

## EFFECTS OF INSURANCE FUNCTION IN SUPPLY CHAIN RISK MANAGEMENT IN KENYA: A CASE OF KENYA REINSURANCE

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### ABSTRACT

The increasing trend to source globally with a rise in disruptive natural catastrophes, has led to growth in business interruption and contingent business interruption. Manufacturers are increasingly being caught out by the closure of critical suppliers, a trend which has become both insurers and businesses concerned. The main thrust of this research paper is therefore to describe the effects of insurance function in managing supply chain risks in different organizations in Kenya conducted through a case study descriptive design, case study of Kenya Reinsurance Corporation Limited. The researcher will examine a sample of staff drawn from the population of 100 staff working at Kenya Reinsurance Corporation in Kenya and a sample of 30 respondents will be chosen from the total population using stratified random sampling technique. Data will be collected using a self-administered questionnaire and will be analyzed by the use of statistical packages for social science (SPSS) and Microsoft excel statistical tools. In trying to explain the relationship between different variables in the study, linear regression relationship curves will be developed to show the relationship between the independent and dependent variables. Finally a recommendation will be drawn based on the findings and the type of relationship between the different variables within the study with reference to the dependent variable, supply chain risk management.

**Key Words:** *insurance function, supply chain risk management, Kenya reinsurance*

### Introduction

In the current global downturn, businesses are being hit by falling demand and unpredictable global supply costs which will expose these and other built in supply chain vulnerabilities. The key questions are, do business leaders understand these vulnerabilities and does their supply chain team have the capability to identify them and present the plans to mitigate them? In most cases the answer is no. In tough times businesses need to focus absolutely on profit, cash flow and eliminating unpredictable events from a declining demand profile (Chopra & Sodhi, 2004).

Businesses processes today are an endangered species due to the increased vulnerabilities as a result of risks along the process of enhancing performance in the organization. Risk is defined as the probability of variance in an expected outcome and it differs from uncertainty in that risk has associated with it a probability of a loss and uncertainty is an exogenous disturbance (Spekman and Davis, 2004). According to Normann and Jansson (2004) “risk is the chance, in quantitative terms, of a defined hazard occurring. It therefore combines a probabilistic measure of the occurrence of the primary event(s) with a measure of the consequences of that/those event(s)”. So to manage risk both an assessment of the probability of risk and its impact is necessary (Hallikas et al., 2002; Zsidisin et al., 2004; Hallikas et al., 2004). As companies increasingly move towards inter-firm co-operation to achieve sustained competitive advantage, research in risk management began to examine risk management at the level of inter-organizational relationships and more recently at the level of supply chains and networks (Harland et al., 2003). Risk is perceived to exist when there is a relatively high likelihood that a detrimental event can occur and that event has a significant associated impact or cost (Zsidisin et al., 2004). A key feature of supply chain risk is that, the complexity makes it difficult for the exposed company to estimate the total financial losses, which contributes to the impediment in how to design risk mitigation solutions for supply chains. Current business trends that increase the vulnerability to risks in supply chains are (Harland et al., 2003; Normann and Jansson, 2004; Christopher and Lee, 2004; Cucchiella and Gastaldi, 2006): increased use of outsourcing of manufacturing and R&D to suppliers, globalization of supply chains, reduction of supplier base, more intertwined and integrated processes between companies, reduced buffers, shorter lead times requirements, shorter product life cycles and compressed time-to-market, increased product/service complexity and Capacity limitation of key components

According to Standard Chartered Bank World of Supply Chain Management 2007/2008, insurance is widely acknowledged as a key component in an organization's disaster preparedness and resilience. With growing trade volumes, vessel sizes and government legislation, supply chain managers face increasing risks and liabilities in their industry. Insurance is an important risk management tool, but one that has yet to be fully utilized in Kenya. For an effective insurance purchasing strategy, supply chain managers should be aware of the changing risk exposures, the breadth of cover available and the long-term benefits that insurance provides by protecting performance trend and hence profitability (Spekman & Davis, 2004). Supply chain management, by the diverse nature of the business, is exposed to constantly changing and, in most cases, increasing risks and liabilities. Depending upon the geographical spread of the business, those risks are likely to range from political risks to business interruption and the more specific threats of piracy or theft (WB, 2008).

### **Statement of the problem**

According to a World Economic Forum report 2012, supply chains have become longer and more complex, while the severity and frequency of supply chain disruptions seems to be increasing. Significant supply chain disruptions reduce the share price of affected companies by as much as 7% on average (WEF, 2012). According to World Bank, 80% of companies worldwide see better protection of supply chains as a priority and gives more emphasis on risk sharing through insurance (WB, 2012). A study by Zurich Global Corporate North America done in conjunction with the Business Continuity Institute, found that 70% of the companies undergone some kind of business risk disruption. The data indicates that 40% of companies that experience a supply chain risk disruption of more than a year don't recover (ZGC, 2010).

The effect of insurance in Kenya has gone beyond ignorable level with the rising cases of risky disruptions involving major supply chain firms and companies. According to a Standard report dated 19<sup>th</sup> January, 2013, destruction of the Kenya Medical Supplies Agency (KEMSA) drugs worth of millions shillings by fire in Nairobi, disrupted the drug distribution chains in the entire country. Further on 12<sup>th</sup> September 2011, a pipeline explosion that destroyed fuel, affected the entire pipeline oil supply chain in Kenya; insurance has played a significant role in resuscitating the companies back and the effect is far reaching (Standard Daily, dated 12<sup>th</sup> September, 2011).

According to World Bank More than 80% of organizations indicate that supply chain risk management has become a greater priority in their organization over the last five years and 80% of companies worldwide see better protection of supply chains as a priority (WEF, 2012). Literature reviews in this study shows that adequate supply chain risk management contributes to gross domestic product (GDP) by more than 70% yet there is little or no empirical evidence available to this study on the effect of insurance function in supply chain risk management (El-Kot and Lean 2008). This study therefore seeks to fill this gap.

### **Main objective**

To determine the role of insurance function in supply chain risk management in Kenya

### **Specific objectives**

1. To determine how business continuity management in insurance helps in supply chain risk management in Kenya
2. To investigate whether information dissemination and sharing in insurance affects supply chain risk management in Kenya
3. To identify whether insurance policies and regulations affects supply chain risk management in Kenya
4. To understand the level in which cost of products in insurance affects supply chain risk management in Kenya

### Theoretical Review

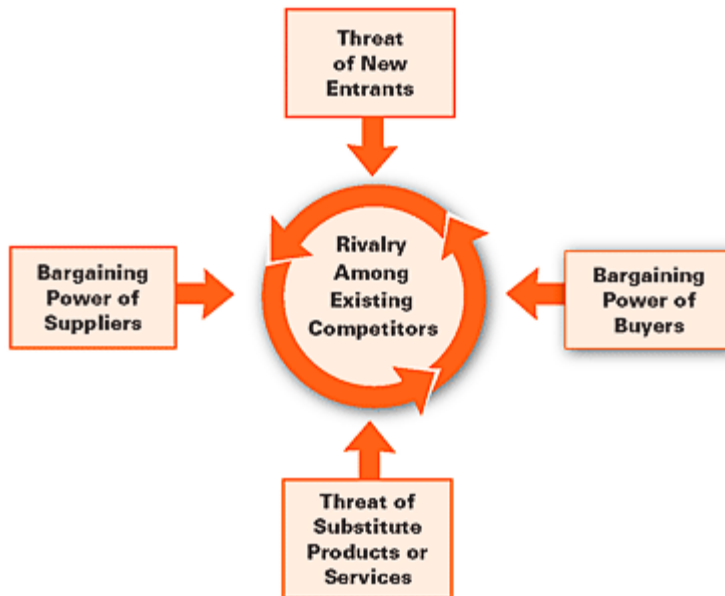
According to Easton (2003), theories can be classified according to their scope, function, structure and level. Several theories have been put forward by scholars to explain the field of supply chain. However these theories have their roots in insurance risk management, supply chain, economic, information technology and social perspective (Kwabena, 2011). The relationship depicted by these theories is therefore reflected in this section of literature concerning the role of insurance function in supply chain risk management.

### Michael Porters' Five Competitive Forces Model

The model of pure competition implies that risk-adjusted rates of return should be constant across firms and industries. However, numerous economic studies have affirmed that different industries can sustain different levels of profitability; part of this difference is explained by industry structure. Michael Porter provided a framework that models an industry as being influenced by five forces. The strategic business manager seeking to develop an edge over rival firms can use this model to better understand the industry context in which the firm operates. It draws upon industrial organization economics to derive five forces that determine the competitive intensity and therefore attractiveness of a market. Attractiveness in this context refers to the overall industry profitability (Porter, 2002). An "unattractive" industry is one in which the combination of these five forces acts to drive down overall profitability. A very unattractive industry would be one approaching "pure competition", in which available profits for all firms are driven to normal profit. Three of Porter's five forces refer to competition from external sources. The other two represents internal threats (Porter, 2008).

