant-proposed Additional Procedures Relative to the SEC Benchmark Used in Asare and Wright (2004)

Asare and Wright (2004) Participants			Expert 1 Assessment of Fraud Specialists' Responses				Expert 2 Assessment of Fraud Specialists' Responses			
Benchmark Program Audit Test Number	Standard Program (n=31)	% of 31	Type A* (n=16) n	% of 16	Type B** (n=15) n	% of 15	Type A* (n=16) n	% of 16	Type B* (n=15) N	% of 15
1	10	32%	-	-	-	-	-	-	-	-
2	13	43%	6	38%	4	27%	2	13%	2	13%
3	-	-	-	-	1	7%	-	-	1	7%
4	-	-	-	-	-	-	-	-	-	-
5	1	3%	-	-	-	-	-	-	-	-
6	15	48%	3	19%	7	47%	-	-	-	-
7	9	29%	-	-	-	-	-	-	-	-
8	4	13%	-	-	-	-	1	6%	-	-
9	9	29%	3	19%	3	20%	6	38%	5	33%
10	2	6%	-	-	-	-	-	-	-	-
11	1	3%	-	-	1	7%	-	-	-	-
12	4	13%	-	-	-	-	-	-	1	7%
13	-	-	-	-	-	-	-	-	-	-
Total	68		12		16		9		9	

Source : Field Survey (2011)

Notes: Benchmark programme Procedures from Asare and Wright (2004)

1. If available, read minutes of the November 13th Meeting with distributors
2. Inquire of distributors who committed on November 13th as to their understanding of the terms of sales,
3. Inquire of distributors who were at the November 13th meeting and who did not commit to participate in the marking programme as to their reasons for not committing.
4. Inquire of undecided distributors who changed their minds between November 13th and year end, the reasons for changing their mind.
5. If minutes of November 13th meeting not available, inquire of sample of distributors at the meeting to ascertain their understanding of the issues discussed.
6. Review correspondence file with distributors for evidence of side agreements.
7. Investigate the rationale for precision's involvement in the storage and warehousing of distributors sales.
8. Ascertain ability of distributors to store huge orders and the responsibility for paying storage costs.
9. For all increase in credit limits, review client analysis of distributor credit-worthiness. If no analysis exists, perform probing, substantive analysis of distributors; creditworthiness.
10. Test with end-users to confirm that precision as encouraging them to buy from the distributors.
11. Compare sales in the first quarter of 2000 to that indicated by precision's operating plan.
12. Look at subsequent cash receipts for some of the large distributor's sales.
13. Compare orders taken via the marketing programme to authorize credit limit.

* Type A is version of the experimental case where subjects only given the audit team's summary risk assessments;
* Type B is version of the experimental case where subjects were required to make their own risk assessments given the case information and a risk checklist.

Table 4.8 : Participant-Proposed Additional Procedures beyond those Listed in Asare and Wright (2004)

Panel A : Description of Additional Procedures Proposed by Forensic Accountants.

No.	Description of Risk	Procedure
1	Revenue Recognition: Revenue are recognized by precision before they are ended (Fraud specialist referred to this risk by such labels as "Channel Stuffing", "Bill and Hold")	Sales to distributors and not sold on to the end user should be measured against the revenue recognition criteria. Abnormal finance terms are indicators of non-compliance with GAAP. Perform the following on sample of distributors: Obtain the contract;

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		Ascertain whether the 4 revenue recognition criteria are met; and Determine whether precision assisted the customer in obtaining financing or provided direct financing for the sale.
2	Precision is shipping goods in excess of what distributors have committed to and/or have the capacity to sell.	Select key item sample of distributors for confirmation of inventory on hand and amount receivable by Precision. Contact any non-replies by phone directly to enquire of status of account (in the circumstances shipment records or subsequent payments may be inappropriate and of questionable value). Make enquiry of 4 distributors regarding their allotment minima. Request and review schedule of allotments of product that must have been prepared by the company and probably revised several times.
	Channel Stuffing	Review the terms under which precision ships goods to customers to ensure they are based on a purchase contract and that no channel stuffing has occurred.
3	Analog sales/ purchases	Analyze monthly analog sales and order trends of for company and industry. Assess impact of programme on historical purchases by each of the known customers. If end users would be increasing analog purchases to an implausible level, assessment of the consequences of the distributors were still having significant quantities on hand. Ultimately, if end uses cannot absorb the equipment what happens? (e.g., bed debts, damage to distribution chain or does precision step into rescue the distributors and or provide additional incentives for the end users).
4	Consignment	Ensure no consignment type arrangement exist especially for customers who don't have warehouse capacity.
5	Customers verification	Obtain listing of customers who have been distributed funds by precision. Investigate any distributors and sales that are comfortable in timing or amount. Obtain supporting documentation to understand the nature of the distribution as well as whether all revenue recognition criteria have been met.
6	Precision recognizes revenue upon shipment. If they ship to warehouse, but customer does not have the need/capacity for such goods, the company may be improperly recognizing revenue, when all required criteria for recognition have not been met.	Assess ownership of good in offsite storage Has legal title passed Who owns offsite storage Who is responsible for rent Who pays insurance (many)
7	Confirmation with distributors	Confirm with distributors all amounts; Removed from precision's inventories but not delivered to distributors; and held at warehouse or under accommodations to ensure they meet the requirements for revenue recognition according to GAAP. Tie these amounts into sales contracts.
8	Allowance for doubtful accounts Provision for bad debts is not adequate	Obtain download of customers list. Run customer list against credit rating agency database. Focus particularly on sales near period end. Examine supporting documentation to ascertain whether amounts were collectible at point of revenue recognition.
9	Account receivables and doubtful account	Assess the reasonableness of accounts receivable collection and allowance for doubtful accounts. (Although credit has been extended, it is uncertain on what basis credit history would support collectability since credit history reflects past, but customers already acknowledge difficulty in paying for new management initiative. Uncertain if they can sell analogue if precision is already experiencing difficulty selling).
10	Analog sales on precision estimate	Obtain analog sales data for distributors participating in the marketing programme. Compare distributors' sales to third parties to distributor's analog purchase from precision. Determine if distributors are on track for selling 30% (based on precision estimate) of their inventory when their promissory notes are due to precision.
11	Right to return Distributors will ship back product prior to or on June 2006	Review the terms under which precision will accept return of their goods.
12	Historical rates of returns	Analysis and assess the historic rates of returns for participation in

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		marketing programmes and actual returns during field work period to determine if provision needed and if so the adequacy of management's provision.
13	Understated Expenses Precision has not recorded all the expenses associated with the programme. As this is a new programme management judgment will be used to determine expenses.	Review the documentation prepared by precision to estimate the effects of the new marketing programme. Identify costs factored into the analysis of the programme and what costs have been omitted (if any). Examine and recalculate company's estimate of costs and revenue contra amounts and those actually accrued (if any).
14	Motivation for programme The establishment of the marketing programme was motivated by management compensation plan rather than sound business rational and therefore reflects a conflict of interest.	Determine the impact of the marketing programme in management compensation by comparing the year's bonus to top management (by employee) to prior year's to see how much individuals are benefiting from marketing programme.

Source : Field Survey (2011)

Panel B : Frequency of Additional Procedures Proposed by Forensic Accountants

Number of Additional Procedures Proposed	Number of participants	%	Cumulative %
0	7	22.6	22.6
1	8	25.8	48.4
2	7	22.6	71.0
3	2	6.5	77.4
4	6	19.4	96.8
5	1	3.2	100.0
Total	31	100.0	

Source : Field Survey (2011)

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Effective Value Added Tax: An Imperative for Wealth Creation in Nigeria

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Abstract - This study aimed at evaluating the influence of revenue generated through Value Added Tax (VAT) on wealth creation in Nigeria. In an effort to accomplish this objective, secondary data were generated from Federal Inland Revenue Service and Federal Bureau for Statistics which were analyzed with the aid of table and simple percentages while the hypotheses formulated were tested using Product Moment Correlation Coefficient and Student T-test. The findings revealed that revenue generated through VAT has a significant influence on wealth creation in Nigeria and also that revenue generated through VAT has a significant effect on total tax revenue in Nigeria. However, it has been recommended among others that Federal Inland Revenue Service should pay attention to the informal sector of the economy by creating VAT offices at the Local communities so as to generate more revenue and to fully achieve the objectives of wealth creation through VAT. Equally there should be constant review of existing laws every four months as done in the United State of America and other advanced economies to create room for flexibility in line with the changing economic circumstances.

Keywords : value added tax, revenue, wealth creation, nigeria.

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EFFECTIVE VALUE ADDED TAX AN IMPERATIVE FOR WEALTH CREATION IN NIGERIA

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Effective Value Added Tax: An Imperative for Wealth Creation in Nigeria

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Abstract - This study aimed at evaluating the influence of revenue generated through Value Added Tax (VAT) on wealth creation in Nigeria. In an effort to accomplish this objective, secondary data were generated from Federal Inland Revenue Service and Federal Bureau for Statistics which were analyzed with the aid of table and simple percentages while the hypotheses formulated were tested using Product Moment Correlation Coefficient and Student T-test. The findings revealed that revenue generated through VAT has a significant influence on wealth creation in Nigeria and also that revenue generated through VAT has a significant effect on total tax revenue in Nigeria. However, it has been recommended among others that Federal Inland Revenue Service should pay attention to the informal sector of the economy by creating VAT offices at the Local communities so as to generate more revenue and to fully achieve the objectives of wealth creation through VAT. Equally there should be constant review of existing laws every four months as done in the United State of America and other advanced economies to create room for flexibility in line with the changing economic circumstances.

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I. Introduction

Taxation has a rich and colourful background and it is almost as old as man. Its earliest record is its biblical foundation where Zacchaeus a chief tax collector entertained Jesus and later became his disciple. This is an indication that tax was in existence then, otherwise, there would not have been a tax collector. "Now behold, there was a man named Zacchaeus who was a chief tax collector and he was rich (Luke 19:2-8).

Taxation also traced its root to Islam as it is prescribed upon every Muslim top pay Zakat which is the third most important pillar of Islam. Payment of Zakat is made obligatory in at least 22 vases of the Quran, the holy book of Muslim. "Know that whatever of a thing you acquire a fifth of it is for Allah, the messenger, the near relative and the orphans, the needy and he wayfarer… (Quran 8:41).

There are quite a number of definitions of tax or taxation depending on the qualities it posses. In that vein, taxation is the process or machinery by which communities or group of persons are made to contribute… in some agreed quantum and method for the purpose of the administration and development of the society (Igbonyi, 2008).

Taxation is the system of imposing levy by the government against the income, profit or wealth of the individual, partnership and corporate organization (Tabansi, 2001).

In the present dispensation of Nigerian economy, taxation has always been a means by which communities are provided with common facilities such as access roads, religious facilities, security, amongst others from time immemorial (Obadimi, 1994).

Modern and well regulated taxation system in Nigeria started in 1940 with the introduction of direct taxation ordinance No. 29 (CAP 54) of the year. Before the 1940 ordinance, income tax has first been introduced in northern Nigeria in 1904 by Lord Lugard. It was known as community tax, several changes were made to the community tax. Valued Added Tax (VAT) is a tax change on consumption of goods and locally or imported into the country. From the buyer's perspective, it is a tax on the purchase price, while the seller views it is a tax only on the value added to a product, material or services (Tabansi, 2001).

Maurice Laure, joint director of the French Tax Authority was the first to introduced VAT on April 10, 1954, although a German Industrialist Wilhelm Van Siemens proposed the concept in 1918. It was initially directed at large business, but later extended over time to include all business sectors. In France, it is the most important source of state finance accounting for nearly 50& of state revenue (Thacker, 2009).

France favourable experience in the administration of the tax persuaded the original five-member states of the European Economic Community (EEC) to adopt the VAT. The adoption of the tax by EEC countries was made obligatory under the treaty of Rome signed in 1957 (Summerfield, 1980). VBAT became operational in Nigeria on the 1st of January 1994. Though Nigeria joined the league of countries operating VAT just of recent, she has very unique features in the operation of the policy. It is changed at a flat rate of 5% on some items of goods and services. VAT was introduced in Nigeria following a study group set up by the federal government in 1991 to review the nation's tax system. It was this group that proposed VAT and in that same manner, a committee was set up to conduct

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feasibility study on the implementation of the VAT (Thacker, 2009).

VAT was introduced to replace the sales tax because it creates storage incentives to collect than a sale tad does. It differs from sales tax in that, with the latter, the tax is collected and remitted to the government only once at the point of purchase by the end consumer. With VAT, government and credits for taxes already paid occur each time a business in the supply chain purchase products (Tabansi, 2001).

Most economy relies on income from taxation for it development. Aside from its uses as a means of raising government revenue, taxation is also often used as an instrument of regulating the economy, redistributing wealth and inducing preferred modes of behaviour, particularly consumption patterns and investment choices (Naiyebu, 1996, Oyebode, 2010). It is based on the importance of taxation in revenue generation that this research on ''Effective

Value Added Tax: An Imperative for Wealth Creation in Nigeria'' is carried out.

II. Statement of Problem

The attitude of Nigerians towards taxation is worrisome as many prefer not to pay tax if given the opportunity. The economy continues to lose huge amount of revenue through the unwholesome practice of tax avoidance and tax evasion, these loss of revenue can change the fortune of many economy particularly, developing countries like Nigeria. This problem has been lingering for so long which urgent attention and solution is overdue. The cost of collecting tax in Nigeria (both social and economic cost) is too high to the extent that, if left unchecked, the cost may soon outweigh the benefit or value derived from such operation and that will not be appropriate for the system. The government spends more to realize a miserable pittance.

The rate of corruption on the part of tax officials is alarming as most of them connive and collude with supposed-tax- payer to evade and avoid tax. Sometimes, the tax officials are not properly trained on the modern ways of tax administration. The inadequate social infrastructures in Nigeria call for attention as to how tax revenue generated is to be expanded and accounted for, especially where those in authority continue to spend these hand-earned resources with reckless abandon.

This study therefore attempts to address the issues of ineffectiveness of Value Added Tax (VAT) administration in Nigeria with the view for remedying the country's revenue potentials for enhanced wealth creation and development.

III. Objectives of the Study

The study aimed mainly at evaluating the influence of VAT on wealth creation in Nigeria. The specific objectives of the study include:

i. To examine the influence of revenue generated through VAT on wealth creation.
ii. To examine the effect of revenue generated through VAT on the overall tax revenue of Nigeria.

IV. Research Questions

In line with the objectives of the study, the following questions were raised:

i. To what extent does revenue generated through VAT influence wealth creation in Nigeria?
ii. What is the effect of revenue generated through VAT on the overall tax revenue in Nigeria?

