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Bidding Strategies for Carrier in Combinatorial Transportation Auction

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Abstract

In combinatorial auction for truckload transportation service procurement, we introduce the bidding strategy for carrier facing the hard valuation problem to all possible routes. The model uses a bid-to-cost ratio of carriers surveyed in Thailand to represent the bidding behavior in combinatorial freight procurement. This model facilitates carrier to value the bid price for interested packages that involve with pattern of transportation service under different competitive environment. The results of analysis with hypotheses in regression model reveal significantly that a pattern of transportation service, a number of competitors, and a pre-empty backhaul to new lane distance ratio with number of competitors do impact negatively on a bid-to-cost ratio of carrier, whereas a pre-empty backhaul to new lane distance ratio does impact positively on a bid-to-cost ratio of carrier in combinatorial transportation auction. To find optimal bid price for interested packages in the incomplete information game, the empirical study in stochastic optimization problem with Monte Carlo method can provide the best solution for carrier in order to acquire the maximum expected profit in the auction. The results present that the expected profit with optimal solution of bidder is more than the average benefit in the competition market obviously. While in turn the results also show that shipper could potentially reduce the cost of transportation service procurement regarding our solution algorithm considerably.

Keywords: A Bid-to-Cost Ratio, Bid Price, Combinatorial Auction, Transportation Procurement, Bidding Strategies, Optimization Problem.

1. INTRODUCTION

Land freight transportation by truck plays an important role in driving the economy since it has a main responsibility to deliver the goods or materials from producers to marketplaces inevitably. According to the statistics of Department of Land Transport in Thailand, it reported that land freight transportation in 2009 accounted for more than 84% of nationwide freight movement or 423.7 million tones. While demand of land freight transportation has been increasing continuously due to expanding of market, it then impacts directly to shippers who have not been sufficient of in-house transportation capacity. Thus, shipper has initially used the *Request for Proposal* (RFP) to invite a set of carriers to participate into the auction in order to procure transportation service with lane by lane (Sheffi, 2004). To buy the freight transportation service by RFP, most shippers have used it until in late 1990, while some shippers still manipulate this method including shippers in Thailand. Specifically, carriers engaging in this traditional auction have to submit bids on interested individual lane separately. Thus, it does not guarantee carriers to acquire a complete set or cycle route of individual lanes, and it may cause an empty backhaul or repositioning cost called *exposure problem* (Kwasnica, et al., 2005). In Thailand, the Department of Land Transport revealed that 46% of total truck shipments or 33 million trips were empty backhauls. It indicated that carriers consumed fuel uselessly estimated in amount of 22.5 billion baht lost per year

(Department of Land Transport, 2006), and particularly this problem is still the critical economic issue up to the present time.

Therefore, *Combinatorial Auction* (CA) has been considering for overcoming the problem. That is, it allows bidder to submit multiple bids in combination of individual lanes to address this problem (W. Elmaghraby and P. Keskinocak, 2002). Carriers joining in combinatorial auction could reduce empty backhaul or repositioning cost to meet economies of scope (Sheffi, 2004). In USA, many shippers have extensively applied CA to procure transportation service from carrier, and they have used the optimization model called *Winner Determination Problem* (WDP) to allocate the awarded bids to the winner in order to minimize the total cost of transportation service procurement (De Vries, et al., 2003; Caplice and Sheffi 2003; Song and Regan 2003). However, the number of possible routes (packages) for carriers to submit bids into combinatorial auction is exponential in the number of individual lanes announced by shipper. Thus, carriers face the hard valuation problem to determine the bid price for interested packages, and also they make a hard decision on which packages should be bided for (N. An, et al., 2005). Moreover, the studying on competitive bidding strategies for carriers to submit the optimal bid price into combinatorial transportation auction to obtain the maximum expected profit has less attention so far.

In this paper, the authors focus on finding the optimal bid price for truckload carrier in combinatorial transportation auction with pattern of transportation service under different characteristic of competition. We employ a bid-to-cost ratio of carriers in Thailand to represent the behavior of bidding in freight transportation service market, and we use Monte Carlo method to generate random number for competitive behavior of competitor in the simulation. We, furthermore, apply the stochastic optimization model to acquire the optimal bid price for bidder to obtain the maximum payoff in the auction. The paper is organized as follows: Section 2 reviews related literatures. In section 3, we present the research methodology with model and solution algorithm. The result analysis and empirical study is discussed in Section 4, and finally section 5 concludes the results for this paper and proposes the suggestion for future research.