Porter referred to these forces as the micro environment, to contrast it with the more general term macro environment. They consist of those forces close to a company that affect its ability to serve its customers and make a profit. A change in any of the forces normally requires a business unit to re-assess the marketplace given the overall change in industry information. The overall industry attractiveness does not imply that every firm in the industry will return the same profitability. Firms are able to apply their core competencies, business model or network to achieve a profit above the industry average. A clear example of this is the airline industry. As an industry, profitability is low and yet individual companies, by applying unique business models, have been able to make a return in excess of the industry average. Porter's five forces include - three forces from 'horizontal' competition: the threat of substitute products or services, the threat of established rivals, and the threat of new entrants; and two forces from 'vertical' competition: the bargaining power of suppliers and the bargaining power of customers (Porter, 2008).

## The Five Forces That Shape Industry Competition



**Figure 2.1: Porter's Competitive forces**

*Source:* Michael E. Porter "The Five Competitive Forces that Shape Strategy", 2008.

### Pareto's theory

In the 19th century, Vilfredo Pareto (1906) identified a form of segmentation with his 80/20 rule. He discovered that 80% of the wealth of a country would be held by 20% of the people. Pareto's theory can be applied equally well to most things in the business world, whether this be spend by supplier, items in inventory, contribution of ideas or supplier defects. Armed with the knowledge that just 20% of our suppliers account for 80% of our spend it becomes very easy to see how we should allocate our time in terms of supplier management. This theory is also sometimes referred to as the 80/20 principle and / or 'the vital few and the trivial many (Joseph Juran, 1940).

The value of the Pareto Principle for a manager is that it reminds you to focus on the 20 percent that matters. Of the things you do during your day, only 20 percent really matter. Those 20 percent produce 80 percent of your results. According to Pareto's theory organizations identify and focus on those vital things because when the 'fire drills' the day begins to sap your time, and management should always remember the 20 percent they need to focus on. Therefore if something in the schedule has to slip, if something isn't going to get done, management need to make sure it's not part of that 20 percent (Reh, 2012).

Many management theories propose to interpret Pareto's Principle in such a way as to produce what is called Superstar Management and claim that since 20 percent of an organizations' employees produce 80 percent of its results, organizations should focus its limited time on managing only that 20 percent. However the theory is flawed, because it overlooks the fact that 80 percent of an organization's time should be spent doing what is really important. Helping the

good become better is a better use of own time than helping the great becomes terrific (Reh, 2012).

### **The supply chain operations reference model (SCOR, 2000)**

The Supply-Chain Council's Supply Chain Operations Reference (SCOR) model is a method of benchmarking and measuring improvements in supply chain performance. The Supply-Chain Council was formed in 1996-1997 as a grassroots initiative by individuals representing companies. The SCOR, now in its fifth version, is a cross-industry reference model that contains standard process definitions, standard terminology, standard metrics, supply-chain best practices, and enabling information technology. The SCOR model defines common supply chain management process, and matches them against "best practices". The model was designed to enable companies to communicate, compare and learn from competitors and companies both within and outside of their industry.

SCOR includes all customer interactions from order entry through paid invoice, all product transactions (whether physical or service) and all market interactions from understanding demand fulfilling it at each individual order level. The SCOR model takes the different SC flows into account in a common manner. Indeed, the set of categories of processes and sub-processes is able to represent the different types of manufacturing organization. So, it is easier for the decision-makers to consider the whole SC, which is a necessary condition for the management to consider the consequences of their decision (Berrah & Clivillé, 2007).

The SCOR model is a process reference model rather than a functional reference model. Thus, it opens out to analysis those processes that involve cross-functional activity – for instance, the Plan process would involve sales & marketing, manufacturing, finance, and logistics among others. It can effectively draw attention to the gaps in the process rather pointing to specific departmental functioning. This in turn can help the company in communicating clearly, without ambiguity and help in measuring, managing, and refining particular process elements. It helps companies capture the "as-is" state of a process with the objective to achieve the desired "to-be" future state. It also allows the organization to quantify the operational performance, and set improvement targets based on best practices in similar companies.

### **Theory of corporate social responsibility**

'Corporate Social Responsibility' (CSR) refers to a form of corporate self-regulation integrated into a business model, which usually involves active compliance with the law, ethical standards, and international norms. This theory aims to achieve positive impacts on the environment, consumers, employees, and the communities. Under the force of globalization, this theory has been challenged by the diminishing different roles of the government and firms, especially when the power of multinational companies is rising (Sen & Bhattacharya, 2001).

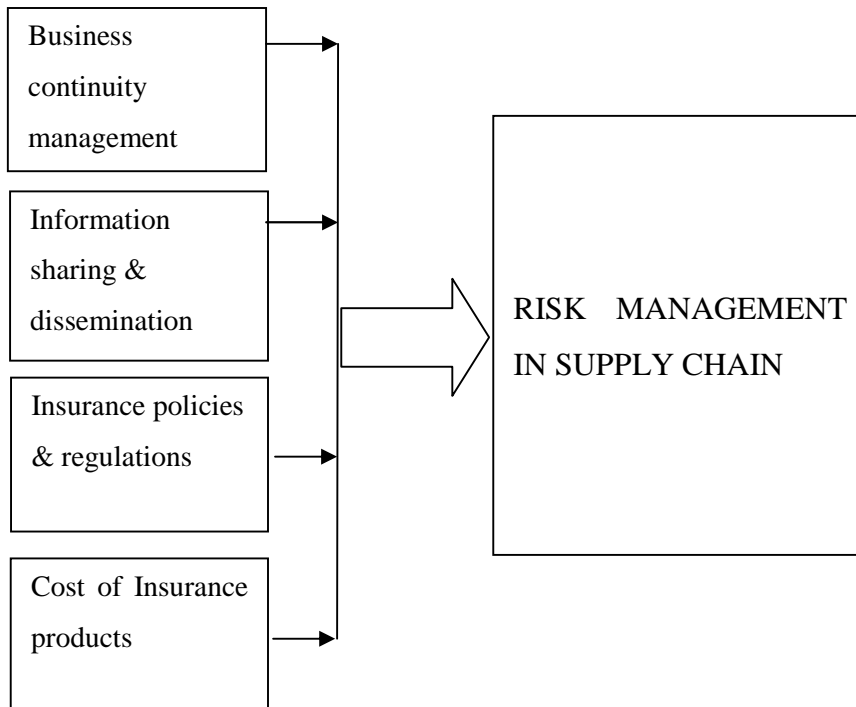
Carroll (1979) differentiated between four types of corporate social responsibilities: economic, legal, ethical, and discretionary. He also presented the argument that firms wishing to effectively engage in CSP needed to have a basic definition of CSR, an understanding of the issues for which a social responsibility existed and a specification of the philosophy of responsiveness to the issues. A basic starting point for effective CSP from this perspective is the assimilation and adoption of the basic types of CSR. The first category that Carroll (1979) delineated is a responsibility that is economic in nature, entailing for example providing a return on investment to owners and shareholders; creating jobs and fair pay for workers; discovering new resources; promoting technological advancement, innovation, and the creation of new products and services. Business from this perspective is the basic economic unit in society and all its other roles are predicated on this fundamental assumption (Carroll, 1979). It also entails expectations of legal compliance and playing by the “rules of the game.” From this perspective, society expects business to fulfill its economic mission within the frame work of legal requirements. But while regulations may successfully coerce firms to respond to an issue, it is difficult to ensure that they are applied equitably (Pratima, 2002). Moreover, regulations are re-active in nature, leaving little opportunity for firms to be proactive. In essence, ethical responsibility overcomes the limitation of law by creating an ethics ethos that companies can live by (Solomon, 1994). It portrays business as being moral, and doing what is right, just, and fair. Therefore, ethical responsibility encompasses activities that are not necessarily codified into law, but nevertheless are expected of business by societal members such as respecting people, avoiding social harm, and preventing social injury. Such responsibility is mainly rooted in religious convictions, humane principles, and human rights commitments (Lantos, 2001).

The final type of responsibility is where firms have the widest scope of discretionary judgment and choice, in terms of deciding on specific activities or philanthropic contributions that are aimed at giving back to society. The roots of this type of responsibility lie in the belief that business and society are intertwined in an organic way (Frederick, 1994). This type of responsibility is the most controversial of all since its limits are broad and its implications could conflict with the economic and profit-making orientation of business.