V. Statement of Hypotheses

H_0: Revenue generated through VAT has no significant influence on wealth creation in Nigeria.

H_{02}: Revenue generated through VAT has no significant effect on the overall tax revenue in Nigeria.

VI. Significance and Scope of the Study

The study will assist the government in policy formulation as it relates to Value Added Tax and monetary policies. It will help to strengthen the operation of the relevant government agencies such as Federal Board of Inland revenue, Central Bank of Nigeria, Joint tax Board and others. This study will bring government attention to other sources of revenue apart overdependence on revenue from petroleum.

The study will be restricted to the aspect of Value Added Tax that falls under the jurisdiction of the Federal Board of Inland Revenue (FBIR), Federal Inland revenue Service (FIRS). The study covers the tax revenue generated by the Federal government through VAT and the Gross Domestic Product for the period between 2001– 2010.

VII. Conceptual Framework

There are quite a number of definitions of tax or taxation depending on the qualities it possesses. According to Igbonyi (2008) these qualities include; be a compulsory payment, Be a payment to the government, Be for a common benefit, Have a known formula, Have distractive beneficiary.

In the light of the foregoing, the following definitions can be considered fair; Taxation is the compulsory payment by individuals and organization to the relevant inland or internal revenue authorities at the federal, state or local government levels (Anyafor, 1996). Taxation is a process of levying and collecting by a public authority with proper jurisdiction, of compulsory

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contributions from person or body of persons to defray cost incurred by the authority in common interest of all (Odiongenyi, 1994). A tax is simply a compulsory payment levied and the citizens by the government for the purpose of achieving its goals (Naiyeju, 1996). Anyanwu (1993) viewed VAT as a consumption tax on economic operations including imports except those exempted as par the provision of the decree. The system attracts a flat rate of 5% and initially covers items of goods and services. The tax is coerced on behalf of the government by businesses and organizations which have registered with the FIRS for VAT services.

These businesses and organizations can claim credit for this tax (called input tax) when goods are sold or service rendered. VAT returns also have to be rendered monthly to the FIRS by these registered agents. The 5% VAT is called "the output tax". Therefore the VAT payable is the output tax less the input tax and is equivalent to the VAT paid by the final consumer of the product that will be collected by the government.

VIII. Taxable Goods and Services

The under listed are the taxable goods and services under Decree 102 of 1993 (Oyebanji, 2010).

a) Goods

- All goods manufactured and assemble in Nigeria
- All goods imported into Nigeria
- All second hand goods
- All household furniture and equipment
- Petroleum and petroleum products
- Jewel and jewelry
- Textile, clothing, carpet and rug
- Beer, wine, liquor, soft drinks, treated water
- Cigarette and tobacco
- All vehicles and their spare part excluding commercial vehicles and their spare parts.
- Perfumes and cosmetics (including toiletries)
- Soap and detergent
- Mining and mineral
- Office furniture and equipment
- Electrical materials of description

b) Services

- All services rendered by financial institutions to their customers
- Accounting services
- The provision of report, advice, information or similar technical service in the following areas:
  - i. Management, financial and taxation
  - ii. Recruitment, staffing and training
  - iii. Marketing research
  - iv. Public relations
  - v. Advertising

IX. Exempted Food and Services

a) Goods

- Medical and pharmaceutical products
- Basic food items
- Books and educational materials
- Baby products
- Newspapers and magazine
- Commercial vehicles and their spare parts
- Agricultural equipment, products and veterinary medicine

b) Service

- Medical service
- Service rendered by peoples and community banks and mortgage institutions (Tabansi, 2001).

However, Decree 31 of 1996 which amended VAT Decree 1993, the schedule of taxable goods and services had been deleted. Instead, the tax is to be changed on supply and all goods and services other than those specifically exempted under the exemption schedule of the Decree.

X. Administration of Valued Added Tax in Nigeria

According to Unwabuike (1998), the success or failure of any tax depends largely on the extent of how it is properly managed. The extent of the tax is interpreted and implemented as well as the publicity brought into it will determine how the particular tax is able to meet it objective. Hence one of the acid tests in the determination of the success of a tax is the management of the policy; Richard (1993) concluded that "the successful execution of fiscal policies depends not only on the quality of public administration but also on the formulation of policies that are realistically adapted to the available resources". The Value Added Tax (VAT) may be complicated to administer but it is not complex as personal or company income tax.

According to Soyede and Kajola (2006) there are five district bodies on which the administration of VAT rest in Nigeria. They are inter-related and the function of each is complimentary to those of the others.

They are;

a. The board (Federal Board of Inland Revenue)
b. The service (Federal Inland Revenue Service)
c. The technical committee
d. The Nigerian custom service
e. The VAT directorate

Other sub-internal in include:

a. The state Internal Revenue Services
b. The Zonal Officer
c. The local VAT offices

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XI. Effectiveness of Vat on Wealth Creation in Nigeria

An appraisal of the operation of VAT in Nigeria is expected to unravel the extent to which it has assisted the state in its objective of wealth creation and development. From the classical perspective, the Nigeria VAT system might be examined on three touchstones, namely; efficiency, administrative convenience and equity.

The efficiency criterion as Adedeji (1996) put it, embraces administrative and equity as well as fiscal autonomy especially in the federal fiscal system like Nigeria. He further states the following ways of determining or measuring VAT effectiveness in Nigeria, which include;

Budget Objective: The validity of an exclusive tax appraisal is dependent on two factors; the extent of information government have about the macro-economic variables including the potential of VAT and how much control they have over such externalities as political system, the rate of inflation and the overall tax system. The assumption that the degree of under or over estimation of the tax potential are not too disproportionate to the tax base. The more realistic a tax estimate it vis a viz the taxable capacity, the easier it is to assess tax effort.

The most reasonable index of the capacity of VAT to accelerate economic growth and wealth creation is its effectiveness in mobilizing privately held resources, which automatically should boost public revenue, enhance consumption patterns, generate savings and as well create wealth for the economy. In the first year of administration of VAT, Nigeria government estimated that as much as N6 billion should be the target revenue. This translated to the fact that the tax was projected to achieved in only six months about 150% of what the sales tax achieved in four and half years (Ijewere, 2003).

Comparative Appraisal: This simply means assessing the level of effectiveness of various forces within the system by juxtaposing them among each other. The incontestable financial productiveness of VAT viz-a-viz other taxes in fiscal territory is however, the strongest comparative determinant in the Nigeria tax system (Adedeji 1996).

Cost Effectiveness: The implementation of VAT in Nigeria was marked by apprehensions that going by the broadness of the base, the cost of monitoring would be too high. Not only that, there was presumption that administrative costs would consumed heavily, the estimated revenue leaning government with a low net yield. FIRS itself, is keen on keeping cost far below revenue from VAT to the fiscal market on the strength of only 36 local VAT official nationwide at the inception of the tax. It is internationally accepted that the capital for financing a tax project should neither be more than 10% of the yield nor less than 5% of the estimated revenue for an efficient tax administration (Aluko, 1999).

Concentration and Dispersion Effect: Tanzi (1991) as cited by Obadimi (1994) the introduction of VAT in Nigeria did not only eliminate the sales tax levied at differential rate but also eliminated certain classes of tax which were no longer effective. He specified what he termed concentration and dispersion indices to effective tax system.

Management by Objective: Although government is to every conscious tax officer an economic institution. "To emphasis only profit misdirects managers to the point where they endanger the survival of the business". This strategy of management by objectives was propounded by Drucker (1968) as cited in Adedeji (1996).

Isah (1997) concludes that VAT has far reaching effective on wealth creation and economic development of Nigeria as a whole. The success story of VAT so far is a triumph of economic expertise. It is the resolve of government determination to improve the fiscal policy of this county with VAT, it is clear that the revenue of this country does not come from one section to satisfy the other sections as the case with oil revenue. It is expected that in the near future, the tax regime will ever contribute more to the gross tax yield and increase the tax portfolio of Nigeria and enhanced meaningful industrial and infrastructural development as well as wealth creation in Nigeria.

XII. Problems of Vat in Nigeria

Naiyebu (1996) identified some of the problems and listed them as follows:

Public resistance, Small enterprise exemption, Tax refund, Accounting culture, Administrative complexity, Illiteracy level and Inflation.

XIII. Theoretical Framework

This study is based on the following theories.

a) Theory of Laffer Curve

This theory was propounded by Professor Arthrun Latter; the theory explains the theoretical representation of the relationship between government revenue raised by taxation and all possible rates of taxation. The theory demonstrated with a curve (i.e. the laffer curve) which was constructed by though experiment.

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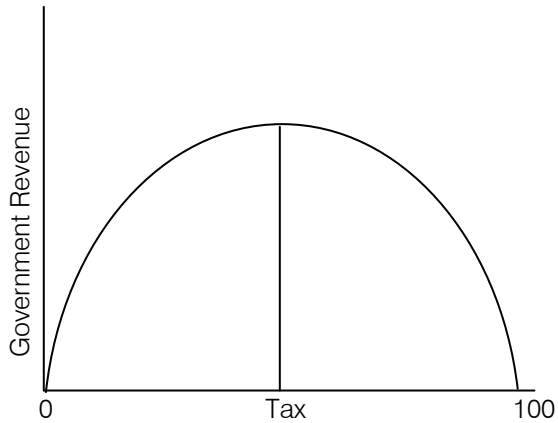

Source : Laffer 2004

It considers the amount of tax revenue raised at the extreme tax rate of 0% and 100%, he concluded that a 100% tax rate raises no revenue in the same way that a 0% tax rate raises no revenue. This is because, at 100% rate, there is no longer incentive for a rational taxpayer to earn ay income, thus, the revenue raised will be 100% of nothing. It follows that there must exist at least one rate in between where tax revenue would be a maximum. Laffer attributes the concept to Ibn Khaldun and Keynes J.M. one potential result of this theory is that, increasing tax rate beyond a certain point will become counter-productive for raising further tax revenue because of diminishing returns (Laffer 2004).

b) Ibn Khaldun's Theory of Taxation

This theory was explained in term of two different effects, the arithmetic effect and the economic effect which the VAT rate have on revenue. The two effects have opposite result on revenue in case the VAT rate are increased or decreased. According to the Arithmetic effect, if VAT rates are lowered, the VAT revenue will be lowered by the amount of the decrease in the rate. The reverse is the case for an increase in VAT rates (Ishlahi, 2006).

The economic effect however, recognized the positive impact that lower VAT rate have on work, output and employment and thereby the tax base by providing incentives to increase these activities whereas raising VAT rate has the opposite economic effect by penalizing participation in the taxed activities. At a very high VAT rate, negative economic effect dominates positive arithmetic effect, thereby, the VAT revenue declines (Ishlahi, 2006).

XIV. Research Methodology

The study adopts the historical research method in an attempt to determine the influence of Value Added Tax (VAT) on wealth creation in Nigeria. The purpose of historical research is to obtain a better understanding of the present through the evaluation of the past and intelligent prediction of the future (Adefila, 2008). The study purely used secondary data for the analysis. The use of secondary data only is because; information relating to the study is readily available from various publications of the relevant tax agencies and parastatals in Nigeria. The population of the study comprises of the record of the total tax revenue generated by the Federal Inland Revenue Service (FIRS) for 18 years from which a sample of the 10 years record was drawn based on purposive sampling techniques. The analytical tool adopted by the researcher in analyzing the data collected for the study was the descriptive statistics. This involves the use of percentage and tables. In the same vein, the study used Pearsons Product Movement Correlation Coefficient and the Student's T-Test to test the hypotheses, in order to enable the researcher to come up with decision. The use of simple percentage and tables is because they are easy to understand by the beneficiaries of the study. In the same vein, the use of Product Movement Correlation Coefficient in testing the hypothesis is to determine the extent of correlation between the two variables and most precisely the coefficient of correlation. While the Student T-Test allows for the ascertainment of the significance that exists between the variables

XV. Data Presentation and Analysis

The data presented analysis and interpreted as shown below is composed mainly of secondary data obtained from the records of the Federal Inland Revenue Service and the National Bureau of Statistics.

Table 4.1 : The Value Added Tax (VAT) and Gross Domestic Product (GDP) of Nigeria for 10 years

YEARS	VAT (N' TRILLION) X	GDP (N' TRILLION) Y	PERCENTAGE OF VAT IN GDP
2001	0.058	4.717	1.2
2002	0.092	4.910	1.9
2003	0.109	7.128	1.5
2004	0.136	8.743	1.6
2005	0.63	11.674	1.4
2006	0.193	14.735	1.3
2007	0.233	18.710	1.2
2008	0.315	20.874	1.5
2009	0.401	25.425	1.6
2010	0.481	25.490	1.9

Source : Federal Inland Revenue Service (FRIS) and Federal Bureau for Statistic (FBS), 2011

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Table 4.1 shows that N58 billion representing 1.2% of the Nigeria GDP of N4.717 trillion was generated as VAT in 2001, N92 billion representing 1.9% of GDP of 4.910 trillion as VAT in 2002, 109 billion representing 1.5% of GDP of 7.128 trillion as VAT in 2003, for 2004, 136 billion representing 1.4% GDP of 11.674 trillion was generated as VAT in 2005.

Furthermore, the table also shows that 193 billion representing 1.3% of GDP of 14.735 trillion was generated as VAT in 2006, 233 billion representing 1.2% of GDT of 18.710 for 2007, then 315 billion representing 1.5% of GDP of 20.874 trillion generated as VAT for 2008. In the same vein, 402 billion representing 1.6% of GDP of 25.425 trillion in 2009, while 481 billion representing 1.9% of the GDP of 25.490 trillion was realized by the Federal government as VAT in 2010.

Table 4.2 : The Tax Revenue and Valued Added Tax of Nigeria for 10 years

YEARS	VAT (N' TRILLION) X	GDP (N' TRILLION) Y	PERCENTAGE OF VAT IN GDP
2001	0.058	0.455	12.7
2002	0.092	0.587	15.7
2003	0.109	0.434	25.1
2004	0.136	0.698	19.5
2005	0.63	1.000	16.3
2006	0.193	1.741	11.1
2007	0.233	1.863	12.5
2008	0.315	1.841	17.1
2009	0.401	2.972	13.5
2010	0.481	2.196	21.9

Source : Federal Inland Revenue Service (FRIS) 2011

Table 4.2 shows that 58 billion representing 12.7% of the total tax revenue of 455 billion generated in 2001 was from VAT, also, 92 billion generated by the federal government representing 15.7% of the total tax in 2002 was from VAT, while 109 billion or 25.1% of the total tax of 434 billion in 2003 was equally from VAT, then in 2004, VAT of 136 billion constitutes 19.5%

Total tax of 698 billion in 2005, 163 billion representing 16.3% of total tax revenue of 1 trillion realized through VAT furthermore, the table also shows that 193 billion representing 11.1% of the total tax revenue of 1.741 trillion generated by the federal government in 2006 was from VAT, while 233 billion or 12.5% of the total tax of 1.863 trillion in 2007 was through VAT. In 2008, VAT generated 315 billion representing 17.1% of total tax of 1.841 trillion, in the same vein 401 billion was realized in 2009 as VAT representing 13.5% of total revenue of 2.972 trillion and finally, in 2010, 481 billion representing 21.9% of total tax revenue of 2.196 trillion was from VAT.