2. LITERATURE REVIEW

This section reviews the related literatures on land freight transportation overview (2.1), transportation service procurement (2.2), combinatorial transportation auction (2.3), competitive bidding strategy (2.4) and bidding strategy in combinatorial transportation auction (2.5).

2.1 Land Freight Transportation Overview

Land freight transportation by truck is one of the most practical in nationwide shipment because it is expedient, fast and flexible based on geographic and infrastructure constraint in many countries including Thailand. In motor truck transportation service industry, there are partial shippers (e.g., manufacturers and retailers) using their private fleets to distribute products to marketplaces, while a large number of shippers have already used third party logistics to transport products instead (Foster and Strasser 1991). This is because of expanding in the business including limited in-house capacity and cost management. For freight transportation service by truck, it is distinctive mainly to Truck Load (TL) and Less-than-Truckload (LTL) (Chen, 2003) in which TL represents direct operation. It transports full loads from an origin to a destination without any intermediated stop. For LTL, it means the consolidating and hauling multiple shipments in one truck on regular route basis (Caplice and Sheffi 2003). Thus, we study in this paper on TL operation since it is particularly sensitive on economies of scope in freight transportation service.

2.2 Transportation Service Procurement

In freight transportation service procurement, there are 2 main parties between shipper and carrier in this mechanism. The basic item of transportation service procurement is called a lane that specifies a unidirectional shipment from an origin to a destination. The shipper has initially used RFP to invite a set of carriers and provides useful information for them to participate in the auction. The fundamental information is based on price and period of contract (Sheffi 2004). This

process is similar to a simple first-price sealed-bid auction in which each carrier is able to submit his bids for interested items (Song and Regan 2003). In transportation service industry, carriers have realized the importance of economies of scope. They aim to have cost effectiveness in transportation network with minimum empty backhaul and repositioning cost. Carrier, therefore, could reduce cost of operation, while the result in turn also potentially lowers the shipper's cost for transportation service procurement (Caplice and Sheffi 2003). However, carriers engaging in RFP have to submit bids on individual lane separately, this format does not guarantee carriers for acquiring a cycle route or a complete set of individual lanes, and it may likely cause empty backhaul or repositioning cost in the transportation network (Chen 2003). Thus, the combinatorial auction has been studied in this area to overcome this problem recently.

2.3 Combinatorial Transportation Auction

There are many industries applying combinatorial auction to enhance the allocation efficiency in their businesses. For instance: telecommunication spectrum (Rothkopf, et al., 1998), airport timeslot (Rassenti, et al., 1982), trading financial securities (Srinivasan and Whinston 1998) including truckload transportation procurement. A lot of papers in combinatorial transportation auction (Song and Regan 2003; De Vries, et al., 2003; Sheffi 2004; Elmaghraby and Keskinocak 2004) are mentioned the definition of CA that carriers are allowed to submit multiple bids to auctioneer simultaneously in which one bid consists of a combination of individual lanes (package) and a price. Therefore, carriers joining in CA could place bids on several distinct lanes and potentially would receive the cycle route in transportation network as well as address the exposure problem to obtain more cost efficiency (Caplice and Sheffi 2003; Song and Regan 2003; Lee, et al., 2007). In addition, shipper is able to use CA to minimize the cost of transportation service procurement as well. Sears Logistics Services (SLS) was an example of shipper using CA that could save the cost for transportation service procurement over \$165 million per year (Ledyard 2002). Shippers can apply the optimization problem called winner determination problem that has been already studied to allocate the awarded bids to the winner with minimum cost of transportation service procurement (Caplice and Sheffi 2003; Song and Regan 2003). However, there is one issue that has not been discussed extensively. It is the bidding price for possible packages in combinatorial transportation auction. Because total number of all packages are exponential in the number of individual lanes proposed by shipper, thus carriers mostly face the hard valuation problem to determine bid price, and they also make a hard decision on which packages should be bided for (An, et al., 2005; Lee 2007). Moreover, the studying on pricing of possible packages by applying bidding strategies in combinatorial transportation auction has been less considered.