## Conceptual Framework

*Independent variables*

*Dependent variable*



**Figure 2.2: Conceptual framework**

## Conceptualization of variables

### Business continuity management

Business continuity management (BCM) is the development of strategies, plans and actions which provide protection or alternative modes of operation for those activities or business processes which, if they were to be interrupted, might otherwise bring about a seriously damaging or potentially fatal loss to the enterprise” (Hiles and Barnes, 2001). Business continuity management includes crisis management (overall processes to manage the incident), disaster recovery (recovery of critical systems, applications, data and networks), business recovery (recovery of critical business processes) and contingency planning (recovery from impact external to the organization) (CMI, 2002).

Developing action plans is important in BCM, and business continuity planning (BCP) is a term often used. BCP is planning to ensure continued operations in case of a catastrophic event. But it goes beyond disaster-recovery planning, since it includes the actions to be taken, resources required, and procedures to be followed to ensure the continued availability of essential services,



programs and operations in the event of unexpected interruptions. BCP has previously been mostly related to computers and information technology-related disasters, especially before Y2K, but since then the approach has moved towards more applications in other business contexts. However, according to a study by CMI (2002), only about 30% of all companies studied developed BCP jointly with suppliers. Only 9% of companies that have outsourced activities (not only logistics) insist on their outsource suppliers having business continuity plans.

The first activities in developing business continuity plans are identifying the risks and assessing their probability and impact – the steps are hence identical to risk management. Part of this is to understand what will be affected (damage potential analysis). Then, strategies and recovery plans should be developed that could be implemented both before the incident (similar to risk management strategies) and after the incident. Post-incident strategies are implemented to maintain partial or total product supply and could for manufacturing and logistics include (Musson, 2001): use of spare capacity within the organization, shutdown of marginal product lines and transfer of key products to those production facilities, assistance from competition, outsourcing to sub-contractors, job shops, etc, re-labeling of competitors' products (after consideration of all legal implications) and Establishment of temporary facilities when production capabilities can be established with “off-the-shelf” or second-hand equipment.

### **Information dissemination and sharing**

Information sharing is vital for supply chains as lack of information lead to panic, chaotic behavior and unnecessary costs (Childerhouse et al., 2003). Contemporary models for SCM agree that the sharing of business information is a crucial element, which binds supply chains together from end-to-end (Zhenxin et al., 2001; Yu et al.,2001). Free exchanges of information which starts with the product development stage and continue with the mature and end-of-life phases of the product life cycle has been found to be highly effective in reducing the risks associated with inventories, obsolescence and supplier failure (Lee et al., 1997; Lee, 2002). Advent of internet and e-commerce had provided opportunities to all the participants of a supply chain to transfer the information in real time with least transaction cost and global reach (Zeng and Pathak, 2003) resulting in substantial reduction in coordination and distribution costs (Koh and Nam, 2005).

### **Cost of Insurance product**

Insurance is rapidly becoming more of a commodity, with customers often choosing their insurer purely on the basis of price. As a result, accurate ratemaking has become more important than ever. A Towers Perrin survey found that 96 percent of insurers consider sophisticated rating and pricing to be either essential or very important (Kelly, 2004). Multiple factors go into determining premium rates, and as competition increases, insurers are introducing new, innovative rate structures. Although there are many obvious risk factors that affect rates, subtle and non-intuitive relationships can exist among variables that are difficult, if not impossible, to identify without applying more sophisticated analyses (Bunni, 2003).

## **Product Liability Insurance**

Product liability insurance protects companies against lawsuits from product-related injuries or accidents. The types of accidents product liability insurance policies protect against are usually those stemming from the use or handling of products or goods manufactured, sold or distributed by the named insured. Product liability insurance generally covers personal injuries, not property damage. While some general insurance policies cover product liability, product liability insurance policies usually limit coverage to occurrences that took place when the policy was in effect. Nevertheless, many product liability accidents do not occur until sometime after the product in question was made, sold, or marketed (Kelly, 2004; Wright, 2005).

### **Cost of Insurance**

The potential for large jury verdicts against the manufacturers, distributors and marketers of unsafe products, product liability insurance has become very costly. It is estimated that product liability insurance costs 26 cents for each \$100 of retail cost. If a product has the potential to cause bodily harm, the premiums for product liability insurance are even higher. Some small businesses are unable to afford the premiums to insure their products against product liability claims. What's more, some distributors or sellers of products require the manufacturer to have product liability insurance before they will agree to distribute or sell the product (Bunni, 2003).

The lack of product liability insurance has caused numerous business failures. Businesses who make, distribute or sell products at risk for causing bodily harm can easily be bankrupt if a product they deal in causes multiple bodily injuries. Likewise, a single catastrophic jury verdict against such a business could render it insolvent. Thus, businesses that deal in potentially dangerous products need to carefully consider how to solve the problem of product liability insurance (Sarantakos, 2005).

Supply Chain Insurance provides “all risks” coverage which is not restricted to property damage, because physical damage is historically not one of the most frequent causes of interruption. The supply chain insurance can cover all supplier Tiers, and can finance extra recovery expenses. It also offers the option of a pre-agreed claims methodology to increase transparency, certainty and speed of claims. It can complement and fills gaps in other coverage (business interruption, contingent, political risk, marine and trade credit), helping to fortify risk management programs (Lu et al., 2010).

Taking the steps necessary to identify, assess and manage supply chain exposures can help organizations avoid disruptions that can carry serious financial and reputational consequences. Most researchers looks at both natural and man-made sources of supply chain disruptions, and examines the challenge of managing supply chain risk not only at the level of direct suppliers, but farther up the supply chain with suppliers of suppliers (Cabinet Office, 2011).

### **Insurance policies and Regulations**

Insurance regulation that governs the business of insurance is typically aimed at assuring the solvency of insurance companies. Thus, this type of regulation governs capitalization, reserve policies, rates and various other "back office" processes (Lew and Overholt, 1999).

### **Warranties**

In commercial contracts generally, a warranty is a contractual term, breach of which gives right to damages alone; whereas a condition is a subjectivity of the contract, such that if the condition is not satisfied, the contract will not bind. By contrast, a warranty of a fact or state of affairs in an insurance contract, once breached, discharges the insurer from liability under the contract from the moment of breach; while breach of a mere condition gives rise to a claim in damages alone (Schexnayder et al., 2004).

### **The Association of Kenya Insurers (AKI)**

The Association of Kenya Insurers (AKI) was thereafter established in 1987 as an independent nonprofit making consultative and advisory body. The Association was registered under the Societies Act, Cap 108 of the Laws of Kenya on 5th January, 1988 and on 21st of January, 1988 the AKI Constitution was ratified and adopted by members. The Association currently has forty six (46) members. AKI is a Member's-Association for the Insurance companies in Kenya. The membership of the Association is open to any Insurance company duly registered under the Insurance Act to transact business in Kenya. The Association's main objective is to promote adherence to prudent business practices by its members and to creating awareness among the general public with a view of accelerating the growth of the insurance business in Kenya.

There are several types of insurance policies that are offered by different companies in the insurance industry globally and in Kenya. They include the following;

### **Employer's Liability Insurance**

Under the Employer's Liability (Compulsory Insurance) Act 1969, with a few exceptions, it is compulsory for any person or organization employing people to take out and maintain insurance against its legal liability for accidents to, or diseases sustained by, its employees in the course of their employment. The reason for it being compulsory is to ensure that an injured employee or his dependants obtain compensation regardless of whether or not the employer has the financial resources to meet the employee's claim. Each project participant employing people and falling with the legislation must therefore comply with the statute (El-Adaway & Kandil, 2010).

### **Public Liability Insurance**

Public Liability Insurance, also called "Third Party Policy", covers the insured's liability for: injury to or death of people other than its own employees; and damage to property other than the works. Sometimes this cover is extended to cover loss or damage for which the insurer is not liable to the project owner, e.g. subsidence to neighboring property and other types of damage

that are the unavoidable consequences of carrying out the works in accordance with the contract documents for which the project owner, rather than the insurer, is responsible (Lu et al., 2010).

### **CAR Insurance**

This policy covers loss/damage to the contractor's construction works, site materials and constructional plant. The name is a misnomer because no policy available in the insurance market covers every form and cause of loss/damage to contract works (Bunni, 2003).

### **Combined Policies**

Although the common practice is to have cover against employer's liability, public liability and loss or damage to the contract works as separate policies, it is possible to have a composite policy covering all these three risk categories (Corbett, 2004).