XVI. Test of Hypotheses

The data in table 4.1 was used to test H_{01}: while table 4.2 was used for hypothesis two (H_{02}).

a) Test of Hypothesis One

H_{01} : Revenue Generated through VAT has no significant Influence on Wealth creation in Nigeria.

Table 4.3 : Contingency Table

S/No	X (N' Trillion)	Y (N' Trillion)	X^2 (N' Trillion)	Y^2 (N' Trillion)	XY (N' Trillion)
1	0.058	4.717	0.003	22.250	0.274
2	0.092	4.910	0.008	24.108	0.452
3	0.109	7.128	0.012	50.808	0.777
4	0.136	8.743	0.018	76.440	1.189
5	0.163	11.674	0.027	136.282	1.903
6	0.193	14.735	0.037	217.297	2.845
7	0.233	18.710	0.054	350.064	4.359
8	0.315	20.874	0.099	435.724	6.575
9	0.401	25.425	0.161	646.431	10.195
10	0.481	25.490	0.231	649.740	12.261
	$\sum X = 2.182$	$\sum Y = 142.406$	$\sum X^2 = 0.65$	$\sum Y^2 = 2608.967$	$\sum XY = 40.829$

Source : Survey 2012

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By apply the formular for Pearson Product Moment Correlation Co-efficient

$$r = \frac{\sum XY - \sum X \sum Y}{\sqrt{[n\sum X^2 - (\sum X)^2]\,[n\sum Y^2 - (\sum Y)^2]}}$$

Where:

r	=	Correlation coefficient
X	=	Value Added tax (VAT)
Y	=	Gross Domestic Product (GDP)
n	=	Number of Years

$$\therefore \quad r = \frac{10(40.829) - (2.182)(142.406)}{\sqrt{[10(0.65) - (2.182)^2]\,[10(2608.967) - (142.406)^2]}}$$

$$r = \frac{97.57}{\sqrt{1.739 \text{ X } 5810.201}}$$

$$r = \frac{97.57}{\sqrt{10103.940}}$$

$$r = \frac{97.57}{100.52}$$

$$r = 0.97$$

This shows a very high positive correlation between Value Added Tax and the Gross Domestic product of the Nigeria economy. This reflects a high positive influence Value Added Tax has on wealth creation in Nigeria.

However, to test the significance of this positive correlation coefficient, the researcher converted the value of "r" to "t" score with the following formula as provided by Healey (1993).

$$t = \frac{r\sqrt{n - 2}}{1 - r^2}$$

Where:

t	=	The needed significance of correlation coefficient
n	=	The number of sample population
r	=	The already determined correlation coefficient
n – 2	=	The degree freedom
r^2	=	The coefficient of determination

In applying the formula

$$t = \frac{0.97\sqrt{10 - 2}}{1 - 0.97^2}$$

$$t = \frac{0.97\sqrt{8}}{1 - 0.9409}$$

$$t = \frac{0.97\sqrt{8}}{0.059}$$

$$t = 0.97(11.64)$$

The critical table value is 2.306 at 5% alpha level of significance and degree of freedom is 8.

i. *Decision Rule*

Since the t – calculated value of 11.29 is greater than the t – table value of 2.306, the Null hypothesis (H_0) is therefore rejected. Hence, revenue generated through VAT has significance on wealth creation in Nigeria.

b) Testing of Hypothesis Two

H_{02}: Revenue generated through VAT has no significant effect on the overall tax revenue in Nigeria

The Pearson Product Moment Correlation Coefficient was used to measure the strength of relationship that exists between VAT and the overall tax revenue in Nigeria. Where:

r = The Correlation Coefficient
X = Value Added Tax (VAT)
Y = Overall Tax Revenue
n = Number of Years

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Table 4.4 : Contingency Table

S/No	X (N' Trillion)	Y (N' Trillion)	X^2 (N' Trillion)	Y^2 (N' Trillion)	XY (N' Trillion)
1	0.058	0.455	0.003	0.207	0.026
2	0.092	0.587	0.008	0.345	0.054
3	0.109	0.434	0.012	0.188	0.047
4	0.136	0.698	0.018	0.487	0.095
5	0.163	1.000	0.027	1.000	0.163
6	0.193	1.741	0.037	3.031	0.336
7	0.233	1.863	0.054	3.471	0.434
8	0.315	1.841	0.099	3.389	0.580
9	0.401	2.972	0.161	8.833	1.192
10	0.481	2.196	0.231	4.822	1.056
	$\sum X = 2.182$	$\sum Y = 13.787$	$\sum X^2 = 0.65$	$\sum Y^2 = 25.773$	$\sum XY = 43.983$

Source : Survey 2012

By apply the formular for Pearson Product Moment Correlation Co-efficient

The critical table value is 2.306 at 5% alpha level of significance and degree of freedom is 8.

$$r = \frac{\sum XY - \sum X \sum Y}{\sqrt{[n\sum X^2 - (\sum X)^2]\,[n\sum Y^2 - (\sum Y)^2]}}$$

$$\therefore \quad r = \frac{10(3.983) - (2.182)(13.787)}{\sqrt{[10(0.65) - (2.182)^2]\,[10(25.773) - (13.787)^2]}}$$

$$r = \frac{97.57}{\sqrt{1.739 \times 67.649}}$$

$$r = \frac{97.57}{\sqrt{11.642}}$$

$$r = \frac{97.57}{10.85}$$

$$r = 0.90$$

This shows a very high positive correlation between Value Added Tax and the Overall tax revenue in Nigeria. However, to test the significance of this positive Correlation coefficient, the researchers also correct the value of "r" to "t" score and apply the formular.

$$t = 0.97\sqrt{\frac{10 - 2}{1 - 0.97^2}}$$

$$t = 0.97\sqrt{\frac{8}{1 - 0.9409}}$$

$$t = 0.97\sqrt{\frac{8}{0.059}}$$

$$t = 0.97(6.49)$$

$$t = 5.84$$

i. *Decision Rule*

Since the t – calculated value of 5.84 is greater than that t – table value of 2.306 the null hypothesis (H_0) is therefore rejected and the alternate hypothesis accepted, hence, revenue generated through Value Added Tax has significant effect on the Overall tax revenue in Nigeria.

XVII. Summary of Findings

Based on the analysis and test of hypothesis, the following findings were unraveled:

i. It empirically shows that Value Added Tax (VAT) revenue has significant influence on wealth creation in Nigeria as there exist a positive correlation between VAT and Gross Domestic product. It is on this note that the influence of VAT on wealth creation in the nation cannot be overemphasis. This is in general with the findings of Jayede (1993) as cited Ayua (1994) that tax incentives has a positive impact on investment decision, and tax incentives coupled with political stability stimulates economic growth as well as wealth creation.

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ii. The study also revealed that there is a very high positive correlation between Valued Added Tax (VAT) and the Overall Tax Revenue in Nigeria as the former has statistical effect in the latter.

XVIII. Conclusion

From the findings of this study, it has been discovered that Valued Added Tax (VAT) is the bedrock of wealth creation in Nigeria as well as economic development as it contribute significantly to the nation's Gross Domestic Product (GDP). Therefore, government must give adequate attention to taxation in general and VAT in particular under a stable and conducive socio-political and economic atmosphere. The effect of VAT on the Overall Tax Revenue in Nigeria is very significant, as the former contributes a very high portion in the latter. If the administration of VAT is strengthened and the compliance rate is high, government will generate more revenue through VAT and the dividend of democracy can be effectively delivered in the light of good governance. Finally, effective VAT would off-set other challenges of the nation such as inadequate and dilapidated infrastructure, complicated and antiquated tax laws, bureaucratic complexities and week administration of the other forms of tax.

XIX. Recommendations

The following recommendations are made to achieve the objective of wealth creation through VAT;

i. There should be constant review of existing tax laws every four months as that of the United State of America and other advanced economics, so as to keep the act in pace with the economic reality.

ii. There should be stringent penalty imposed on any individual or corporate body who indulge in any form of VAT malpractices irrespective of states, if the high correlation between VAT and Overall Tax Revenue in Nigeria should be maintained.

iii. There should be constant training and re-training of VAT administrators through seminars, conference to keep them abreast with the modern trend in tax administration.

iv. Government through Federal Inland Revenue Service should create an effective and reliable data base for every vatable persons to minimize (if not eliminate) the incidence of tax evasion. In the same vein, the entire tax system should be overhauled to discourage tax avoidance as VAT payers are ever willing to take advantage of loopholes in the tax system to reduce their tax liabilities.

v. Effective VAT offices should be established in every community in Nigeria so that the numerous petty traders, motor cycle operators, even the hairdressers can be made to pay VAT but with human face so as not to discourage the rural poor out of self employment.

vi. The tax payers will be willing to pay tax when the evidence of the tax paid is visible in the form of infrastructural provision. Tax frauds have been reduced to a minimum level in the people republic of China because of the capital punishment on such offences (Watt, 2009), therefore any person found guilty of tax fraud should be penalised to ensure greater faithfulness in remitting VAT proceeds for the general good of the populace.

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A Study on Management of Non Performing Assets in Priority Sector reference to Indian Bank and Public Sector Banks (PSBs)

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Abstract - In India the magnitude of the problem of bad debts was not taken seriously. Subsequently, following the recommendations of Narasimham committee and Verma committee, some steps have been taken to solve the problem of old NPAs in the balance sheets of the banks. It continues to be expressed from every corner that there has rarely been any systematic evaluation of the best way of tackling the problem. There seems to be no unanimity in the proper policies to be followed in resolving this problem. There is also no consistency in the application of NPA norms, ever since these have been recognized. Non Performing Assets are also called as Non Performing Loans. It is made by a bank or finance company on which repayments or interest payments are not being made on time. A loan is an asset for a bank as the interest payments and the repayment of the principal create a stream of cash flows. It is from the interest payments that a bank makes its profits. The problem of NPA is not limited to only Indian public sector banks, but it prevails in the entire banking industry. Major portion of bad debts in Indian Banks arose out of lending to the priority sector at the dictates of politicians and bureaucrats. If only banks had monitored their loans effectively, the bad debt problem could have been contained if not eliminated. The top management of the banks was forced by politicians and bureaucrats to throw good money after bad in the case of unscrupulous borrowers. Agriculture advances have registered a 7 fold net increase, SSI advances have set a record net increase of 8.5 times and the advances to other priority sector have made a net increase of 4.5 times, that of their respective figures in 2001–02.

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A STUDY ON MANAGEMENT OF NON PERFORMING ASSETS IN PRIORITY SECTOR REFERENCE TO INDIAN BANK AND PUBLIC SECTOR BANKS PSBS

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B.Selvarajan [α] & Dr. G. Vadivalagan [σ]

Abstract - In India the magnitude of the problem of bad debts was not taken seriously. Subsequently, following the recommendations of Narasimham committee and Verma committee, some steps have been taken to solve the problem of old NPAs in the balance sheets of the banks. It continues to be expressed from every corner that there has rarely been any systematic evaluation of the best way of tackling the problem. There seems to be no unanimity in the proper policies to be followed in resolving this problem. There is also no consistency in the application of NPA norms, ever since these have been recognized. Non Performing Assets are also called as Non Performing Loans. It is made by a bank or finance company on which repayments or interest payments are not being made on time. A loan is an asset for a bank as the interest payments and the repayment of the principal create a stream of cash flows. It is from the interest payments that a bank makes its profits. The problem of NPA is not limited to only Indian public sector banks, but it prevails in the entire banking industry. Major portion of bad debts in Indian Banks arose out of lending to the priority sector at the dictates of politicians and bureaucrats. If only banks had monitored their loans effectively, the bad debt problem could have been contained if not eliminated. The top management of the banks was forced by politicians and bureaucrats to throw good money after bad in the case of unscrupulous borrowers. Agriculture advances have registered a 7 fold net increase, SSI advances have set a record net increase of 8.5 times and the advances to other priority sector have made a net increase of 4.5 times, that of their respective figures in 2001–02. The overall Priority sector advances have registered a 6.5 fold increase over that of 2001–02 in 10 years period. Indian Bank has been successful in controlling the NPAs. The NPAs have been reduced from `791.98 crores in 2001-02 to `223.00 crores in 2008-09. However in 2009-10 and 2010-11, the NPAs have grown at an alarming rate from `223 crores in 2008-09 to `495.00 crores in 2010-11 in two years. However, Indian Bank could register a net decrease in NPAs by `296.98 crores in 10 years. In case of Public Sector Banks, the NPAs have shown a slow decreasing trend from 2001-02 to 2005-06 and then there are fluctuations upto 2010-11. An alarming increase in NPAs in Public Sector Banks is seen in 2009-10 and 2010-11 and registered a net increase of `16105.66 crores in 10 years. The growth of Indian Bank's lending to Priority sector is more than that of the Public Sector Banks as a whole. In case of NPA management, the performance of Indian Bank is better than that of Public Sector Banks as a whole.

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I. Introduction

For any nation, banking system plays a vital role in the development of its sound economy. India is not an exception. Bankers are the custodians and distributors of the liquid capital of the country. The foremost function of the banking system is to mobilize the savings of the people by accepting deposits from the public. The banker becomes the trustee of the surplus balances of the public. Here-in-lies the onerous duty of the banker is in stimulating the mobilization of surpluses. Well - knit banking systems secure a good foundation for a Nation's Industrial and Economic Progress. The role of banking in promoting development and growth, especially in the context of planning to break the vicious cycle of poverty and to retrieve the economy from the trap of under-development is a matter of paramount importance, particularly when our country is on the way of development. Deposit mobilization promotes the economic prosperity by controlling the money circulation and canalizing for development and productive purposes. In order to mobilize deposits, the commercial banks undertake deposit mobilization through various deposit schemes suited to the different sections of the people. As the growth of the bank deposits is the key element in the progress of the banking business, bankers spend more time and man power in the mobilization of deposits. The deposits along with other sources of funds, namely, capital, reserves and borrowings, form the sources of funds for the banks. The lending and investment activities of the bank are based on the sources of funds.