2.4 Competitive Bidding Strategy

Auction is one of the most successful applications in branch of such a game theory. It involves with how bidders decide how value to bid, and effect of bidding strategies of each bidder. For transportation service procurement auction, the term of auction applies in reverse auction between one shipper and several carriers. Each carrier joining in the auction would like to be a winner undoubtedly. Information of each carrier, therefore, is likely to be sensitive and unrevealed as a game of incomplete information called Bayesian game. Due to lack of information about the true valuation for packages of all competitors, thus the best strategy for bidder is a bid price that maximizes the expected payoff (Aliprantis and Chakrabarti, 2000). In reverse auction, the expected profit of bidder could be shown by *Expected Profit of Bidder* = $(\text{Bid Price} - \text{Cost}) \times \text{Probability of Winning with Bid Price}$ (Friedman 1955). The bidding strategy for bidder in the incomplete information game has the importance to determine how much to bid for so that bidder may obtain the maximum expected profit with the best solution. Friedman (1955) presented a bidding strategy for bidder to compete in the first-price sealed-bid auction. To create a bidding behavior of competitors, he applied the concept of the average bidder by combining all data of competitors to obtain one distribution function with competitors' bid over cost as random variable. He then used stochastic optimization model to determine where the optimum bid was. Finally, bidder could submit a sealed-bid in competitive bidding with optimal solution in order to obtain the maximum expected payoff. In addition, the probability of being lower than competitors by bidding with any bid-to-cost ratio was the area to the right on competitors' distribution curve.

Sugrue (1982) described how to find the actual optimal bid price with Friedman's model. This model assumed that the cost of performing the operation was known prior to submitting the bid into the auction to get the maximum expected value. Loannou and Lev (1993) studied the average-bid method comparing with the low-bid method by which both methods based on the same assumption as Friedman's model. Each bid of competitor was standardized by using bidder's cost to be a bid-to-cost ratio in order to eliminate the impact of the project size to a bid-to-cost ratio in the research.

2.5 Bidding Strategy in Combinatorial Transportation Auction

For transportation service procurement in combinatorial auction, there is a little study in price-bidding strategy on this area. We, therefore, summarize the details as follows: Song and Regan (2002) studied combinatorial transportation auction in the carrier perspective and proposed the formula to calculate the bidding price for new lane; $p = c_i^*(1+\beta) + c_j^*\alpha_j$, where c_i was cost of servicing new lane(s) in bid; c_j was cost of the empty backhaul. They used distance of servicing to calculate the cost directly because it was proportional to mileage. While β was average profit margin for carrier which ranged during 4%-6%, and α_j was the carrier's risk of not acquiring those empty lane which was uniformly distributed on interval [0, 1]. An, et al., (2005) researched on bidding strategies into question which packages should be bided and how much to bid for. They then applied a fixed profit margin to value bid price. These two papers neglect the interaction of the competition among carriers in the auction. Ergun, et al., (2007) presented the bidding strategy by which was a stochastic bid price optimization problem for simultaneous transportation auction. They focused on both new proposed lane and existing lane, and they considered other carriers' competition. In the model, they used the lowest bid price of competitors for each lane denoted as random variable with uniform distribution function on interval $[l_i, u_i]$ for lane i ; l_i was bidding on lane i which guaranteed winning the lane, while u_i was bidding on lane i which guaranteed losing the lane. The objective of this research was to maximize the expected profit of carrier with optimal bid price on the lanes being auctioned.

3. THE MODEL AND SOLUTION ALGORITHM

In this section, we start describing the respondent and questionnaire for finding relationship among interested factors in this paper. We then explain the description of the model, indicate assumptions, and present the notation. Next, we introduce the model formulation in combinatorial transportation auction, and we outline our solution algorithm in order to find the optimal solution for combinatorial auction in the incomplete information game.

3.1 Sample and Questionnaire

We design to have in-depth interview with carriers who provide freight service in many industries on different size of revenue in Thailand. First, the pre-questionnaire is used with some respondents to test the feedback and to check whether it is compatible with our research objective. Then the post-questionnaire will be employed to collect the data with many respondents by in-depth interview. For the objective of our questionnaire, we focus on finding the relationship among interested factors how they impact on a bid-to-cost ratio of carrier in combinatorial auction. The interested factors in this paper include a decrease ratio of pre-empty backhaul, a pre-empty backhaul to new lane distance ratio, number of competitors, and size of project. Finally, the relationship of these factors after testing will help us to find the optimal bid price of carrier in the competition afterwards.

3.2 Description of Model

In this study, we present the bidding strategy in a first-price sealed-bid combinatorial transportation auction for truckload service operation. This model focuses on the bid price generation problem of bidder with the interaction among carriers to interested package. For interested package, we consider both new lanes proposed by shipper and current servicing lanes of carrier simultaneously in order to meet economies of scope. In our model, we introduce a stochastic optimization problem to find the optimal solution for incomplete information game.