### **PI Insurance**

The purpose of this type of policy is to indemnify professional persons (e.g. engineers, architects and surveyors) against liability arising from any breach of their professional duty. It is normally taken on an annual basis. A major difference between this type of policy and the others is that it is on a "claims made" basis, i.e. the insured is entitled to indemnity only if the policy was effective when the claim was made. Whether the policy was in place when the professional acted in breach of his duty or when the damage occurred is irrelevant (Murray & Langford, 2003).

The other types of policies are on an "occurrence" basis, i.e. the insured is covered only if the insurance was in place when the damage or loss occurred. For this reason, underwriters of PI policies will normally pay more attention to the previous activities of the insured than with other types of policies (Wright, 2005).

### **Design and Build Professional Liability Insurance**

Under the contract for the procurement of a facility by the design and build procurement method, the contractor carries the design risk even if it sub-contracts the design element to a professional architect or engineer. The contractor under a traditional contract would also be taking on responsibility for design if part of the design is left to the contractor to provide. Under English common law the contractor in each of these situations is under a duty to ensure that the design it provides is fit for purpose. Under the terms of some standard forms of contract this duty is often limited to one of exercising reasonable skill and care, the standard required of professional architects and engineers. An option open to the contractor is to rely on the cover of external consultants to which it sub-contracts the design element of the project (Rycroft, 2009).

### **Terrorism Cover**

In contracts for the modernization or modification of existing facilities the requirement to insure the existing facility and its contents against loss or damage did not exclude damage by terrorism. Insurer's response to increased terrorist activity in recent times has been to withdraw full cover in respect of terrorism from their standard commercial policies on account of astronomical rises in levels of claims (Wright, 2005)..

### **Motor Vehicle and Movable Plant Insurance**

Execution of construction projects requires the use of motor vehicles to transport men, materials and machines between their places of origin and their points of use. Insurance has to be taken against certain risks associated with the use of such vehicles since a driver of motor vehicle on a road must have, as a minimum, insurance against personal injury and death caused by the vehicle. Extended cover, referred to as “Third Party, Fire and Theft” cover, is available. This covers not only personal injury and death but also damage to property and loss of or damage to the vehicle from fire or theft. An even more extensive cover, referred to as “comprehensive insurance”, includes accidental damage to the vehicle itself (Mead, 2008).

### **Insurance Against Loss of Delay Damages**

Liquidated damages (delay damages specified in the contract) are normally based on estimates of the loss likely to be incurred by the project owner if it is not completed by the contractual completion date. Where the contractor is awarded extension of time under the terms of the contract, liquidated damages for the period of extension are no longer payable even though the project owner may still suffer loss from delayed completion (Bishop, 2003).

For two reasons, the project owner’s actual loss may be far in excess of the liquidated damages in the contract. First, as liquidated damages are assessed at the time of contract execution; actual events may turn out different from those assumed in their calculation, e.g. higher inflation than anticipated. Second, it covers the project owner for only the period of delayed completion whilst losses could be incurred beyond that period. For example, the effect of the delay may that prospective customers pull out together (Mead, 2002).

### **Latent Defects Insurance**

Latent defects insurance is designed to protect the project owner against defects that it might have to make good of it. Even where liability is for the appropriate limitation period, the project owner may be unable to assign its rights under the contract to third parties, e.g. tenants and purchasers, because of a common practice of expressly prohibiting assignment in the relevant contracts (Mentzer, 2001).

### **Insurance policies and supply chain risk management**

In supply chain management, procurements process presents considerable risk of personal injury, damage to existing property and financial loss. However an important plank of any effective risk management strategy is to ensure that insurance cover is available against certain risks. Most of the myriad of contracts entered into to procure impose obligations on certain contractual parties, particularly prime suppliers, contractors and designers, to take out and maintain insurance against specified risks. One source of this unnecessary cost is duplication in cover arising from the different stakeholders taking out and maintaining policies that overlap in the risks that they cover (Madine, 2002; Bunni, 2003; Kelly, 2004).

The policies required in contracts are available from different insurers and in different wordings. Bunni (2003) highlights the complexity of the insurance arrangements and the high transaction

costs of ensuring compliance with the insurance requirements in the many contracts entered into to realise even a project of modest size. The multiplicity of policies, insurers and insured parties often engulf the process of claiming on a policy in time-consuming and costly disputes. As the large volume of case law suggests, the disputes concern which of the actors on the project caused the occurrence of the risk, whether the risk is within the wording of the policy and subrogation rights against members of the project supply chain (Mead, 2002; Bishop, 2003; Sarakis, 2006; Mead, 2008; Ndekugri and Rycroft, 2009). Wright (2002) explains that the effect of time-consuming litigation to determine where liability should ultimately fall is such that a large proportion of the amount paid out by insurers goes to meet the legal costs of such litigation.

### **Empirical literature review**

The degree of the vulnerability of a supply chain is determined to a large extent by the degree of complexity of the network (Nieger et al., 2008). In recent times the complexity has increased many-fold due to firms' focus on their core competence and increased dependence on outsourcing. Top executives at Global 1000 firms now consider supply chain disruptions and their associated operational and financial risks to be their single most pressing concern (Craighead et al., 2007). Risk management in supply chain cannot be equated to disaster response. Rather, it means keeping an increasingly complex process moving efficiently at the lowest total cost and without compromising the quality of the product or customer satisfaction (Hauser, 2003). Supply chain risk management (SCRM) is defined as "the process of risk mitigation achieved through collaboration, co-ordination and application of risk management tools among the partners, to ensure continuity coupled with long term profitability of the supply chain" (Faisal et al., 2007a). SCRM is still a fairly new field of research and studies related to the topic are scarce (Ojala and Hallikas, 2006; Jüttner, 2005). It should also be noted that risks cannot be completely eliminated from supply chains but strategies can be developed to manage these risks if the dynamics between the variables related to risks in a supply chain are understood (Faisal et al., 2006).

It is important for supply chain managers to recognize that in taking action to reduce known risks, they are changing the risk profile for that organization and for others in the network (Peck, 2005). Thus, for mitigating risk in supply chains it is required to expend the risk management focus from the companies' own sites to suppliers and sub-suppliers. There is a need to work together in risk identification, assessment, management and business continuity planning and also of formal assessment of how suppliers are working with those issues and by putting requirements into contracts (Normann and Jansson, 2004). Risk management skills which includes, awareness of risk signals, developing risk management plans, and improving end to end information visibility are essential requirements for supply chain management success (Giunipero and Percy, 2000; Christopher and Lee, 2004). While revisiting single-sourcing decisions and changing inventory management policies will likely help maintain continuity during future crises, experts have clearly demonstrated, and logistics managers have candidly

admitted, that firms need to vastly improve their disaster management planning for managing risk in supply chains (Hale and Moberg, 2005).

## **Research Methodology and Design**

### **Research Design**

Research design refers to the way the study is designed, that is, the method used to carry out a research. The focus of this study is quantitative. However, some qualitative approach will be used in order to gain a better understanding and possibly enable a better and more insightful interpretation of the results from the quantitative study. This research will be conducted through a case study descriptive design. It will seek to investigate the role of insurance function in supply chain risk management in Kenya: Case study Kenya Reinsurance Corporation Limited.

### **Study Population**

Study population in statistics is the specific population about which information is desired. According to Ngechu (2004), a population is a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. This definition ensures that population of interest is homogeneous. In addition, by population the researcher means complete census of the sampling frames. Population studies also called census are more representative because everyone has equal chance to be included in the final sample that is drawn according to Mugenda and Mugenda (2003).

### **Target Population**

The target population of this study will be the staff working at Kenya Reinsurance Corporation in Nairobi Kenya. The population characteristic is as summarized in the table below. Mugenda and Mugenda, (2003), explain that the target population should have some observable characteristics, to which the researcher intends to generalize the results of the study. This definition assumes that the population is not homogeneous. Therefore, the researcher will examine a sample of staff drawn from the population of 100 staff working at Kenya Reinsurance Corporation in Kenya.

### **Sample Design**

The sampling plan describes the sampling unit, sampling frame, sampling procedures and the sample size for the study. The sampling frame describes the list of all population units from which the sample will be selected (Cooper & Schindler, 2003). Sample of responding staff will be drawn from all employees working at Kenya Reinsurance Corporation in Nairobi. From the above population of 100, a sample of 30 respondents from within each group in proportions that each group bear to the population as a whole will be taken using stratified random sample which will give each item in the population an equal probability chance of being selected.

According to Mugenda & Mugenda (2003), when a population is small, a sample equivalent to 30% of the total population will be an equal representative of the entire population. Stratified random sampling technique will be used when population of interest is not homogeneous and can be subdivided into groups or strata to obtain a representative sample.