In India the magnitude of the problem of bad debts was not taken seriously. Subsequently, following the recommendations of Narasimham committee and Verma committee, some steps have been taken to solve the problem of old NPAs in the balance sheets of the banks. It continues to be expressed from every corner that there has rarely been any systematic evaluation of the best way of tackling the problem. There seems to be no unanimity in the proper policies to be followed in

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resolving this problem. There is also no consistency in the application of NPA norms, ever since these have been recognized. NPA concerns of individual banks summarized as a whole and expressed as a mathematical average, for the entire bank cannot convey a dependable picture. The scenario is not so simple to be generalized for the industry as a whole to prescribe a readymade package of a common solution for all banks and for all times.

II. Concept of NPA

The banks, in their books, have different kind of assets, such as cash in hand, balances with other banks, investment, loans and advances, fixed assets and other assets. The Non Performing Asset (NPA) concept is restricted to loans, advances and investments. As long as an asset generates the income expected from it and does not disclose any unusual risk other than normal commercial risk, it is treated as performing asset, and when it fails to generate the expected income it becomes a "Non Performing Asset". In other words, a loan asset becomes a Non Performing Asset (NPA) when it ceases to generate income, i.e. interest, fees, commission or any other dues for the bank for more than 90 days. A NPA is an advance where payment of interest or repayment of installment on principal or both remains unpaid for a period of two quarters or more and if they have become 'past due'. An amount under any of the credit facilities is to be treated as past due when it remain unpaid for 30 days beyond due date.

Non Performing Assets are also called as Non Performing Loans. It is made by a bank or finance company on which repayments or interest payments are not being made on time. A loan is an asset for a bank as the interest payments and the repayment of the principal create a stream of cash flows. It is from the interest payments that a bank makes its profits. Banks usually treat assets as non-performing if they are not serviced for some time. If payments are late for a short time, a loan is classified as past due and once a payment becomes really late (usually 90 days), the loan is classified as non-performing. A high level of non-performing assets, compared to similar lenders, may be a sign of problems.

III. Statement of the Problem

Non-performing assets of banks are one of the biggest hurdles in the way of socio-economic development of India. The level of NPAs of the banking system in India is still too high. It affects the financial standing of the banks so that it is a heavy burden to the banks. A vigorous effort has to be made by the banks to strengthen their internal control and risk management systems and to setup early warning signals for timely detection and action. The problem of NPAs is tied up with the issue of legal reforms. This is an area which requires urgent consideration as the present system that substantially delays in arriving at a legal solution of a dispute is simply not tenable. The absence of a quick and efficient system of legal redress constitutes an important 'moral hazard' in the financial sector, as it encourages imprudent borrowers. NPAs can create many challenges. Some of the important challenges are:

1. Owners do not receive a market return on their capital. In the worst case, if the bank fails, owners lose their assets. In modern times, this may affect a broad pool of shareholders.
2. Depositors do not receive a market return on savings. In the worst case if the bank fails, depositors lose their assets or uninsured balance. Banks also redistribute losses to other borrowers by charging higher interest rates. Lower deposit rates and higher lending rates repress savings and financial markets, which hampers economic growth.
3. Non Performing loans epitomize bad investment. They misallocate credit from good projects, which do not receive funding, to failed projects. Bad investment ends up in misallocation of capital, labour and natural resources. The economy performs below its production potential.
4. Non Performing loans may spill over the banking system and contract the money stock, which may lead to economic contraction. This spillover effect can channelize through illiquidity or bank insolvency;

(a) When many borrowers fail to pay interest, banks may experience liquidity shortages. These shortages can jam payments across the country,
(b) Illiquidity constraints bank in paying depositors e.g. cashing their paychecks. Banking panic follows a run on banks by depositors as part of the national money stock become inoperative. The money stock contracts and economic contraction follows.
(c) Under capitalized banks exceeds the bank's capital base.

The problem of NPA is not limited to only Indian public sector banks, but it prevails in the entire banking industry. Major portion of bad debts in Indian Banks arose out of lending to the priority sector at the dictates of politicians and bureaucrats. If only banks had monitored their loans effectively, the bad debt problem could have been contained if not eliminated. The top management of the banks was forced by politicians and bureaucrats to throw good money after bad in the case of unscrupulous borrowers. Many big borrowers defaulted only due to the recession in the economy. The absence of proper bankruptcy laws and the dilatory legal procedure in enforcing security rights are the root cause of bad debts in banks. Added to these, there are

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many other reasons why public sector banks have highest level of NPAs. The NPA problem of banking institutions in India is exaggerated by deriving NPA figures based on percentage against risk assets instead of total earning assets. To improve recovery and to minimize NPAs, banks are expected to do a continuous recovery exercise through various methods adopting newer strategies. Besides, the borrowers are to be educated again and again about the benefits they derive from bank loans comparing to the local money lenders. The defaulters with genuine reason must be taken care of by the banks. But this attitude becomes an act of mockery when blanket write-off is affected. The above are various issues faced by banks related to lending and recovery. Banks cannot stop lending. Lending will continue, recovery also must be continued. This study aims at a thorough analysis of the functions of a bank in lending and recovery with special reference to Indian Bank, in the present competitive, deregulated and technologically improved banking environment.

IV. Objectives of the Study

The present study has been designed to achieve the following objectives:

- To know and study about the non-performing assets in Indian Bank, Tamil Nadu.
- To find out Non Performing Assets under the Priority sector lending in Indian Bank and Compare with Public Sector Banks (PSBs)
- To make appropriate suggestions to avoid future NPAs and to manage existing NPAs in Indian Bank.

V. Limitation of the Study

The study is limited to the functions of Indian Bank, Tamilnadu pertaining to its management of NPAs and profitability. Thus, the important limitations are as follows;

- The study on management of non-performing assets is limited to the Indian Bank.
- The data are collected from Indian Bank till the end of March, 2011.
- The basis for identifying non-performing assets is taken from the Reserve Bank of India circulars.
- Since non-performing assets are critical, bank officials are not willing to part with all the information with them.
- Reasons for NPAs and Management of NPAs are changing with the time. The study is done in the present environment without foreseeing future developments.

VI. Scope of the Study

The study has the following scope:

- The study could suggest measures for the banks to avoid future NPAs & to reduce existing NPAs.
- The study may help the government in creating & implementing new strategies to control NPAs.
- The study will help to select appropriate techniques suited to manage the NPAs and develop a time bound action plan to arrest the growth of NPAs.

VII. Research Design

The research design used to carry out this study is descriptive research because it deals with statistical data and the main aim of the report is to describe the factors affecting the problem mentioned. The present study is an analytical study. For this study, primary data and secondary data are collected. The primary data is collected from the borrowers with the help of questionnaire. The secondary data is collected from the annual reports of Indian Bank and Reserve Bank of India website.

VIII. Sources of Data

The data collected is mainly secondary in nature. The sources of data for this thesis include the literature published by Indian Bank and the Reserve Bank of India, various magazines dealing with the current banking scenario and research papers.

IX. Priority Sector Analysis

Since Nationalization of major commercial banks in 1969, banking sector has been utilized as a powerful vehicle to carry on the Government's development programmes. The priority sector activities have been given adequate financial assistance through Banks. Among the 20 point programmes announced by the Prime Minister, Mrs. Indira Gandhi, poverty alleviation, creation of employment opportunities, promotion of self employment, protection and promotion of village and cottage industries, encouraging entrepreneurs and similar socio economic development programmes were given top priority. Thus various employment generation activities, Agricultural development activities and activities related to small Scale industries have been classified under priority sector. In other words, some areas of fields in a country, depending on its economic condition or government interest are called Priority Sectors, i.e. industry and agriculture. These may further be sub-divided. Banks are directed by the central bank of the country that loans must be given on reduced rates of interest with discounts to promote these fields; such lending is called Prime Sector Lending. Priority sector was first properly announced in 1972, after the National Credit Council emphasized that there should be a larger involvement of the commercial banks in the priority sector. In 1974, the banks were given a target of 33.33 % as share of the priority sector in the total bank credit. This was later revised on the recommendation of the Dr. K S Krishnaswamy committee and raised to 40%. RBI

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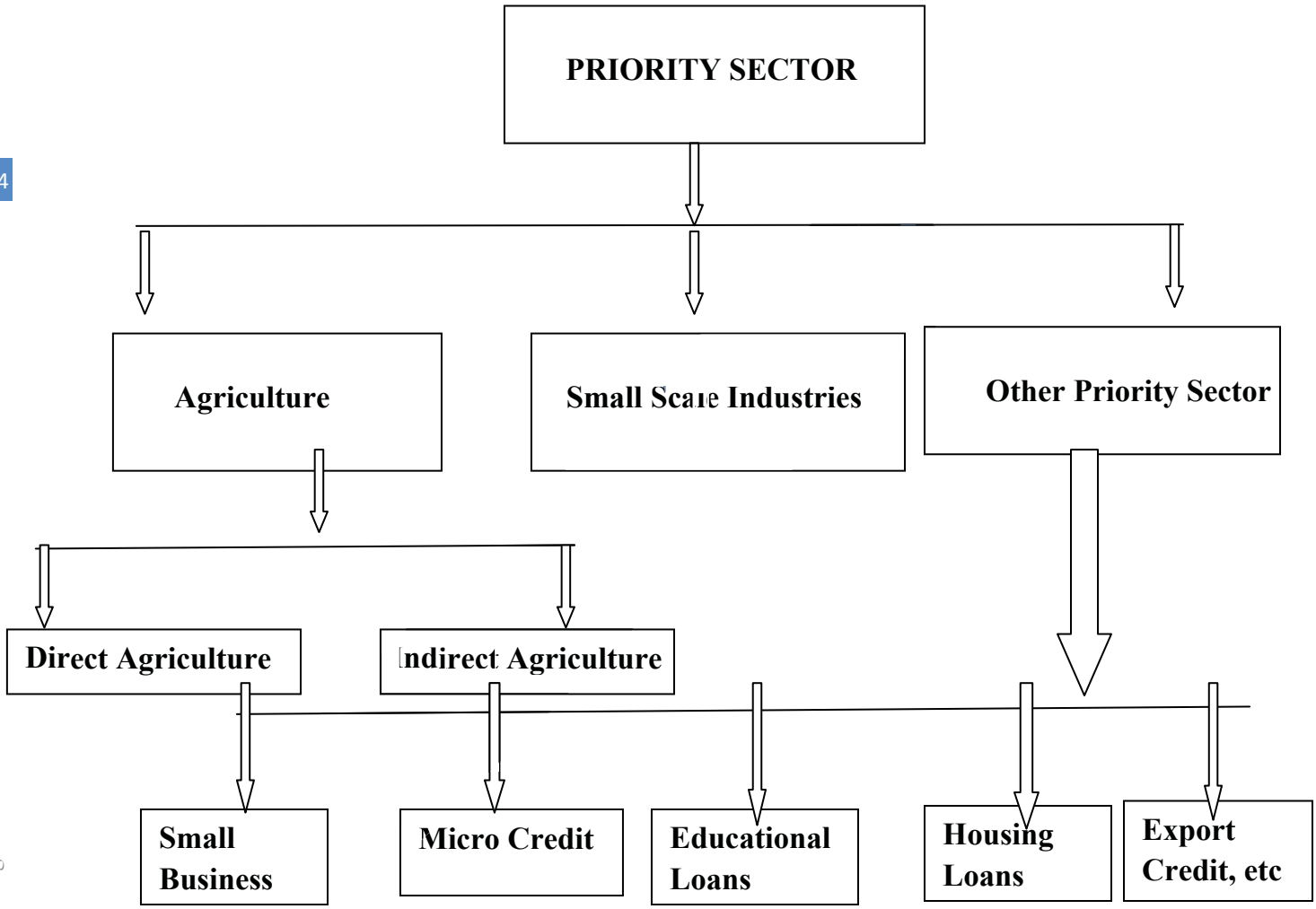
has divided the Priority Sector into the following categories. The main areas under Priority Sector Lending scheme are as follows:

1. Agriculture
2. Small Scale Industries
3. Small business/Service enterprises (small business, retail trade, professional and self employed, small road and water transport operations)
4. State sponsored organizations for SC/ST
5. Educational Loan
6. Housing Loan
7. Consumption Loan
8. Micro credit
9. Loans to software industry
10. Food and agro procession sector
11. Venture capital
12. Export credit

Broadly Priority sector is classified under three major heads as follows:



The Government of India through the instructions of Reserve Bank of India (RBI) mandates certain type of lending on the Banks operating in India, irrespective of their origin. RBI sets targets in terms of percentage (of total money lent by the Banks) to be lent to certain sectors, which in RBI's perception would not have access to organized lending market or could not afford to pay the interest at the commercial rate. This type of lending is called Priority Sector Lending. Financing of Small Scale Industry, Small business, Agricultural Activities, Export activities and the activities narrated in the previous paragraphs are fall under this category.

a) Analysis of advances granted to Agriculture by Public Sector Banks (PSBs) and by Indian Bank in Particular

This analysis will help to evaluate the performance of Indian Bank in helping the agricultural development in India. The following few tables are prepared to study the role of Indian Bank is helping the agriculture in India.