Specifically, we use a bid-to-cost ratio of competitors as random variable generated by Monte Carlo method to represent the competition behavior in combinatorial transportation auction.

3.3 Assumptions

We assume the details in this paper as the following:

- Bidder and Competitor are risk neutral.
- Bidder and Competitor do not have collusion.
- Bidder and Competitor have incomplete information.
- Bidder and Competitor would bid on combinatorial auction to have more network efficiency.
- Cost of freight transportation service is proportional to servicing distance only.
- Unit Cost of freight transportation service for carriers is the same.

3.4 Notations

We summarize all notations in our model formulation as follows:

Decision Variable

x_{ij} is the bid-to-cost ratio of carrier i for package j .

Result Variables

$\pi_{ij}(x_{ij})$ is the expected profit with the bid-to-cost ratio of carrier i for package j .

b_{ij} is the bid price of carrier i for package j .

$\Pr_{ij}(x_{ij})$ is the probability of winning with the bid-to-cost ratio of carrier i (x_{ij}) against the competitor for package j .

Intermediate Variables

mc_{ij} is the marginal cost of carrier i for package j .

oc_j is the operating cost for package j .

μ_{ij} is the pre-empty backhaul to new lane distance ratio of carrier i with package j .

γ_{ij} is the decrease ratio of pre-empty backhaul of carrier i with package j .

n is a number of competitors.

s_j is a size of project for package j ($s_j = 1$ if $l_j = 150$ km.)

l_j is a new lane distance for package j .

$lpos_{ij}$ is a post-empty backhaul distance of carrier i for package j .

$lpre_{ij}$ is a pre-empty backhaul distance of carrier i for package j .

Parameter and Data

a_j is the shortest distance for a straight direction from an origin to a destination point of package j .

α is a step size.

ϕ_f is a unit cost of full truck load servicing.

ϕ_e is a unit cost of empty backhaul.

Sets

I is set of carriers.

J is set of possible packages.

3.5 Model Formulation

We present the bidding strategy formulation with stochastic optimization model for carrier in combinatorial transportation auction as described in the following:

$$\text{Max } \pi_{ij}(x_{ij}) = (b_{ij} - mc_{ij}) * \text{Pr}_{ij}(x_{ij}) \quad (1)$$

Subject to:

$$\mu_{ij} \leq \frac{1}{\gamma_{ij}} \quad \forall i \in I, \forall j \in J \quad (2)$$

$$\mu_{ij} \geq \frac{a_j}{l_j * (2 - \gamma_{ij})} \quad \forall i \in I, \forall j \in J \quad (3)$$

$$0.2 \leq \gamma_{ij} \leq 1 \quad \forall i \in I, \forall j \in J \quad (4)$$

, where

$$x_{ij} = x_{ij} + \alpha \quad (5)$$

$$b_{ij} = oc_j * x_{ij} \quad (6)$$

$$oc_j = \phi_f * l_j \quad (7)$$

$$mc_{ij} = \phi_f * l_j + \phi_e * (l_{pos_{ij}} - l_{pre_{ij}}) \quad (8)$$

$$x_{ij} = f(\mu_{ij}, \gamma_{ij}, n, s_j) \quad (9)$$

$$\mu_{ij} = \frac{l_{pre_{ij}}}{l_j} \quad (10)$$

$$\gamma_{ij} = \frac{(l_{pre_{ij}} - l_{pos_{ij}})}{l_{pre_{ij}}} \quad (11)$$

For equation (1), we present a stochastic optimization model to obtain the maximum expected profit with the optimal bid-to-cost ratio of bidder for combinatorial auction. Because of incomplete information game, thus, we apply the Monte Carlo method for bidder to randomize μ_{ij} and γ_{ij} of competitor in package j under constraints (2), (3) and (4). In constraint (2), we apply this constraint to find the possible maximum μ_{ij} of competitor in package j whereas the possible minimum μ_{ij} of competitor in package j is acquired by constraint (3). To understand the economies of scope, we assume that all carriers would submit bid to reduce the existing empty backhaul (γ_{ij}) on the interval [0.2, 1] regarding constraint (4). Furthermore, we could describe the details of constraints (2) and (3) as below.