### **Data Collection Procedures**

This study will collect quantitative data between January 2011 and May 2013. Data will be collected using a self-administered questionnaire. Nevertheless, where it will prove difficult for the respondents to complete the questionnaire immediately, the researcher will leave it with the respondents and come to pick them up later.

The structured questions will be used in an effort to conserve time and money as well as to facilitate in easier analysis as they are in immediate usable form; while the unstructured questions will be used so as to encourage the respondent to give an in-depth and felt response without feeling held back in revealing of any information. Each questionnaire will be coded and only the researcher will be privy to the identity of the respondent.

With respect to change management, this paper will utilize a questionnaire used in various previous research projects (Lumpkin & Dess, 2001). The questionnaire designed in this study comprise of two sections. The first part includes the demographic and operational characteristics designed to determine fundamental issues including the demographic characteristics of the respondents. The second part is devoted to the identification of the role of insurance function supply chain risk management where the four variables of the study are put into focus.

### **Data Analysis**

Before processing the responses, the completed questionnaires will be edited for completeness and consistency. The data will then be coded to enable the responses to be grouped into various categories. Data collected will be purely quantitative and it will be analyzed by descriptive analysis. The descriptive statistical tools will help the researcher to describe the data and determine the extent to be used. The Data analysis will use SPSS version 19 as tool of analysis. The data will be presented using tables and charts will be used to summarize responses for further analysis and facilitate comparison.

### **Data Analysis, Presentation And Interpretation**

The data analysis is based on the use of numerical data in form of numbers, classes and levels. The numerical data was analyzed through the use of descriptive statistics and the output presented by use of tables and pie charts. The above study shows the total number of the returned questionnaires and the unreturned questionnaires. The total number of questionnaires that were distributed to the field was 30 whereby 29 questionnaires which represent 96.7% were returned fully answered while only 1 questionnaire which represent 3.3% was not returned. The respondent was not available during the time of data collection. This indicates that there was a good response rate.



### **Demographic Information**

The study found out that majority of the respondents were male by 55.2% while female were only 44.8%. This shows that Kenya Reinsurance Corporation staffs are both males and females though males are the majority with 55.2% rate.

The study found out that majority of the respondents have attained a degree at 31.0%, other colleges at 27.6% and only 17.2% have masters. This shows that Kenya Reinsurance Corporation staffs are well educated for their task.

The study found out that majority of the respondents have worked with Kenya Reinsurance Corporation for above 6 years as indicated by 48.3%. This shows that respondents had enough experience to participate this study.

### **Business continuity management**

The study sought to determine how the respondents would describe the level of business continuity management in their organization. From the findings, respondents felt that the business continuity management is on average level as indicated by a mean of 2.9 and standard deviation of 0.47.

The study sought to determine whether business continuity management affect supply chain risk management in the respondents' organization. From the findings, business continuity management affect supply chain risk management at great extent as indicated by a mean of 2.07 and standard deviation of 0.43.

The study sought to determine to what extent the respondents agree with the above statements on the influence of business continuity management in supply chain risk management in the respondents organization. From the findings, the respondents agree that "business continuity management skills in insurance essential" and "business continuity management in insurance to have any effect on supply chain risk management" as indicated by a mean of 2.10 and 2.34, and standard deviation of 0.22 and 0.17 respectively. The respondents are neutral that "business continuity management assisted you to operate your business" and "business continuity management offered by your organization adequate enough in supply chain risk management" as indicated by a mean of 2.62 and 2.83, and standard deviation of 0.31 and 0.24 respectively.

### **Information dissemination & sharing**

The study sought to determine to what extent does information dissemination and sharing in insurance affects supply chain risk management in the respondents' organization. From the findings, the respondents are at very great extent that information dissemination and sharing in insurance affects supply chain risk management in the respondents' organization as indicated by a mean of 1.48 and standard deviation of 0.30.

The study sought to determine to level of agreement with the following statements that relate to information dissemination and sharing and its effect on supply chain risk management. From the findings, the respondents agree that "the information sharing process developed by your

organization improve risk management”, “lack of information sharing leads to panic and chaotic behavior that affect risk management in supply chain” and “information dissemination make supply chain bonds strong” as indicated by a mean of 1.97, 2.24 and 2.38, and standard deviation of 0.23, 0.24, and 0.17 respectively. The respondents are neutral that “free exchange of information reduces lead times, coordination & distribution costs hence minimizing supply chain risks” as indicated by a mean of 2.90 and standard deviation of 0.27.

### **Cost of insurance products affects supply chain risk management**

The study sought to determine whether Cost of Insurance products affects supply chain risk management. From the findings, 76% of the respondents felt that Cost of Insurance products affects supply chain risk management while 24% felt that Cost of Insurance products does not affect supply chain risk management.

The study sought to determine whether Cost of Insurance products is an effective risk sharing instrument along supply chains. From the findings, 59% of the respondents felt that Cost of Insurance products is an effective risk sharing instrument along supply chains while 41% felt that Cost of Insurance products is not an effective risk sharing instrument along supply chains.

The study sought to determine whether Insurance function is risk focused. From the findings, 69% of the respondents felt that Insurance function is risk focused while 31% felt that Insurance function is not risk focused.

The study sought to determine to level of agreement with the above statements that relate to Cost of Insurance products and its effects on supply chain risk management. From the findings, the respondents agree that “Low Cost of Insurance products in business helps achieve long-term competitive advantage along supply chains”, “Adequate Cost of Insurance products devotes considerable energy in negotiating equitable arrangements for supply chain risk sharing” and “Chosen prices of products manage risks along supply chains” as indicated by a mean of 2.14, 2.24 and 2.45, and standard deviation of 0.32, 0.27, and 0.18 respectively. The respondents are neutral that “High cost of products reduces levels of resources, declining partnership and profitability along supply chains” as indicated by a mean of 2.72 and standard deviation of 0.22.

### **Insurance policies and regulations**

The study sought to determine whether Insurance policies and Regulations are adequately protected by the government. From the findings, 86% of the respondents felt that Insurance policies and Regulations are adequately protected by the government while 14% felt that Insurance policies and Regulations are not adequately protected by the government.

The study sought to determine to what extent the respondents agree with the above statements on Insurance policies and Regulations and its effects on supply chain risk management. From the findings, the respondents agree that “Insurance policies & regulations provide a poor environment for proactive decision making to determine which risks to deal with”, “Improved policies & regulations on risks in supply chain helps make better decisions & decrease risks” and “Understanding variety & interconnectedness of insurance policies helps managers tailor balanced, effective risk-reduction strategies along supply chain” as indicated by a mean of 2.14,

2.21 and 2.38, and standard deviation of 0.31, 0.35, and 0.30 respectively. The respondents are neutral that “Lack of adequate risk policies and regulations affects negatively management of risks along supply chains in an organization” as indicated by a mean of 2.69 and standard deviation of 0.27.

### Regression analysis

Multiple regression is a flexible method of data analysis that is appropriate whenever a quantitative variable (the dependent or criterion variable) is examined in relationship to any other factors (expressed as independent or predictor variables). Relationships are either nonlinear, independent variables are quantitative or qualitative, or one can examine the effects of a single variable or multiple variables with or without the effects of other variables taken into account (Cohen, Cohen, West, & Aiken, 2003).

In this case the researcher use Analysis of Variance to test the overall objective/hypothesis, the data on various aspect of effects of insurance function in supply chain risk management was subjected to ANOVA test using statistical package for social science to help to test the hypothesis that there is no relationship between effects of insurance function and supply chain risk management. The calculated values were compared with critical value to establish whether to reject or accept hypothesis. The ANOVA results are summarized in Table 1.

**Table 1: Summary of ANOVA on ease of use of social media service**

	Sum of squares	df	Mean Square	F	$\alpha$
Between groups	10.852	7	1.477	$F_o = 7.468$	$\alpha_o = .050$
Within groups	4.485	22	0.198	$F_c = 2.663$	$\alpha_c = .000$
<b>Total</b>	<b>15.337</b>	<b>29</b>			

Note: df = degrees of freedom; F = Anova;  $\alpha$  = level of significance;  $F_o$  = calculated value of F;  $F_c$  = the critical value of F;  $\alpha_o$  = calculate value of  $\alpha$ ; and  $\alpha_c$  = the critical value of  $\alpha$ .

The information in Table 1 explains that,  $F_o = 7.468 > F_c = 2.663$ ; and  $\alpha_o = .050 > \alpha_c = .000$ . This means that there is a significant difference in the effects of insurance function with various aspects supply chain risk management. The hypothesis that there is no relationship between effects of insurance function and supply chain risk management was therefore rejected.