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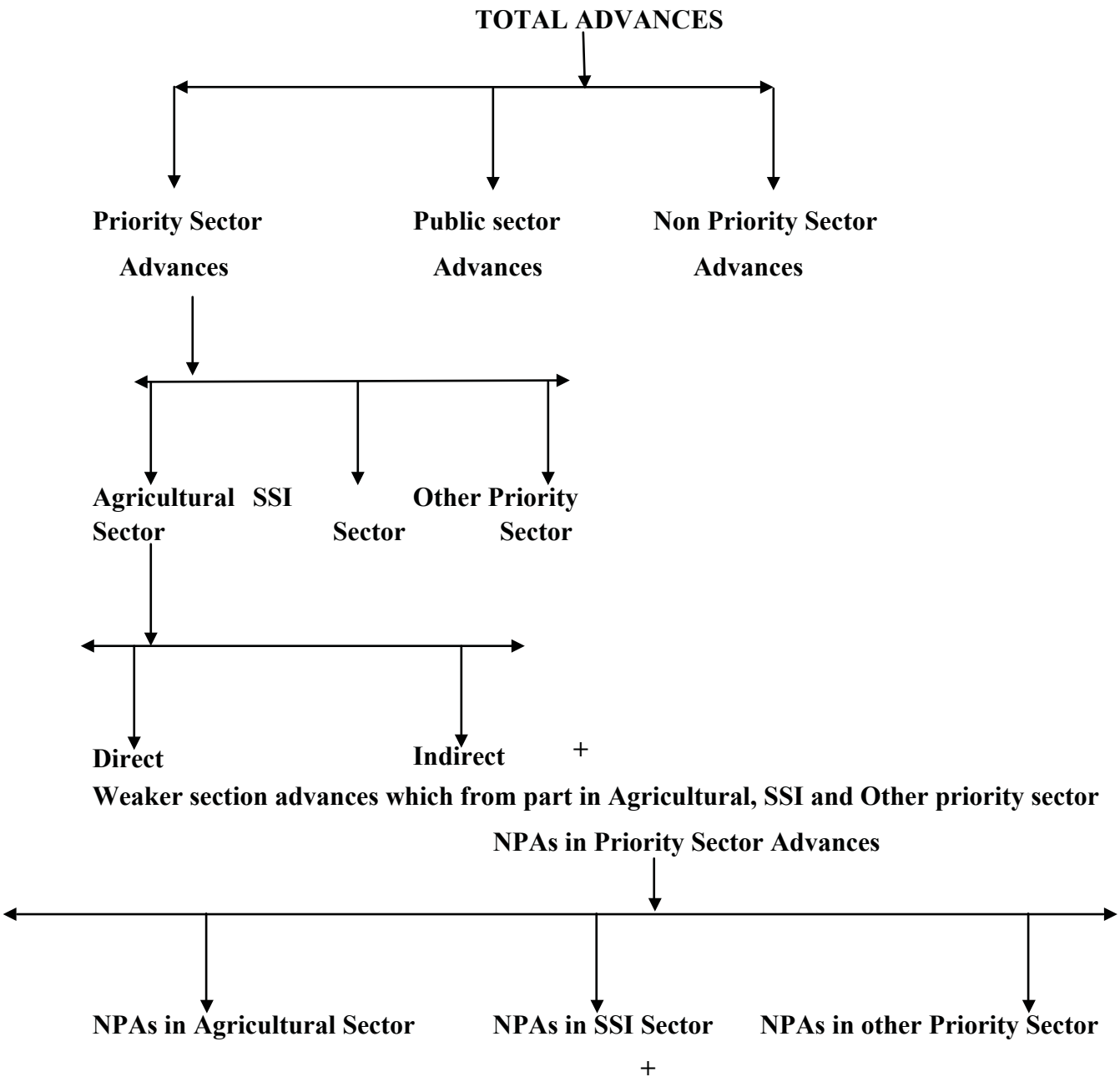

b) Priority Sector Advances – Indian Bank

Table I gives the total Priority sector advances of Indian bank. Further this table gives the quantum of advances made by Indian Bank under three major heads of Priority sector, namely, Agriculture, SSI and Other Priority sector. These figures are collected to get an idea about the lending of Indian Bank under Priority sector advances for a period of 10 years from 2001-2002 to 2010-2011.

Table 1 : Priority Sector Advances – Indian Bank

(` in Crores)

Year	Agriculture Advances	SSI Advances	Other Priority Sector Advances	Priority Sector Advances
2001 – 2002	1,526.69 (38.30%)	886.06 (22.23%)	1573.80 (39.47%)	3986.55
2002 – 2003	1850.30 (37.68%)	1003.00 (20.43%)	2056.98 (41.89%)	4910.28
2003 – 2004	2214.00 (37.08%)	978.00 (16.38%)	2779.11 (46.54%)	5971.11
2004 – 2005	3191.70 (39.38%)	1144.71 (14.12%)	3769.00 (46.50%)	8105.41
2005 – 2006	4248.69 (39.80%)	1521.00 (14.25%)	4905.80 (45.95%)	10675.49

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2006 – 2007	5656.08 (42.42%)	2364.45 (17.73%)	5314.43 (39.85%)	13334.96
2007 – 2008	6214.87 (41.53%)	3151.00 (21.06%)	5599.27 (37.41%)	14965.14
2008 – 2009	7618.00(41.96%)	3844.00(21.17%)	6695.00 (36.87%)	18157.00
2009 – 2010	9091.00 (42.42%)	5420.00 (25.29%)	6922.00 (32.29%)	21433.00
2010 - 2011	10986.00 (42.96%)	7549.00 (29.52%)	7038.00 (27.52%)	25573.00
Total	52597.33 (41.38%)	27861.22 (21.91%)	46653.39 (36.71%)	127111.94
Mean	5259.733 (41.38%)	2786.12 (21.91%)	4665.34 (36.71%)	12711.19
Net Increase	9459.31 (41.38%)	6662.94 (21.91%)	5464.20 (36.71%)	21586.45

Source : RBI, Trend & Progress Reports

From the above table it is very clear that Indian Bank has been granting advances to priority sector with an annual growth in every successive year. Thus the growth of Priority sector advances in Indian Bank has set a positive growth throughout the decade of study. Agriculture advances have registered a 7 fold net increase, SSI advances have set a record net increase of 8.5 times and the advances to other priority sector have made a net increase of 4.5 times, that of their respective figures in 2001–02. The overall Priority sector advances have registered a 6.5 fold increase over that of 2001–02 in 10 years period. The Indian Bank has been making advances to Priority sector advances with due share to its major components viz., Agriculture, SSI and Other priority sector.

a) NPAs in priority sector advances – Indian bank

Table II provides the data related to NPAs in Indian Bank ith reference to Priority sector advances. Also it provides classified NPA figures under the three major components, namely, Agriculture, SSI and other Priority sector.

Table 2 : NPAs In Priority Sector Advances – Indian Bank

(` in Crores)

Year	NPAs in Agriculture	NPAs in SSI	NPAs in Other Priority Sector	NPAs in Priority Sector
2001 – 2002	202.76 (25.60%)	395.27 (49.91%)	193.95 (24.49%)	791.98
2002 – 2003	183.38 (24.27%)	368.16 (48.73%)	203.94 (26.99%)	755.48
2003 – 2004	164.38 (20.81%)	342.89 (43.41%)	282.64 (35.78%)	789.91
2004 – 2005	130.46 (21.13%)	265.85 (43.05%)	221.17 (35.82%)	617.48
2005 – 2006	110.39 (19.86%)	238.96 (42.99%)	206.50 (37.15%)	555.85
2006 – 2007	62.72 (13.83%)	181.13 (39.94%)	209.63 (46.23%)	453.48
2007 – 2008	47.00 (16.26%)	161.00 (55.71%)	81.00 (28.03%)	289.00
2008 – 2009	27.00 (12.11%)	77.00 (34.53%)	119.00 (53.36%)	223.00
2009 – 2010	55.00 (22.09%)	163.00 (65.46%)	31.00 (12.45%)	249.00
2010 – 2011	219.00 (44.24%)	141.00 (28.48%)	135.00 (27.27%)	495.00
Total	1202.09 (23.02%)	2334.29 (44.72%)	1683.33 (32.25%)	5220.18
Mean	120.20 (23.02%)	233.42 (44.72%)	168.33 (32.25%)	522.01

Source: RBI, Trend & Progress Reports

There exists a general opinion that banks have more NPAs in the advances made to Priority sector, as the borrowers under priority sector do not have sufficient means to repay the loans. The above table gives information that Indian Bank could reduce the NPAs in Priority sector advances from `791.98 crores in 2001–02 to `223.00 crores in 2008–09. However the NPAs increased to `495 crores in 2010–11. In agriculture advances the NPAs are reduced by `175.76 crores in 8 years and thereafter it increased. In case of SSI advances the NPAs reduced by `318.27 crores during the same 8 years. In case of other priority sector NPAs fell down to `31 crores from `193.95 crores in 9 years. During the year 2009-10 and 2010–11, the NPAs have raised alarmingly at a higher rate of growth. Indian Bank must be vigilant and the rising trend in NPAs must be arrested immediately.

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b) Priority sector advances & npas

Table III gives data of both Priority Sector advances and related NPAs for Indian Bank as well as for all Public Sector Banks as a whole. Further the ratio of NPAs in Priority Sector advances to the total Priority Sector advances is calculated and given for all the 10 years for both Indian Bank and for all Public Sector Banks as a whole. This table will facilitate to compare the performance of Indian Bank in making advances to Priority sector and managing the NPAs with that of total Public Sector Banks as a whole.

Table 3 : Priority Sector Advances & NPAs

(` in Crores)

Year	PSBs Priority sector advances	PSBs NPAs in Priority sector	%	Indian bank Priority sector Advances	Indian Bank NPAs in Priority sector	%
2001 – 2002	171185.26	25139.34	14.68	3986.55	791.98	19.86
2002 – 2003	203094.92	24938.36	12.28	4910.28	755.48	15.38
2003 – 2004	245671.75	23840.33	9.70	5971.11	789.91	13.22
2004 – 2005	310093.30	23397.38	7.55	8105.41	617.48	7.62
2005 – 2006	410379.05	22373.74	5.55	10675.49	555.85	5.21
2006 – 2007	521180.24	22953.62	4.40	13334.96	453.48	3.40
2007 – 2008	608962.89	25286.67	4.15	14965.14	289.00	1.93
2008 – 2009	719497.00	24318.00	3.38	18157.00	223.00	1.22
2009 – 2010	864562.00	30848.00	3.57	21433.00	249.00	1.16
2010 - 2011	1028616	41245.00	4.01	25573.00	495.00	1.93
Total	5083242.41	264340.44	5.20	127111.94	5220.18	4.11
Mean	508324.24	26434.04	5.20	12711.19	522.01	4.11

Source : RBI, Trend & Progress Reports

The table explains that Priority sector advances in Indian Bank have set a record of continuous growth with annual positive increase in the quantum of advances. Similar increasing trend is registered in case of Priority sector advances of Total Public Sector Banks. This table established an important fact that Indian Bank's performance in making advances to priority sector is almost around 2.5% of the priority sector advances of Public Sector Banks. Thus the growth in priority sector advances in Indian Bank is in tune with the growth in the priority sector advances of total Public Sector Banks. In case of NPAs in Priority Sector advances, Indian Bank has been successful in controlling the NPAs. The NPAs have been reduced from `791.98 crores in 2001-02 to `223.00 crores in 2008-09. However in 2009-10 and 2010-11, the NPAs have grown at an alarming rate from `223 crores in 2008-09 to `495.00 crores in 2010-11 in two years. However, Indian Bank could register a net decrease in NPAs by `296.98 crores in 10 years. In case of Public Sector Banks, the NPAs have shown a slow decreasing trend from 2001-02 to 2005-06 and then there are fluctuations upto 2010-11. An alarming increase in NPAs in Public Sector Banks is seen in 2009-10 and 2010-11 and registered a net increase of `16105.66 crores in 10 years. Thus the total Public sector Banks as a whole have failed in controlling the NPAs as is seen from their performance in 10 years from 2001-02. While comparing with the performance of lending to priority sector, Indian Bank is in tune with that of all Public Sector Banks. But in case of managing NPAs, Indian Bank has shown its potentials and efficiency in controlling NPAs as it could minimize the NPAs in 10 years. During the same period NPAs have gone up in case of all Public sector Banks in total. Thus this table gives an inference that Indian Bank is above the industry level in its best management of NPAs.

c) Agriculture Advances - Psbs & Indian Bank

Table No IV is formulated with the data regarding the NPAs in agriculture advances in Indian Bank and in the Public Sector Banks as a whole for the study period of 10 years from 2001-02. This table also gives the figures of total agriculture advances made by Indian Bank as well as the total Public Sector Banks. Besides the quantum of agricultural advances and quantum of NPAs in agriculture advances, the table also exhibits the percentage of NPAs in Public Sector Banks and percentage of NPAs in Indian Bank with reference to their total agriculture advances respectively. These data help to evaluate the performance of NPA management in Indian Bank in comparison to that of Public Sector Banks as a whole.

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Table 4 : Agriculture Advances - PSBs & Indian Bank

(` in Crores)

Year	PSBs Agriculture Advances	PSBs NPAs in Agriculture Sector	%	Indian bank Agriculture Advances	Indian bank NPAs in Agriculture Sector	%
2001 – 2002	63082.99	7821.54	12.39	1526.69	202.76	13.28
2002 – 2003	73507.06	7707.35	10.48	1850.30	183.38	9.91
2003 – 2004	86186.77	7240.30	8.40	2214.00	164.38	7.42
2004 – 2005	112474.95	7254.05	6.45	3191.70	130.46	4.08
2005 – 2006	154900.12	6202.92	4.01	4248.69	110.39	2.59
2006 – 2007	205090.96	6506.34	3.17	5656.08	62.72	1.11
2007 – 2008	248685.26	8268.03	3.32	6214.87	47.00	0.756
2008 – 2009	296858	5708.00	1.92	7618.00	27.00	0.354
2009 – 2010	370729	8330.00	2.24	9091.00	55.00	0.604
2010 - 2011	414990.00	14487.00	3.49	10986.00	219.00	1.99
Total	2026505.11	79525.53	55.89	52597.33	1202.09	42.12
Mean	202650.51	7952.55	3.92	5259.73	120.20	2.29

Source : RBI, Trends & Progress reports

Prevalence of NPAs in a bank in any type of advance is inevitable. But the growth in NPAs affects the growth in advances; it poses threat to the Bank's credit performance. The above table states clearly that Indian Bank has been successful in containing the NPAs in agriculture advances upto the year 2008-09. The decreasing trend of NPAs level has been reversed from 2009-10 and the NPAs increased very sharply to touch the highest level of the decade (`219.00 crores). Though the quantum of NPAs have shown a net increase of `16.24 crores in 10 years (`219.00 crores-`202.76 crores), the percentage of NPAs to total agriculture advances is reduced from 13.28 to 1.99. Another interesting inference is that, the net increase in total agriculture advances is `29459.31 crores, the net increase in NPAs is `16.24 crores in 10 years and the percentage of net increase of NPAs on net increase of agriculture advances is less than 0.2 only. Thus Indian Bank takes cautious approach in lending and takes steps to control NPAs.

In case of Public Sector Banks, it is evident that NPAs in agriculture advances have been controlled effectively upto 2008-09 and thereafter the NPAs increased sharply. Thus decrease in NPAs in Indian Bank upto 2008-09 is in tune with that of Public Sector Banks as a whole. Further, the NPAs increased sharply in the years 2009-10 and 2010-11 both in Indian Bank as well as in the whole of Public Sector Banks. So, the inference is 2009-10 and 2010-11 are the years in which NPAs increased in all the banks. As in the case of Indian Bank, in Public Sector Banks also, there is a net increase in the quantum of NPAs (`6665.46 crores) in 10 years, but in Public Sector Banks the percentage of NPA to total agriculture advances has come down from 12.39 in 2001-02 to 3.49 in 2010-11. A careful study of this table 4.9 indicates clearly that the NPA management of Indian Bank is better than the NPA management of Public Sector Banks as a whole. This is evidenced by the fact that the percentage of NPAs to agriculture advances in Indian Bank is always less than that of Public Sector Banks throughout the decade of study. (Mean NPA percentage to Indian Bank is 2.29and Mean NPA percentage of Public Sector Banks is 3.92). Indian Bank's Management has to be appreciated for its judicious lending and effective control of NPAs simultaneously. However, the sharp growth of NPAs in the years 2009-10 and 2010-11 gives an alarming signal to the management of Indian Bank. Indian Bank has to take adequate and appropriate steps to reverse this growing trend in NPAs as quickly as possible.

d) PSBs & Indian bank – ssi advances

Table V picturises information about SSI advances made by Indian Bank as well as whole of Public Sector Banks for the period of 10 years from 2001–02. The data given in the table, namely the quantum of SSI advances, quantum of NPAs related to SSI advances and percentage of NPAs in SSI advances are duly tabulated in case of Indian Bank and Public Sector Banks as a whole. The data given in this table helps to analyze the management efficiency, in controlling NPAs both of Indian Bank and of the whole of Public Sector Banks. Their performance in NPA management may also be compared.

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Table 5 : PSBs & Indian Bank – Ssi Advances

(` in Crores)

Year	PSBs SSI Advances	PSBs NPAs in SSI Advances	%	Indian bank SSI Advances	Indian bank NPAs in SSI Advances	%
2001 – 2002	51186.87	10583.95	20.67	886.06	395.27	44.61
2002 – 2003	52987.00	10161.53	19.17	1003.00	368.16	36.71
2003 – 2004	58310.00	8837.92	15.15	978.00	342.89	35.06
2004 – 2005	67634.00	7834.96	11.58	1144.71	265.85	23.22
2005 – 2006	82492.00	6917.40	8.38	1521.00	238.96	15.71
2006 – 2007	104703.00	5843.28	5.58	2364.45	181.13	7.66
2007 – 2008	148651.00	5804.75	3.90	3151.00	161.00	5.11
2008 – 2009	190968.00	6984.00	3.65	3844.00	77.00	2.00
2009 – 2010	264828.00	11537.00	4.35	5420.00	163.00	3.01
2010 - 2011	376627.00	14340.00	3.81	7549.00	141.00	1.86
Total	1398386.87	88844.79	6.35	27861.22	2334.29	8.38
Mean	139838.68	8884.47	6.35	2786.12	233.42	8.38

Source : RBI, Trend & Progress Reports

NPAs create obstacles on the path of growth in the business of banks, particularly in the growth of credit disbursement. The above table gives the quantum of SSI advances and NPAs related to SSI advances in Indian Bank as well as that of Public Sector Banks as a whole for the period of study. Contrary to this growth, a drastic reduction is seen in NPAs with a net fall of `254.27 crores during the same period. Percentage of NPAs in total SSI advances has come down from 44.61 in 2001-02 to 1.86 in 2010-11. This continuous annual reduction of NPA percentage indicates the effective NPA management practiced in Indian Bank.

Similar to the positive growth trend in SSI advances in Indian Bank, a positive continuous growth is registered in Public Sector Banks as a whole. The SSI advances has grown 7 times in Public Sector Banks, where as in Indian Bank, the growth is 8.5 times during the same 10 years period. The percentage of NPAs in total SSI advances in Public Sector Banks as a whole has come down from 20.67 in 2001-02 to 3.81 in 2010-11. An in-depth analysis of this table indicates that the reduction rate of percentage of NPAs in SSI advances is faster in Indian Bank than in Public Sector Banks. From 2001-02 to 2007-08, the NPA percentage in SSI advances in Indian Bank is higher than that of the industry average i.e. of public sector Banks. From 2008-09, Indian Bank has shown its efficiency in controlling of NPAs and this is evidenced in this table, i.e., from 2008-09 the percentage of NPAs in Indian Bank has been less than that of the whole of Public Sector Banks. Thus Indian Bank has taken all possible steps to grant loans to SSI units and at the same time it takes judicious steps to control the NPAs.

e) PSBs & Indian Bank – Other Priority Sector Advances

Table No. VI provides the data regarding the advances made by Indian Bank as well as all Public sector Banks as a whole under other priority sector and the respective NPAs. The percentage of NPAs with references to the total other priority sector an advance has been calculated per year for both Indian Bank and Public Sector Banks as a whole. These data viz, other priority sector advances, NPAs, the percentage of NPAs for the whole period of study facilitate to assess the performance of Indian Bank in comparison with the Public Sector Banks as a whole in the areas of lending to Other Priority Sector, management of NPAs and their related trends such as increase in Other Priority Sector advances and decrease in NPAs. More particularly these data helps to evaluate the management of NPAs in Indian Bank comparing it to that of Public Sector Banks as a whole.

Table 6 : PSBs & Indian Bank – Other Priority Sector Advances

Year	PSBs Other Priority Sector Advances	PSBs NPAs in Other Priority Sector	%	Indian Bank Other Priority Sector Advances	Indian Bank NPAs in Other Priority Sector	%
2001 – 2002	56915.40	6733.85	11.83	1573.80	193.95	12.32
2002 – 2003	76621.86	7069.48	9.22	2056.98	203.94	9.91
2003 – 2004	101174.98	7762.11	7.67	2779.11	282.64	10.17

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2004 – 2005	129984.35	8308.37	6.39	3769.00	221.17	5.86
2005 – 2006	172986.93	9253.43	5.34	4905.80	206.50	4.21
2006 – 2007	211386.28	10604.01	5.01	5314.43	209.63	3.95
2007 – 2008	211626.63	11213.90	5.29	5599.27	81.00	1.45
2008 – 2009	231671.00	11626.00	5.02	6695.00	119.00	1.78
2009 – 2010	229005.00	10981.00	4.81	6922.00	31.00	0.45
2010 - 2011	236999.00	12417.00	5.23	7038.00	135.00	1.92
Total	1658371.43	95969.15	5.79	46653.39	1683.33	3.61
Mean	165837.14	9596.91	5.79	4665.34	168.33	3.61

(` in Crores)

Source : RBI, Trend & Progress Reports

Other priority sector advances are those advances made to various activities/purpose under priority sector other than agriculture and SSI. There are loans to professionals and self employed, small business, education, rural housing, small road transport operators, etc and these are classified under other priority sector advances. The above table illustrates the growth of advances to other priority sector and at the same time the fluctuations in the NPA position both in Indian Bank and in Public Sector Banks as a whole. The increase in advances to other priority sector by Indian Bank is continuous throughout the decade with annual positive growth. Similarly the growth is continuous in Public Sector Banks also except a small set back in the year 2009-10. However both Indian Bank and Public Sector Banks as a whole have registered a sizeable net growth in 10 years and the quantum of advances in 2010-11 is more than four times that of 2001-02. In case of NPAs in Indian Bank, there is no regular decrease or increase. The NPAs in Indian Bank increased annually during the first 3 years of the decade i.e. from 2001-02 to 2003-04 and thereafter decreased for 4 years from 2004-05 to 2007-08. In last three years there is increase and decrease in alternative years. But in case of Public Sector Banks, the NPAs in other priority sector advances has grown annually from 2001-02 to 2008-09 i.e. during the first 8 years. Though the quantum of NPAs has come down in 2009-10, it increased again in 2010-11. These data indicate clearly that Indian Bank has taken steps to reduce NPAs throughout the decade and succeeded to register a net decrease of `58.95 crores, where as in Public Sector Banks as a whole, the management of NPA is inadequate, as a result the net NPA has increased by `5683.15 crores in 10 years.

The percentage of NPAs to other priority sector advances in Public Sector Banks as a whole has shown an average of 5.79 for the decade, whereas the mean for Indian Bank is 3.63. During the first three years of the decade i.e., from 2001-02 to 2003-04, the NPA percentage in Indian Bank is more than that of Public Sector Banks as a whole. In the subsequent years i.e. in the remaining 7 years of the decade, Indian Bank has exhibited its success in controlling NPAs and NPA percentage. This is evidenced from the fact that the NPA percentage is less in Indian Bank than that of Public Sector Banks as a whole from the year 2004-05 to 2010-11. Indian Bank could achieve in controlling the NPAs to 1.92% in 2010-11. But in case of Public Sector Banks it is 5.23 in 2010-11. The inference is that the NPA level in Indian Bank in other priority sector advances is very much controlled when compared to the industry average i.e. that of Public sector Banks.

f) Weaker Section Advances & Npas – Psbs & Indian Bank

Table VII picturises the position of advances to weaker sections made by Indian Bank as well as the Public Sector Banks as a whole during the study period of ten years from 2001-02. Under priority sector, weaker section borrowers are in all the three major components of priority sector, namely, agriculture, small scale industry and other priority sector. Therefore weaker section advances have been taken separately for the study. This table also provides the NPA position in the advances made to weaker section borrowers with reference to Indian Bank as well as Public Sector Banks as a whole. Further, as an additional tool to analyze the data, the percentage of NPA in the total weaker section advances, both in Indian Bank and in Public Sector Banks as a whole is also given annually. The mean for all the columns is given at the end of the table to facilitate a comparative study within the performance of Indian Bank and with that of Public Sector Banks as a whole.

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Table 7 : Weaker Section Advances & NPAs – PSBs & Indian Bank

(` in Crores)

Year	PSBs Weaker Section Advances	PSBs NPAs in Weaker Section	Percentage	Indian Bank Weaker Section Advances	Indian Bank NPAs in Weaker Section	Percentage
2001 – 2002	28974.90	5743.82	19.82	845.27	181.28	21.45
2002 – 2003	32303.75	5749.23	17.79	1028.79	183.01	17.78
2003 – 2004	41588.64	6706.49	16.12	1230.78	191.74	15.57
2004 – 2005	63492.11	5752.04	9.06	1809.83	175.05	9.67
2005 – 2006	78373.90	5023.22	6.41	2498.28	178.52	7.15
2006 – 2007	94284.88	5181.15	5.49	3098.23	175.06	5.65
2007 – 2008	126934.80	5388.00	4.24	3678.52	188.40	5.12
2008 – 2009	122894.00	5074.00	4.13	4079.00	41.00	1.01
2009 – 2010	212214.00	5053.00	2.38	5206.00	9.00	0.17
2010 - 2011	246316.00	7929.00	3.22	6073.00	17.00	0.28
Total	1047376.98	57599.95	5.50	29547.70	1340.06	4.54
Mean	104737.69	5759.99	5.50	2954.77	134.00	4.54

Source : RBI, Trend & Progress Reports

Weaker section borrowers spread over the entire priority sector domain and they are in agricultural sector, SSI sector and other priority sector. Therefore the figures here are overlapping with those given under the components of priority sector advances. Thus the weaker section advances form part of each component of the priority sector advances. The above table indicates that Indian Bank has given much importance to weaker section advances and therefore the growth is by 7.5 times in 10 years. It was `845.27 crores in 2001–02 and it has risen to `6073 crores in 2010–11. Also in case of Public Sector Banks, the weaker section advances has been given more importance and hence it has grown 8.5 times in ten years. In case of Public Sector Banks, the highest annual growth in weaker section advances is seen in 2007-08 (`32649.92crores). In Indian Bank the highest annual growth is seen in the year 2009-10 (`1127 crores). Regarding NPA management, Indian Bank has taken enough care to see that the NPAs are controlled. Though the quantum of NPAs in Indian Bank fluctuate during the decade, the percentage of NPAs to the weaker section advances show a decreasing trend from 21.45 in 2001-02 to 0.17 in 2009-10 and it raised to 0.28 in 2010-11. Similarly in case of Public Sector Banks, the quantum of NPAs has shown ups and downs throughout the decade, but the percentage of NPA to weaker section advances shows a regular decline from 19.82 in 2001-02 to 2.38 in 2009-10 and it raised to 3.22 in 2010-11. If the percentage of NPA to weaker section advances in Indian Bank is compared to that of Public Sector Banks annually from 2001-02, the inference derived will be; NPAs in Indian Bank was higher than the industry average (industry average is that of Public Sector Banks as a whole) in 6 out of first 7 years of the decade i.e., from 2001-02 to 2007-08, except 2003-04. It is interesting to see a drastic reduction in the percentage of NPAs in Indian Bank during the last three years of the decade, of course, a slight increase is in 2010-11 over that of 2009-10. The mean for NPA percentage is almost same for both Indian Bank and Public Sector Banks. The NPA management in Indian Bank is better when compared to that of Public Sector Banks as a whole, because the net reduction in NPA percentage is more in Indian Bank (21.17) than the same in Public sector Banks as a whole (16.60). Also net reduction of NPAs in quantum is seen in Indian Bank, whereas, net increase in NPAs is seen in Public Sector Banks as a whole. From the year 2008-09, Indian Bank could control NPAs very effectively. The increase of NPAs in 2010-11 must be viewed seriously and Indian Bank must take appropriate steps to contain NPAs in the years to come.

X. Suggestions

1. Average percentage of Priority sector advances by Indian Bank is 37.84 of its total advances (statutory requirement is 40%). NPAs in Priority sector advances accounts to 58.71% of total NPAs of Indian Bank. Further, the mean percentage of gross NPAs to total advances in Indian Bank is 2.73. The mean percentage of NPAs in Priority sector advances to total Priority Sector advances is arrived at as 4.11. The incidence of NPAs is more in Priority sector advances. Therefore, Indian Bank has to restrict its advances to Priority Sector to the limit of 40% of total advances. Simultaneously, Indian Bank must take steps to improve recovery in Priority sector advances.
2. The average percentage of Agricultural advances in Indian Bank is 41.38 of its total Priority Sector advances (Statutory requirement is 18%). The average NPAs in Agricultural advances accounts for 23.03 percent of NPAs in total Priority sector advances. NPAs in Agricultural advances are 2.29

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percent of total agricultural advances. Indian Bank extends more credit to Agricultural. At the same time, the bank makes good recovery and thus NPAs are restricted. However, Indian Bank must take all efforts to prevent fresh NPAs in Agricultural advances.