## Summary of the findings

### **Business continuity management**

The study revealed that the business continuity management is on average level, business continuity management affect supply chain risk management at great extent, the respondents agree that “business continuity management skills in insurance essential” and “business continuity management in insurance to have any effect on supply chain risk management” and the respondents are neutral that “business continuity management assisted you to operate your business” and “business continuity management offered by your organization adequate enough in supply chain risk management”.

### **Information dissemination & sharing**

The study revealed that the respondents are at very great extent that information dissemination and sharing in insurance affects supply chain risk management in the respondents’ organization, the respondents agree that “the information sharing process developed by your organization improve risk management”, “lack of information sharing leads to panic and chaotic behavior that affect risk management in supply chain” and “information dissemination make supply chain bonds strong” and the respondents are neutral that “free exchange of information reduces lead times, coordination & distribution costs hence minimizing supply chain risks”.

### **Cost of Insurance products**

The study also revealed that majority of the respondents felt that Cost of Insurance products affects supply chain risk management, 59% of the respondents felt that Cost of Insurance products is an effective risk sharing instrument along supply chains, 69% of the respondents felt that Insurance function is risk focused while 31% felt that Insurance function is not risk focused. The study revealed that, the respondents agrees that “Low Cost of Insurance products in business helps achieve long-term competitive advantage along supply chains”, “Adequate Cost of Insurance products devotes considerable energy in negotiating equitable arrangements for supply chain risk sharing” and “Chosen prices of products manage risks along supply chains” and the respondents are neutral that “High cost of products reduces levels of resources, declining partnership and profitability along supply chains”.

### **Insurance policies and regulations**

The study finally revealed that, 86% of the respondents felt that Insurance policies and Regulations are adequately protected by the government while 14% felt that Insurance policies and Regulations are adequately protected by the government. The study found out that, the respondents agrees that “Insurance policies & regulations provide a poor environment for proactive decision making to determine which risks to deal with”, “Improved policies & regulations on risks in supply chain helps make better decisions & decrease risks” and “Understanding variety & interconnectedness of insurance policies helps managers tailor balanced, effective risk-reduction strategies along supply chain” and the respondents are neutral

that “Lack of adequate risk policies and regulations affects negatively management of risks along supply chains in an organization”.

### Conclusions

Business continuity management in insurance helps in supply chain risk management in Kenya by development of strategies, plans and actions which provide protection or alternative modes of operation for those activities or business processes which, if they were to be interrupted, might otherwise bring risk supply chain. Information dissemination and sharing in insurance affects supply chain risk management in Kenya by a great extent this concurs with Childerhouse et al., (2003) that information sharing is vital for supply chains as lack of information lead to panic, chaotic behavior and unnecessary costs . Insurance policies and regulations affects supply chain risk management in Kenya since insurance regulation that governs the business of insurance is typically aimed at assuring the solvency of insurance companies. Finally the level of cost of products in insurance affects supply chain risk management in Kenya at great extents.

### Recommendations

1. Proper information dissemination and sharing in insurance should be adopted in every organization for a good supply chain risk management.
2. Insurance policies and regulations should be improved in the aim of strengthening supply chain risk management.
3. Insurance companies to adopt low cost of products in business to help achieve long-term competitive advantage along supply chains.

### References

- Agarwal, A., Shankar, R. and Tiwari, M.K. (2005), “Modeling the metrics of lean, agile and leagile supply chain: an ANP-based approach”, *European Journal of Operational Research*, February 16, 2005.
- Bandyopadhyay, K., Mykytyn, P.P. and Mykytyn, K. (1999), “A framework for integrated risk management in information technology”, *Management Decision*, Vol. 37 No. 5,
- Barber, B., Lehavy, R., McNichols, M., & Trueman, B. 2001. Can investors profit from the prophets? Security analyst recommendations and stock returns. *The Journal of Finance*,
- Barnett, M. L. & Salomon, R. M. 2006. Beyond dichotomy: the curvilinear relationship between social responsibility and financial performance. *Strategic Management Journal*,
- Beamon, B.M. (1998), “Supply chain design and analysis: models and methods”, *International Journal of Production Economics*, Vol. 55 No. 3,
- Beamon, B.M. (1999), “Designing the green supply chain”, *Logistics Information Management*,
- Benner, M. J. & Ranganathan, R. 2009. Offsetting illegitimacy? How pressures from securities analysts influence incumbents in the face of new technologies. *Organization Science*,

- Benner, M. J. 2009. Securities analysts and incumbent response to radical technological change: evidence from digital photography and internet telephony. *Organization Science*.
- Bolumole, Y. (2002), *Supply Chain Vulnerability*, Cranfield University, Cranfield. Commerce, June 9-15.
- Brammer, S. & Millington, A. 2008. Does it pay to be different? An analysis of the relationship between corporate social and financial performance. *Strategic Management Journal*, 29(12):
- Brammer, S., Brooks, C., Pavelin, S., Down, C., & Park, W. 2006. Corporate social performance and stock returns: UK evidence from disaggregate measures. *Financial Management*, 35(3).
- Burt, D. and M. Doyle (1994). *The American Keiretsu: A Strategic Weapon for Global Competitiveness*. Illinois, USA, Irwin.
- Business Line (2003), "More gains likely for garment trade in post-quota regime", *Business Line*, September 28.
- buyers", *Industrial Management & Data Systems*, Vol. 105 No. 7,
- Cachon, G. (2002), *Supply Chain Coordination with Contracts*, The Wharton School of Business, University of Pennsylvania, Philadelphia, PA.
- California Management Review, Vol. 43 No. 3,
- Caputo, A.C., Cucchiella, F., Fratocchi, L., Pelagagge, P.M. and Scacchia, F. (2004), "Analysis and evaluation of e-supply chain performances", *Industrial Management & Data Systems*, case study", *Industrial Management & Data Systems*, Vol. 101 No. 1,
- Chandra, C. and Kumar, S. (2000), "Supply chain management in theory and practice: a passing fad or a fundamental change?", *Industrial Management & Data Systems*, Vol. 100 No. 3,
- Chartered Management Institute (CMI) (2002), *Business Continuity and Supply Chain Management*, report available at: [www.thebci.org/2809-01%20Bus%20Continuity%20Summ.pdf](http://www.thebci.org/2809-01%20Bus%20Continuity%20Summ.pdf)
- Chauhan, S.S. and Proth, J.M. (2004), "Analysis of a supply chain partnership with revenue sharing", *International Journal of Production Economics*, Vol. 97 No. 1,
- Cheng, E.W.L., Love, P.E.D., Standing, C. and Gharavi, H. (2006), "Intention to e-collaborate: propagation of research propositions", *Industrial Management & Data Systems*, Vol. 106 Chichester,
- Childerhouse, P., Hermiz, R., Mason-Jones, R., Popp, A. and Towill, D.R. (2003), "Information flow in automotive supply chains – identifying and learning to overcome barriers to change", *Industrial Management & Data Systems*, Vol. 103 No. 7,
- Chopra, S. and Sodhi, M.S. (2004), "Managing risk to avoid supply chain breakdown", *Sloan*
- Christopher, M. (2000), "The agile supply chain competing in volatile markets", *Industrial*
- Christopher, M. and Towill, D.R. (2000), "Supply chain migration from lean and functional to agile and customised", *Supply Chain Management: An International Journal*, Vol. 5 No.
- Christopher, M. and Towill, D.R. (2001), "An integrated model for the design of agile supply chains", *International Journal of Physical Distribution & Logistics Management*, Vol. 31
- Christopher, M., Lowson, R. and Peck, H. (2004), "Creating agile supply chains in the fashion industry", *International Journal of Retail & Distribution Management*, Vol. 32 No. 8,
- Christopher, M., McKinnon, A., Sharp, J., Wilding, R., Peck, H., Chapman, P., Ju" ttner, U., (2001), "Defining supply chain management", *Journal of Business Logistics*, Vol. 22 No.2