3. Average lending by Indian Bank to SSI advances is 21.91 percent of the total Priority Sector advances. The mean percentage of NPAs in SSI advances to NPAs in total Priority Sector advances is 44.72. The mean percentage of NPAs in SSI advances to total SSI advances in Indian Bank is 8.38. The performance of Indian Bank is handling SSI advances is not comfortable. The NPAs in SSI advances contribute more to the NPA position of the bank as a whole. The NPAs in SSI sector is alarming. Indian Bank has to do an account wise analysis to identify initial sickness and prevent from becoming NPAs.
4. Mean of the Other Priority Sector advances for the decade of study is 36.11 percent of total Priority Sector advances in Indian Bank. The average percentage of NPAs in Other Priority Sector advances is 32.25 of the banks NPAs in total Priority Sector advances. The percentage of NPAs in Other Priority Sector advances to total Priority Sector advances. The percentage of NPAs in Other Priority Sector advances to total Other Priority Sector advances in Indian Bank is 3.61 percent, which is above the bank's average NPA position (2.73). Indian Bank has to take appropriate steps to improve recovery in Other Priority Sector advances. At most care must be taken to ensure prompt recovery without allowing any fresh NPAs.
5. About 25 percent of total Priority Sector lending by Indian Bank has gone to weaker sections. The average NPA level of weaker section advances to total weaker section advances in Indian Bank is arrived at as 4.54. The incidence of NPAs in weaker section advances is more in Indian Bank. Therefore, the bank must take steps to recovery and reduce NPAs. Efforts are necessary to prevent creation of fresh NPAs.

XI. Conclusion

The Priority sector advances have been analyzed in detail under three major heads, viz., Agriculture, Small Scale Industries and Other Priority Sector. Further weaker section advances, which forms part of Priority sector, have also been studied. The data related to Priority sector advances for 10 years have been collected for Indian Bank and for the Public Sector Banks as a whole. The data have been tabulated comfortably with required percentage calculation and mean calculations. Besides the loans and advances granted under priority sector, the NPA figures have also been tabulated both for Indian Bank and the Public Sector Banks as a whole. The data so provided helped to have an in-depth analysis about the participation of Indian Bank in lending activities to priority sector in comparison with that of the Public Sector Banks as a whole. The growth of Indian Bank's lending to Priority sector is more than that of the Public Sector Banks as a whole. In case of NPA management, the performance of Indian Bank is better than that of Public Sector Banks as a whole. However, Indian Bank has slippages during the period of study in controlling of NPAs in the early years of the decade. Indian Bank is still not comfortable in the area of NPA management. Therefore, the management of Indian Bank must pay special attention towards the NPA management and take appropriate steps to arrest the creation of new NPAs, besides making recoveries in the existing NPAs. Timely action is essential to ensure future growth of the Bank.

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A Comparative Study of Gujarat, Punjab and Himachal Pradesh in Reference to Selected Industries

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Abstract - Purpose: The GDP growth of the Indian subcontinent was continuous and rapid in last decade. The states play an important role in this. The current study evaluates the role of Gujarat, Punjab and Himachal Pradesh in this and further it compares the growth of these states. The study also finds the reason behind the disparity in the growth of industries in these states.

Methodology: The data of selected industries from 2005-06 to 2007-08 has been taken as sample for the purpose of study. The secondary data has been used for the present research. Descriptive statics is being used to check the normality and the average. The line graphs have been used to compare the growth rate of the states.

Findings: The findings reveal that the Gujarat is the most leading states among all three. There are several reasons behind this growth. The government policies, High per capita income, geographical advantage played an important role in the growth of the Gujarat, whereas Himachal is also showing the signs of growth after a slow down in the fiscal year of 2006-07. In the case of Punjab the government have to rethink about the policies.

Originality: The research compared the industrial growth of the three states: Gujarat, Punjab and Himachal Pradesh. The secondary data has been collected and used for the purpose of the study and study revealed the important facts behind the disparity among the growth rate of the states.

Keywords : GDP, government policies, gujarat, punjab, himachal pradesh.

GJMBR-A Classification : FOR Code: 140209

A COMPARATIVE STUDY OF GUJARAT, PUNJAB AND HIMACHAL PRADESH IN REFERENCE TO SELECTED INDUSTRIES

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I. Overview of the Study

With the globalization the GDP of the developing countries grows rapidly. India is among those few countries whose growth touched new heights and remained constant for several years. Figure 1 shows the data of Indian GDP.

Figure 1 : Annual GDP of India

Source : Indian Statistical Department

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The Indian states also played an important role in this growth. Delhi, Punjab, Gujarat, Bombay, Himachal Pradesh are amongst those states who contributes significantly in this growth. As far as economic growth is concerned, the developmental capacities of the Indian state are middling, some where between the more efficacious East Asian states on the one hand and the poorly performing sub-Saharan African states on the other hand (Kohli, 2004). It shows that the states play a vital role in the growth of India's GDP growth. Figure 2 shows the growth rate of Indian states, Punjab, HP and Gujarat.

It shows that there is disparity in the contribution of the states in the overall growth of the economic country. This disparity got impacted by a lot of factors such as geographical condition, labor, State government policy etc. The current study will investigate the growth comparison of the Punjab, Gujarat and Himachal Pradesh and attempts to find out the variations and the reason behind these variations. The study selects few selected industries for the purpose of research. These Industries include Food & Beverages, Chemical, Apparel and Textile industry.

The study is divided into six parts. The first part shows the overview of the study. The second part depicts the objectives of the study. The third part finds the review literature and find out the gap in the literature. The forth part reveals the methodology used for the purpose of the study. The fifth part discusses the findings of the study and the last part shows the conclusion of the study.

II. Objectives of the Study

- To compare the growth rate of the Punjab, Gujarat and Himachal Pradesh in reference to selected industries.
- To find out the reason of variations in the growth rate of the states.
- To suggest the possible ways for Punjab to accelerate the growth rate for the all the states in future.

III. Review of Literature

A number of researchers study the growth pattern of the India. *Bajpai et al. (2004)* measure the

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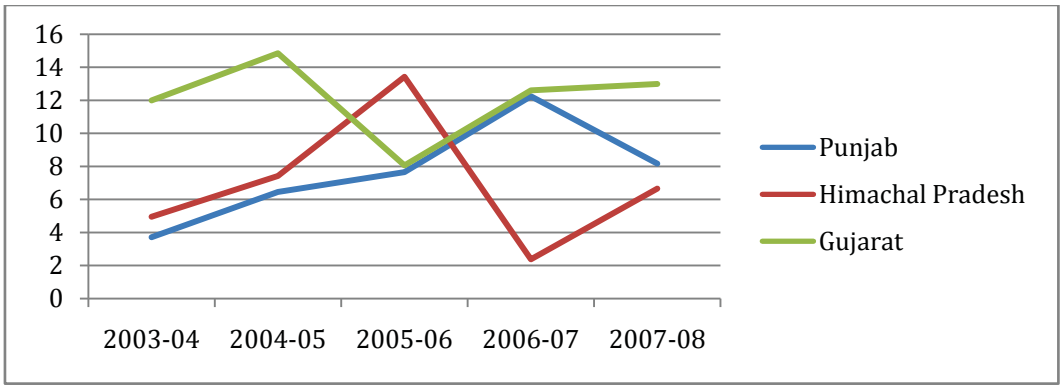
Figure 2 : State Wise Growth Rate (%) Gross State Domestic Product.



investment climate prevalent in 1996 and 2001 in 28 states of India. The study reveals that there is a high degree of heterogeneity across the states of India. However there is a pattern that emerges. Further the study find that the western states of India perform much better in 2001 than the eastern states. Assam, Bihar, and Orissa constitute the worse off states, thereby making the east west divide highly conspicuous. Maharashtra and Punjab do not show much improvement but remain on top with regards to investment attractiveness. West Bengal, though improved in investment climate in the view of a business-oriented person, has shown no improvement with respect to investment attractiveness. Uttaranchal depicts an improvement in all sectors. Assam does not rank high but at the same time shows a large improvement in all sectors.

PHD Chamber (2011) performed the economic analysis of the Indian states. The study concludes that since majority of the population in the northern and central states depends on agriculture; these states must work towards improving the yield or productivity of farm sector so as to ensure the sustained livelihood of the people. The region must focus on increased farm infrastructure and stronger supply chain so as to facilitate the growth of the agriculture and allied sectors. The states must lay emphasis on attracting private and foreign investment in manufacturing sector in particular and industries in general to lay the solid foundation to the growth of the country.

Chakravarti and College (2008) investigate the critical factors which drive investment inflows across Indian states. The empirical findings predict that political stability and fiscal reforms are the two most important factors determining investment inflows across states. Using a disaggregated analysis, the study predicts that states successful in maintaining political and fiscal stability stand to gain most from public investments in human capital formation in terms of increased investment inflows. The study concludes that investors select states as investment destinations predominantly on the basis of their contemporary socio economic performance as opposed to their past images as investment destinations.

Dollar, Iarossi and Mengistae (2002) also expect a good investment climate to facilitate a higher volume of investment inflows, especially in the high productivity manufacturing and services sectors, leading to job creation, income growth and, ultimately, poverty reduction.

Ferro, Rosenblatt and Stern (2004) identify a good investment climate to be a key factor driving agricultural productivity and non-farm growth, especially through small-scale and medium-scale enterprises. The above-mentioned authors recognize an investment climate conducive to growth acceleration to be one of the pillars of poverty alleviation.

Veeramani and Goldar (2004) discuss the effects of investment climate on total factor productivity in the manufacturing sector. Both these studies select a number of variables which together constitute the investment climate of a state and test their effect on total factor productivity using firm level data.

Though the scholars investigated the Indian states and the investment climate in these states, not many studies have been concentrated on the north Indian states Punjab and Himachal. The present studies evaluate the investment climate and industrial scenario of Punjab Himachal Pradesh and Gujarat and compare the investment in these states with reference to selected industries.

IV. Research Methodology

The present study evaluates the growth rate of the Punjab, Gujarat and Himachal Pradesh in reference to selected industries. The study also evaluates the reason behind the variation is the growth rate. The study uses the data of the four industries (Food & Beverages, Apparel, Chemical and Textile). The data from 2006 to 2010 has been used for the purpose of study. The study used secondary data for the purpose of the study.

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Following tools are used for data analysis.

The *mean* is a particularly informative measure of the "central tendency" of the variable if it is reported along with its confidence intervals.

$$\text{Mean} = \frac{\sum X_i}{n}$$

Usually we are interested in statistics (such as the mean) from our sample only to the extent to which they can infer information about the population. The confidence intervals for the mean give us a range of values around the mean where we expect the "true" (population) mean is located (with a given level of certainty).

$$s = \sqrt{\frac{\sum (x_i - \mu)^2}{N}}$$

Where

μ is the population mean and N is the population size

$s = [S (x_i\text{-}m)^2/N]^{1/2}$

The sample estimate of the population *standard deviation* is computed as:

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{(n-1)}}$$

Where

of $\bar{x}$ is the sample mean and n is the sample size

The *variance* of a population of values is the square of standard deviation.

Skewness measures the deviation of the distribution from symmetry. If the skewness is clearly different from 0, then that distribution is asymmetrical, while normal distributions are perfectly symmetrical.

$$\text{Skewness} = \frac{1}{n-1} \frac{\sum_{i=1}^{n} (x_i - \bar{x})^3}{s^3}$$

Where

n = number of data points

s = standard deviation

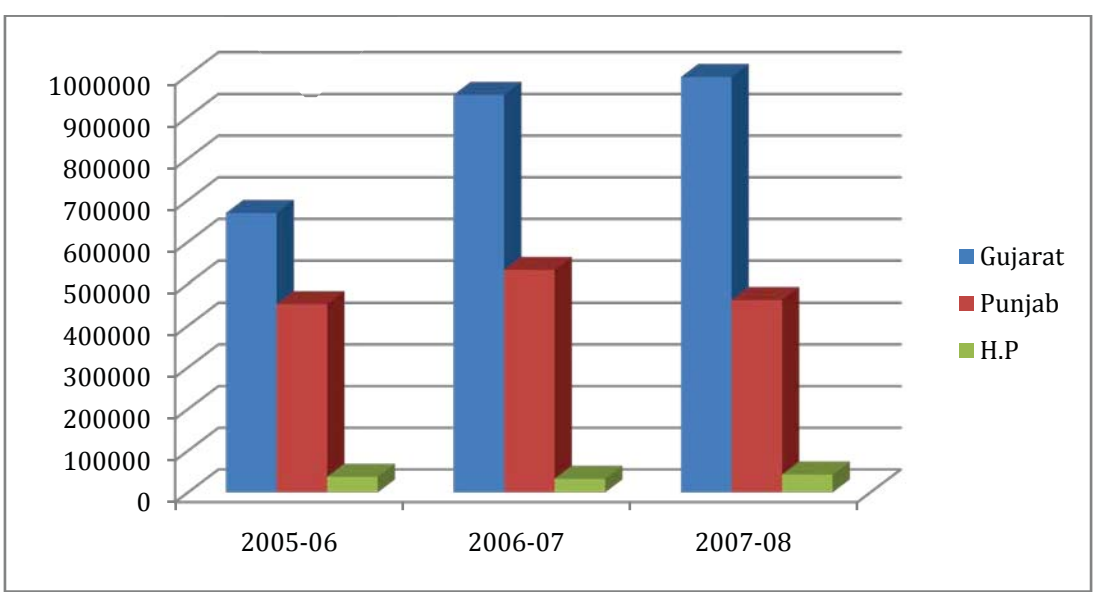
$\bar{x}$ = mean return

Further, the growth pattern of all the three states has been compared with the help of charts.

V. Findings and Analysis

This part of the study shows the findings and analysis of the study. The study selected the data of the four major industries i.e., Food Products and Beverages Industries, Textiles industry; Wearing Apparel, Dressing Industry and Chemical and Chemical manufacturing industry to compare the growth rate of the Gujarat, Punjab and Himachal Pradesh. The comparison of Food and Beverages industries is shown below with the help of Figure 3 followed by the descriptive statistics in table 1. It can be observed by the image and table that Gujarat is the only one industry among all three whose growth rate is consistent for all the years.