- Converium (2001), "Suppliers' extension or contingent business interruption insurance", criteria and selection", *Industrial Management & Data Systems*, Vol. 100 No. 5,
- Cousins, P. D. (1998). *The Snake and The Old Women: A Study of Inter-Firm Relationships*. World-Wide Purchasing Symposium, London, UK., Chartered Institute of Purchasing and Supply.
- Deloach, J.W. (2000), *Enterprise-wide Risk Management. Strategies for Linking Risk and Opportunities*, Financial Times/Prentice-Hall, London.
- Dey, P.K. and Ogunlana, S.O. (2004), "Selection and application of risk management tools and techniques for build-operate-transfer projects", *Industrial Management & Data Systems*,
- Duclos, L.K., Vokurka, R.J. and Lummus, R.R. (2003), "A conceptual model of supply chain flexibility", *Industrial Management & Data Systems*, Vol. 103 No. 6,
- Eisenhardt, K.M. (1989), "Building theories from case study research", *Academy of Management Review*, Vol. 14 No. 4,
- Emblemsvåg, J. and Kjølstad, L.E. (2002), "Strategic risk analysis – a field version", *Management Decision*, Vol. 40 No. 9,
- F. John Reh, (2012) "Measuring supply risk", *Practix, Best Practices in Purchasing and Supply Chain Risk Management*,
- Faisal, M.N. (2005), "Innovative supply chain lessons for Indian SMEs", *BVIMR-Management*
- Farmer, D. (1972). "The Impact of Supply Markets on Corporate Planning." *Long Range Planning* 5(1):
- Fawcett, S.E. and Magnan, G.M. (2004), "Ten guiding principles for high-impact SCM", *Business Horizons*, Vol. 47 No. 5,
- Finch, P. (2004), "Supply chain risk management", *Supply Chain Management: An International*
- Giannoccaro, I. and Pontrandolfo, P. (2004), "Supply chain coordination by revenue sharing contracts", *International Journal of Production Economics*, Vol. 89 No. 2,
- Giunipero, L.C. and Eltantawy, R.A. (2004), "Securing the upstream supply chain: a risk management approach", *International Journal of Physical Distribution & Logistics Management*, Vol. 34 No. 9,
- Green, K., Morton, B. and New, S. (1998), "Green purchasing and supply policies: do they improve companies' environmental performance?", *Supply Chain Management*, Vol. 3 No. 2,
- Grover, S., Agrawal, V.P. and Khan, I.A. (2004), "A digraph approach to TQM evaluation of an industry", *International Journal of Production Research*, Vol. 42 No. 19,
- Gunasekaran, G., Patel, C. and McGaughey, R.E. (2004), "A framework for supply chain performance measurement", *International Journal of Production Economics*, Vol. 87 No. 3,
- Hallikas, J., Karvonen, I., Pulkkinen, U., Virolainen, V.M. and Tuominen, M. (2004), "Risk management processes in supplier networks", *International Journal of Production Economics*, Vol. 90 No. 1,
- Hallikas, J., Virolainen, V.-M. and Tuominen, M. (2000), "Risk analysis and assessment in network environment – a dyadic case study", *Preprints of the 11th International Working*
- Harland, C., Brenchley, R. and Walker, H. (2003), "Risk in supply networks", *Journal of*
- Harland, C., R. Lamming (1999). "Developing the Concept of Supply Strategy." *International Journal of Operations and Production Management*
- Helo, P. (2004), "Managing agility and productivity in the electronics industry", *Industrial*

- Helo, P. and Szekely, B. (2005), "Logistics information systems an analysis of software solutions for supply chain co-ordination", *Industrial Management & Data Systems*, Vol. 105 No. 1,
- Hiles, A. and Barnes, P. (Eds) (2001), *The Definitive Handbook of Business Continuity Management*, J. Wiley & Sons, Chichester.
- Hines, P. (1994) *Creating World Class Suppliers: Unlocking Mutual Competitive Advantage*. London, Pitman.
- Hsieh, L-F. and Chen, S.K. (2005), "Incorporating voice of the consumer: does it really work?",
- Hsu, L-L. (2005), "SCM system effects on performance for interaction between suppliers and illustration from the telecommunication industry", *Proceedings of the Logistics Research Industrial Management & Data Systems*, Vol. 104 No. 1,
- Johnson, M.E. (2001), "Learning from toys: lessons in managing risk from toy industry",
- Johnson, M.E. (2001), "Learning from toys: lessons in managing supply chain risk from the toy industry", *California Management Review*, Vol. 43 No. 3,
- Ju' ttner, U., Peck, H. and Christopher, M. (2002), "Supply chain risk management: outlining an agenda for future research", in Griffiths, J., Hewitt, F. and Ireland, P. (Eds), *Proceedings of the Logistics Research Network 7th Annual Conference*,
- Karlsson, C. and Ahlstrom, P. (1997), "A lean and global smaller firm?", *International Journal of Kenya Reinsurance Corporation Limited (Kenya Re)*, 2013; [www.kenyaRe.co.ke](http://www.kenyaRe.co.ke)
- Kevin P. Coyne and Somu Subramaniam, "Bringing discipline to strategy", *The McKinsey Quarterly*, 1996, Number 4,
- Koh, C.E. and Nam, K. (2005), "Business use of the internet – a longitudinal study from a Lambert, D.M. and Cooper, M.C. (2000), "Issues in supply chain management", *Industrial Lamming, R. C. (1993) Beyond Partnership: Strategies for Innovation and Lean Supply*. London, Prentice-Hall.
- Lamming, R., Caldwell, N., Harrison, D. and Phillips, W. (2001), "Transparency in supply relationships: concept and practice", *Proceedings of the 10th International IPSERA*
- Lee, H.L. (2002), "Aligning supply chain strategies with product uncertainties", *California Lee, H.L. (2004), "The triple-A supply chain", Harvard Business Review*, Vol. 82 No. 10,
- Lee, H.L. and Wolfe, M. (2003), "Supply chain security without tears", *Supply Chain Management Review*, January/February,
- Lee, H.L., Padmanabham, V. and Whang, S. (1997), "The bullwhip effect in supply chains",
- Lin, C.T., Chiu, H. and Chu, P.Y. (2006), "Agility index in the supply chain", *International Journal of Production Economics*, Vol. 100 No. 2,
- Lindroth, R. and Norrman, A. (2001), "Supply chain risks and risk sharing instruments – an Lockamy, A. III and Smith, W.I. (2000), "Target costing for supply chain management:
- MacBeth, D. and N. Ferguson (1994) *Partnership Sourcing: An Integrated Supply Chain Approach*. London, Pitman Publishing Limited, U.K. *Management & Data Systems*, Vol. 104 No. 7,
- Mason-Jones, R. and Towill, D.R. (1999), "Total cycle time compression and the agile supply chain", *International Journal of Production Economics*, Vol. 62 Nos 1/2,
- Mason-Jones, R., Naylor, B. and Towil, D.R. (2000), "Engineering the leagile supply chain", *International Journal of Agile Management Systems*, Vol. 2 No. 1,
- McGrew, J.F. and Bilotta, J.G. (2000), "The effectiveness of risk management: measuring what didn't happen", *Management Decision*, Vol. 38 No. 4,
- Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. and Zacharia, Z.G.



- Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. and Zacharia, Z.G. (2001), "Defining supply chain management", *Journal of Business Logistics*, Vol. 22 No. 2, 1-25.
- Meredith, S. and Francis, D. (2000), "Journey towards agility: the agile wheel explored", *The TQM Magazine*, Vol. 12 No. 2,
- Michael E. Porter (2002),: *The Link between Competitive Advantage and Corporate Social Responsibility* strategic management: a stakeholder approach .Harvard Business Review
- Michael E. Porter. "The Five Competitive Forces that Shape Strategy", *Harvard Business Review*, January 2008,
- Michael Porter, Nicholas Argyres, Anita M. McGahan, "An Interview with Michael Porter", *The Academy of Management Executive* 16:2:44
- Michael Simkovic, *Competition and Crisis in Mortgage Securitization*
- Mistry, J.J. (2005), "Origins of profitability through JIT processes in the supply chain", *Industrial Management & Data Systems*, Vol. 105 No. 6,
- Mitchell, V-W. (1999), "Consumer perceived risk: conceptualisations and models", *European*
- Morgan, J. (2004), "Poor risk management threatens supply chains", *Purchasing*, June 5.
- Mullai, A. and Paulsson, U. (2002), *Oil Spills inO resund – Hazardous Events, Causes and Claims*, Lund University, Lund.
- Musson, M. (2001), "BC strategies for manufacturing and logistics", in Hiles, A. and Barnes, P. (Eds), *The Definitive Handbook of Business Continuity Management*, J. Wiley & Sons,
- Narayanan, V.G. and Raman, A. (2004), "Aligning incentives in supply chains", *Harvard Business Review*, Vol. 82 No. 11,
- Naylor, J.B., Naim, M.M. and Berry, D. (1999), "Leagility: integrating the lean and agile manufacturing paradigms in the total supply chain", *International Journal of Production Economics*, Vol. 62 Nos 1/2,
- Network 6th Annual Conference, Heriot-Watt University, 13-14 September,
- Nishiguchi, T. (1994) *Strategic Industrial Sourcing: The Japanese Advantage*. Oxford, UK,Oxford University Press No. 1,
- Noori, H. and Lee, W.B. (2000), "Fractal manufacturing partnership: exploring a new form of strategic alliance between OEMs and suppliers", *Logistics Information Management*, Vol. 13 No. 5,
- Norrman, A. and Jansson, U. (2004), "Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident", *International Journal of Physical Distribution & Logistics Management*, Vol. 34 No. 5,
- Norrman, A. and Lindroth, R. (2002), "Supply chain risk management: purchasers' vs planners' views on sharing capacity investment risks in the telecom iindustry", *Proceedings of the 11th International Annual IPSERA Conference*, Twente University, 25-27 March, Nos 1/2,
- Ohno, T. (1988), *The Toyota Production System; Beyond Large Scale Production*, Productivity
- Olorunniwo, F. and Hartfield, T. (2001), "Strategic partnering when the supply base is limited: a Operations & Production Management, Vol. 17 No. 10,
- Orlitzky, M., Schmidt, F. L., & Rynes, S. L.( 2003) *Corporate social and financial performance: A meta-analysis*. *Organization Studies*, 24(3): 403-441.