Figure 3 : Comparison (Investment) 2005-06 to 2006-08 in INR LakhsMfr. of Food Products and Beverages



Descriptive Statics for investment in Food Product and Beverages 2005-06 to 07-08

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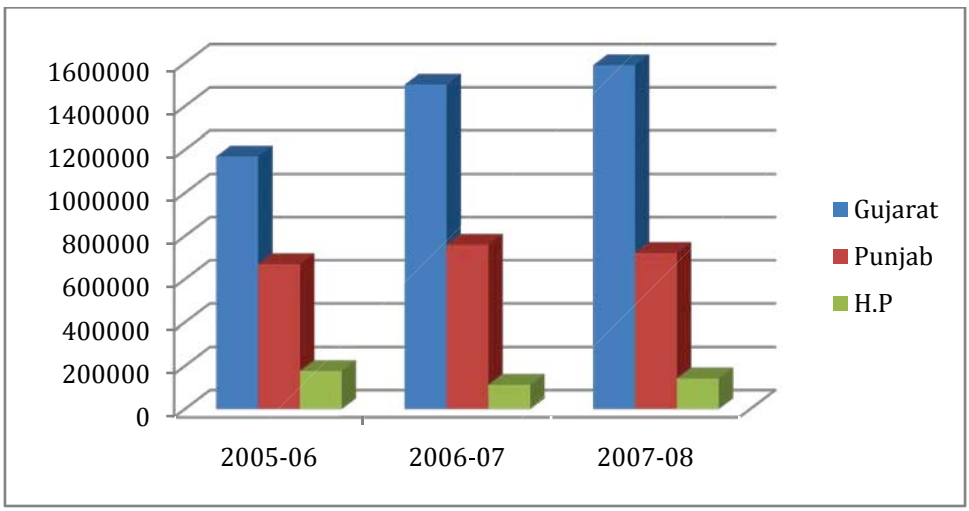
Table 1

	Gujarat	Punjab	H.P
Mean	872328.7	481755.333	37394.67
Standard Error	102386.7	25403.8264	2910.047
Median	952550	461442	37237
Standard Deviation	177338.9	44000.7181	5040.35
Sample Variance	3.14E+10	1936063194	25405126
Skewness	-1.61907	1.6346975	0.140626
Range	326328	80662	10077

Further figure 4 shows the comparison of investment in textile industries. It can be visible that the Gujarat is the major states where companies have invested the capital. In the case of Himachal the growth is stagnant and in the case of Punjab the growth is declining. Table 2 supports these finings. The mean value of the Gujarat 1419783, Punjab 716856 and H.P, 143725, shows that the investment is Gujarat is far more than the Punjab and Himachal Pradesh.

Figure 4 : Comparison (Investment) 2005-06 to 2006-08in INR Lakhs Mfr. of Textiles



Descriptive Statics for investment in textiles 2005-06 to 07-08

Table 2

	Gujarat	Punjab	H.P
Mean	1419783	716856	143725
Standard Error	127912.6	26081.31408	18591.31
Median	1500025	721432	142145
Standard Deviation	221551.1	45174.16111	32201.09
Sample Variance	4.91E+10	2040704832	1.04E+09
Skewness	-1.41603	-0.451158449	0.220268
Range	420741	90000	64344

Table 3 shows the descriptive statistics for the investment in apparel industry. The same trend can be observed in this case also. The mean value in the table shows that the investment in Gujarat is far more than the Punjab and Himachal Pradesh and the trend is also upwards. The standard deviation also shows the same. Figure 5 also shows the same where the bar of Gujarat is growing at a rapid speed and it's very high in the comparison to Punjab and Himachal Pradesh.

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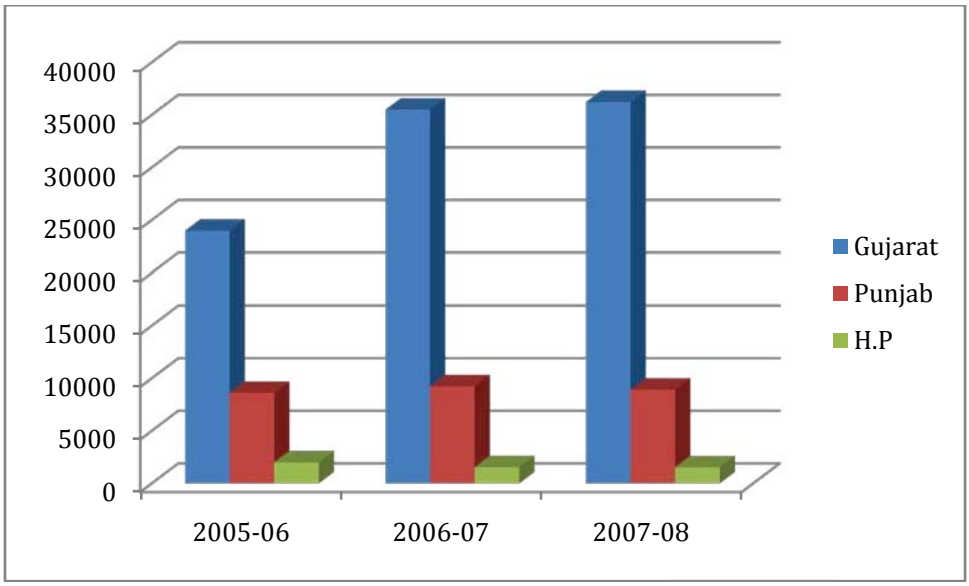
Figure 5 : Comparison (Investment) 2005 -06 to 2006-08 in "Mfr. of Wearing Apparel, Dressing & Dyeing of Fur"



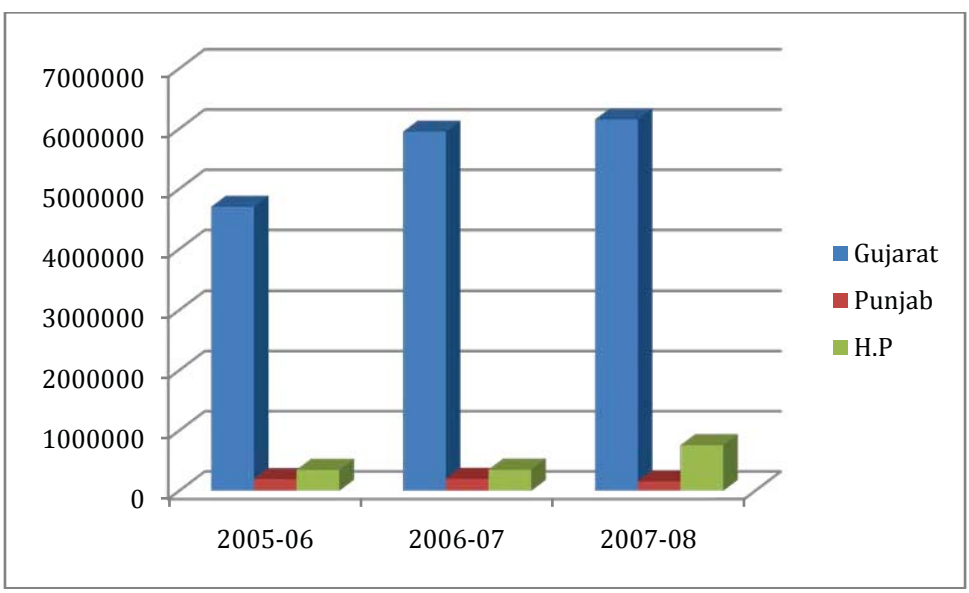
Descriptive Statics for Investment in Wearing Apparel, Dressing & Dyeing of Fur 2005-06 to 07-08

Table 3

	Gujarat	Punjab	H.P
Mean	31907.33	8921.667	1690.667
Standard Error	3965.847	177.8767	154.7055
Median	35500	8913	1542
Standard Deviation	6869.048	308.0914	267.9577
Sample Variance	47183816	94920.33	71801.33
Skewness	-1.70977	0.126486	1.728144
Range	12248	616	470

Figure 6 also supports the same trend as the last tables showed. In the case of chemical industry Gujarat is the most favorable state for the investment in the chemical manufacturing industry. Himachal Pradesh is also growing slowly but rapidly. In the case of Punjab the growth is very low and declining. Table 6 also validates the same findings.

Figure 6 : Comparison (Investment) 2005-06 to 2006-08 in Mfr. of Chemical and Chemical Products



Descriptive Statics for Investment in Chemicals and Chemical Products 2005-06 to 07-08

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Table 4

	Gujarat	Punjab	H.P
Mean	5603796	182239.7	484021.7
Standard Error	453739.7	13893.26	135809.2
Median	5952134	193920	350034
Standard Deviation	785900.3	24063.83	235228.5
Sample Variance	6.18E+11	5.79E+08	5.53E+10
Skewness	-1.60271	-1.66964	1.731586
Range	1451392	43669	409233

After evaluating the charts shown above as well as the descriptive statistics for all the industries, its visible that the growth rate of Gujarat is far more than the Punjab and Himachal Pradesh. Himachal Pradesh is also growing in chemical manufacturing industry. But in the case of Punjab it's shown that the growth is stagnant or declining in all the industries. There are a number of reasons behind this. The study further evaluated the reasons behind these.

Firstly the study evaluated the reason behind the growth of Gujarat and the following reason came.

Reasons behind the Development of Gujarat

Geographical Advantage – Gujarat have the geographical advantage of the port. Gujarat is the only state among all three who have ports. Because of it Gujarat has been connected with the globe. Kacch region of Gujarat is a most attractive place for the companies because of the port. The international trade becomes very easy for the companies from this place.

One of the highest per capita income state in India – The Gujarati consumers are quick adopters and move fast to stay ahead of the latest technologies. Companies in Gujarat look carefully to consumer demands when developing new products.

World-class companies and SMEs with unique strengths - Gujarat's strong technology based industries offer a multitude of opportunities for foreign companies looking to partner with Gujarat based entrepreneurs at all stages.

Loyalty and commitment to long-term partnerships - Foreign companies have long found their partnerships with Gujarat based companies to be ones based on loyalty and commitment. Such relationships provide the ever-essential stability in the long-term while offering cost reduction and improved quality.

Gujarat is a thriving center for Pharmaceutical innovation and product development.

Partnerships with Gujarat based companies enable foreign companies to leverage their respective talents to remain globally competitive.

Favorable business environment through Special Investment Regions . Gujarat's attractiveness as an investment destination is ever increasing, as the government works to improve its business friendly environment with not only Special Economic Zones but large Investment Regions with robust infrastructure.

Apart from the above points the government of Gujarat provides a stable political environment in the state. BJP is ruling Gujarat from last 1.5 decades which gives the companies an assurance of risk free business in long term because the business policies doesn't changed after every five years.

Himachal Pradesh is also growing slowly but at a consistent speed.

The reason for the development of Himachal Pradesh is:

Subsidy : The government provides the land at the subsidized rates to the company. This attracts the pharmaceutical manufacturing companies towards Himachal Pradesh because the industry needs the cheap land.

Infrastructure : The government developed the suitable infrastructure in the states i.e., Baddi. This gives the assurance to the companies that the state will work for there well being.

Human Resource : As per the Himachal is a hilly state, the people are hard worker and they seek for the jobs. In this way the industry got the cheap labor.

Apart from these government provides the electricity and other supplies uninterruptedly to the industry. This motivates the investors to look towards Himachal as a suitable option for the investment.

The Condition of Punjab:

When we compare the Punjab in terms of these factors the condition seems to unfavorable for the investors. The industries running in the Punjab from so long is also suffering from the ignorance of the government as well as from the lack of the human resources. The people from Bihar were the major source for human resource in Punjab. But after the schemes like MANREGA and the industrial development in Punjab these migrants started shifting towards there own states. Following are the major problems of the Punjab:-

Ignorance of Industry development : As per the Punjab is famous as an agricultural state, government focus mainly on the farming. All the subsidies in electricity or taxes have been given to farmers and the burden of the taxes has been shifted towards the industries.

High cost of Land : The cost of land is very high in Punjab. If we compare the cost of land which is a major concern for the companies while selecting a particular state for investment, we will find that the Punjab is the most costly state for the investment. The average cost of per acre land in Punjab is approximate 10 Million (2crores), whereas in Himachal Pradesh it's 4-5 Million and in Gujarat the rate is 5 Million per acre.

High cost of Electricity : The case is same in the case of electricity. The cost of electricity per unit in

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High cost of Electricity : The case is same in the case of electricity. The cost of electricity per unit in Punjab is INR 5.25, whereas in Himachal the rate is 3.01 and in Gujarat it's INR 3.65.

Apart from this the policies of Punjab government are agriculture centered. All the subsidies are given to the agriculture sector but the industrial sector is ignored. The land is so costly in the Punjab region. The raw material cost is very high in Punjab because the Punjab is dependent on the other states for the raw material.

VI. Conclusion

Out of the three states Gujarat is growing at a rapid speed and it's observed that it continue to grow in the near future. The companies are interested in investing in the Gujarat because apart from the geographical advantage the government policies are also favorable for the companies. The government is providing subsidies, special economies zones, and suitable business environment. The customer of Gujarat is also quick adoptive which provide the companies an efficient market. In the case of Himachal Pradesh, The growth is slow but consistent. The pharmaceutical industry is growing in Baddi and nearby areas. The government is providing the support by improving the infrastructure as well as giving the companies subsidies. In the case of Punjab the scenario is a bit reverse. The growth is stagnant and declining for some industries. The growth in textile industry is stagnant because of the labor, electricity and other government policies. The food and beverages industry is also suffering from a decline as per the major companies Verka, Milkfed etc are suffering from losses. There is a need for government to rethink on the issue and to restructure the policies of the government so that the industries of Punjab can be recovered from the downturn. The Punjab government has to subsidize the raw material rates as well as the rates of the electricity in terms to attract the Industries. The government also has to provide the subsidized land to the industrialist. The Punjab is also ignored from the center side. None of the central schemes have been started in the Punjab where the Himachal have a number of center sponsored schemes.

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Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications

Research letters: The letters are small and concise comments on previously published matters.

5.STRUCTURE AND FORMAT OF MANUSCRIPT

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

Papers: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and to make suggestions to improve briefness.

It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

Format

Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

Structure

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

Abstract, used in Original Papers and Reviews:

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.

Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution (at final image size) ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs) : >350 dpi; figures containing both halftone and line images: >650 dpi.

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Figure Legends: Self-explanatory legends of all figures should be incorporated separately under the heading 'Legends to Figures'. In the full-text online edition of the journal, figure legends may possibly be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should notify the reader, about the key aspects of the figure.

6. AFTER ACCEPTANCE

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

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The corresponding author will receive an e-mail alert containing a link to a website or will be attached. A working e-mail address must therefore be provided for the related author.

Acrobat Reader will be required in order to read this file. This software can be downloaded

(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

Proofs must be returned to the dean at dean@globaljournals.org within three days of receipt.

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Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

4. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

5. Ask your Guides: If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

8. Use the Internet for help: An excellent start for your paper can be by using the Google. It is an excellent search engine, where you can have your doubts resolved. You may also read some answers for the frequent question how to write my research paper or find model research paper. From the internet library you can download books. If you have all required books make important reading selecting and analyzing the specified information. Then put together research paper sketch out.

9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

10. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

11. Revise what you wrote: When you write anything, always read it, summarize it and then finalize it.

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

13. Have backups: When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

14. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

15. Use of direct quotes: When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

17. Never use online paper: If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

18. **Pick a good study spot:** To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. **Think technically:** Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
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