- Peng, Y-C., Trappey, C.V. and Liu, N-Y. (2005), "Internet and e-commerce adoption by the pp. 1099-114.
- Prater, E., Biehl, M. and Smith, M.A. (2001), "International supply chain agility: tradeoffs between flexibility and uncertainty", International Journal of Operations & Production Press, Portland, Vol.4 N02,
- Rahman, Z. (2004), "Use of internet in supply chain management: a study of Indian companies", Ramnath, S., , & Shane, P( 2008) The financial analyst forecasting literature: a taxonomy with suggestions for further research. International Journal of Forecasting, 24(1):
- Rao, R.V. and Gandhi, O.P. (2001), "Digraph and matrix methods for the machinability evaluation of work materials", International Journal of Machine Tools & Manufacture,
- Ring, P. S. and A. H. Van de Venn (1992) "Structuring Co-operative Relationships between Organisations'." Strategic Management Journal
- Ritchie, B., Brindley, C., Morris, J. and Peet, S. (2000), "Managing risk within the supply chain", paper presented at the 9th International IPSERA conference, Ontario, May. (The Royal Society (1992), Analysis, Perception and Management, The Royal Society, London.
- Rowley, T. & Berman, S.( 200) A brand new brand of corporate social performance. Business & Society, 39(4): 397.
- Russo, F. (2003), "Consortia in the machine tool cluster of Bangalore", Cluster eNews, IV.
- Sahay, B.S. (2003), "Understanding trust in supply chain relationships", Industrial Management
- Sahay, B.S. and Maini, A. (2002), "Supply chain: a shift from transactional to collaborative partnership", Decision, Vol. 29 No. 2,
- Saunders, M. (1994). Strategic Purchasing and Supply Chain Management. London, UK, Pitman.  
Seminar on Production Economics, pp. 255-70.
- Sen, S. & Bhattacharya, C. B. (2001) Does doing good always lead to doing better? Consumer reactions to corporate social responsibility. Journal of Marketing Research, 38(2):
- Waldman, D., Siegel, D., & Javidan, M.( 2006). Components of CEO transformational Leadership and corporate social responsibility Journal of Management Studies, 43(8): 1703
- Shtub, A., Bard, J.F. and Globerson, S. (1994), Project Management: Engineering, Technology, and Implementation, Prentice-Hall, Englewood Cliffs, NJ.
- Siegel, D. & Vitaliano, D. F.( 2007) An empirical analysis of the strategic use of corporate Social responsibility Journal of Economics & Management Strategy, 16(3): 773-792.
- Simons, R. (1995). "Control in an Age of Empowerment." Harvard Business Review(March - April): 80-95.
- Sinha, P.R., Whitman, L.E. and Malzahn, D. (2004), "Methodology to mitigate supplier risk in an aerospace supply chain", Supply Chain Management: An International Journal, Vol. 9 No. 2,
- Slack, N. (1994) "The Importance-Improvement Matrix as a Determinant of Improvement Priority." International Journal of Operations & Production Management Sloan Management Review, Vol. 38 No. 3,
- Slone, R.E. (2004), "Leading a supply chain turnaround", Harvard Business Review, Vol. 82 No.10,

- Smeltzer, L.R. and Siferd, S.P. (1998), "Proactive supply management: the management of risk", So, M.W.C. and Sculli, D. (2002), "The role of trust, quality, value and risk in conducting e-business", *Industrial Management & Data Systems*, Vol. 102 No. 9,
- Souter, G. (2000), "Risks from supply chain also demand attention", *Business Insurance*, Vol. 34
- Speckman, R.E. and Davis, E.W. (2004), "Risky business: expanding the discussion on risk and the extended enterprise", *International Journal of Physical Distribution & Logistics Management*, Vol. 34 No. 5,
- Spekman, R.E., Kamauff, J.W. Jr and Myhr, N. (1998), "An empirical investigation into supply chain management: a perspective on partnerships", *Supply Chain Management*, Vol. 3 No. 2,
- Stratton, R. and Warburton, R.D.H. (2003), "The strategic integration of agile and lean supply", *International Journal of Production Economics*, Vol. 85 No. 2, pp. 183-98.
- Strauss, B. (1995) "Internal Services: Classification and Total Quality." *International Journal of Service Industry Management*
- Surendar, T. and Rajshekhar, M. (2004), "Dressing up for the party", *Buisnessworld*, April 5.
- Svensson, G. (2000), "A conceptual framework for the analysis of vulnerability in supply chains", *International Journal of Physical Distribution & Logistics Management*, Vol. 30 No. 9,
- Svensson, G. (2001), "Perceived trust towards suppliers and customers in supply chains of the Swaminathan, J.M. (2003), "SARS exposes risks of global supply chains", *The Journal of Swedish automotive industry*", *International Journal of Physical Distribution & Logistics Management*, Vol. 31 No. 9,
- Tayur, S. et al. (Eds), *Quantitative Models for Supply Chain Management*, Kluwer Academic, Norwall, MA, through exception handling", *International Journal of Production Research*, Vol. 41 No. 6,
- Tsay, A.A. (1999), "The quantity flexibility contract and supplier-customer incentives", Tsay, A.A., Nahmias, S. and Agrawal, N. (1998), "Modelling supply chain contracts: a review", value chain perspective", *Industrial Management & Data Systems*, Vol. 105 No. 1,
- van-Hoek, R.I. (2000), "The thesis of leagility revisited", *International Journal of Agile Management Systems*, Vol. 2 No. 3,
- van-Hoek, R.I., Harrison, A. and Christopher, M. (2001), "Measuring agile capabilities in the supply chain", *International Journal of Operations & Production Management*, Vol. 21
- Wall Street Journal (2001), "Trial by fire – a blaze in Albuquerque sets off major crisis for cell-phone giants", 29 January.
- Wani, M.F. and Gandhi, O.P. (1999), "Development of maintainability index for mechanical systems", *Reliability Engineering & System Safety*, Vol. 65 No. 3,
- Wernerfelt, B. (1984), A resource-based view of the firm, *Strategic Management Journal*, Vol. 5, (April-June):
- Xu, H.Q.C.B., Besant, C.B. and Ristic, M. (2003), "System for enhancing supply chain agility
- Yin, R.K. (1994), *Case Study Research – Design and Methods*, Applied Social Research Methods Series, Vol. 5, Sage Publications, Thousand Oaks, CA.
- Yu, Z., Yan, H. and Cheng, T.C.E. (2001), "Benefits of information sharing with supply chain partnerships", *Industrial Management & Data Systems*, Vol. 101 No. 3,
- Yusuf, Y.Y., Gunasekaran, A., Adeleye, E.O. and Sivayoganathan, K. (2004), "Agile supply chain capabilities: determinants of competitive objectives", *European Journal of Operational Research*, Vol. 159 No. 2,

- Zeng, A.Z. and Pathak, B.K. (2003), "Achieving information integration in supply chain management through B2B e-hubs: concepts and analyses", *Industrial Management & Data Systems*, Vol. 103 No. 9,
- Zhenxin, Y., Yan, H. and Cheng, T.C. (2001), "Benefits of information sharing with supply chain partnerships", *Industrial Management & Data Systems*, Vol. 101 Nos 3/4,
- Zolkos, R. (2003), "Attention to supply-chain risks grows", *Business Insurance*, Vol. 37 No. 30,
- Zsidisin, G. (2001), "Measuring supply risk: an example from Europe", *Practix, Best Practices in Purchasing and Supply Chain Management*, June,
- Zsidisin, G. and Ellram, L.M. (1999), "Supply risk assessment analysis", *Practix, Best Practices in Purchasing and Supply Chain Management*, June,
- Zsidisin, G., Panelli, A. and Upton, R. (2000), "Purchasing organization involvement in risk assessment, contingency plans, and risk management: an exploratory study", *Supply Chain Management: An International Journal*, Vol. 5 No. 4,