For equation (5), we use the step size (α) to increase value of a bid-to-cost ratio of bidder iteratively so that we could simulate how a bid-to-cost ratio of bidder does impact to the competitive bidding with expected profit and probability of winning. In addition, we could evaluate the bid price of carrier (b_{ij}) to package j with operating cost and a bid-to-cost ratio of carrier by equation (6). The equation (7) presents how to calculate the operating cost (oc_j) in which it is proportional to new servicing distance (l_j) of package j . Moreover, the marginal cost (mc_{ij}) that indicates the actual cost of carrier for servicing in package j can be expressed by equation (8). It involves with new lane distance including pre-empty backhaul ($l_{pre_{ij}}$) and post-empty backhaul distance ($l_{pos_{ij}}$) in transportation network of carrier. In equation (9), we use this equation to find the average bid-to-cost ratio of carrier in the transportation market with μ_{ij} , γ_{ij} , n and s_j for package j . In equations (10) and (11), we introduce the formula both μ_{ij} and γ_{ij} respectively in order to represent the transportation network of carrier with package j .

Constraint (2)

Pre-Empty Backhaul Distance \leq New Lane + Post-Empty Backhaul Distance.

$$lpre_{ij} \leq l_j + lpos_{ij}.$$

$$\mu_{ij} * l_j \leq l_j + lpre_{ij} * (1 - \gamma_{ij}).$$

$$\mu_{ij} * l_j \leq l_j + \mu_{ij} * l_j * (1 - \gamma_{ij}).$$

$$\mu_{ij} \leq 1 + \mu_{ij} * (1 - \gamma_{ij}).$$

$$\mu_{ij} \leq 1 + \mu_{ij} - \mu_{ij} \gamma_{ij}.$$

$$\mu_{ij} \leq \frac{1}{\gamma_{ij}}.$$

Constraint (3)

Pre-Empty Backhaul Distance + Post-Empty Backhaul Distance \geq Shortest Distance (New lane).

$$\mu_{ij} * l_j + \mu_{ij} * l_j * (1 - \gamma_{ij}) \geq a_j.$$

$$\mu_{ij} + \mu_{ij} (1 - \gamma_{ij}) \geq \frac{a_j}{l_j}.$$

$$\mu_{ij} (2 - \gamma_{ij}) \geq \frac{a_j}{l_j}.$$

$$\mu_{ij} \geq \frac{a_j}{l_j * (2 - \gamma_{ij})}.$$

3.6 Solution Algorithm

For simulation with incomplete information game, we assume that bidder and competitor who are carriers do not know information among each other. Thus, we employ a Monte Carlo method in the algorithm for bidder to randomize value both μ_{ij} and γ_{ij} of competitor in order to represent the transportation network of competitor including the competitive behavior in the combinatorial auction. To find all feasible bid-to-cost ratios of competitor in the incomplete information game, at first we have to acquire all possible values both μ_{ij} and γ_{ij} of competitor to package j . Therefore, we initially randomize γ_{ij} of competitor as an independent continuous random variable which is uniformly distributed on an interval [0.2,1] under constraint (4). We then use constraint (2) and constraint (3) as described above to find the possible maximum μ_{ij} and minimum μ_{ij} of competitor to package j with uniformly randomized γ_{ij} . Next, we randomize μ_{ij} on interval [minimum μ_{ij} , maximum μ_{ij}] of competitor which is distributed uniformly as an independent continuous random variable with randomized γ_{ij} . With all possible values both μ_{ij} and γ_{ij} of competitor randomized to package j , we input all both values into equation (9) with number of competitors (n) and size of project j (s_j) to find all possible bid-to-cost ratios of competitor (x_{ij}) in the bidding game. Specifically, we can use equation (6) with each value of x_{ij} of competitor and operating cost of package j (oc_j) received from equation (7) to acquire all feasible bid prices of competitor (b_{ij}).

For the competition with competitor, bidder initiates a minimum bid-to-cost ratio firstly. Bidder then submits the initial bid-to-cost ratio into the auction against all feasible bid-to-cost ratios of competitor. In this step, bidder could acquire the probability of winning, $Pr_{ij}(x_{ij})$, with this initial value. Furthermore, bidder could find the expected profit ($\pi_{ij}(x_{ij})$) in package j with initial bid price of bidder by equation (1). To find the maximum expected profit with the optimal solution (x_{ij}^*), the solution algorithm employs a step size (α) to increase value of a bid-to-cost ratio of bidder with equation (5) iteratively. The results of simulation will provide the expected profit and probability of winning with each of bid-to-cost ratio and bid price of bidder. Thus, the solution algorithm could

definitely select the optimal bid-to-cost ratio in which presents the best solution including maximum expected profit and probability of winning for bidder in the combinatorial auction. The solution algorithm can be shown in Figure 1.

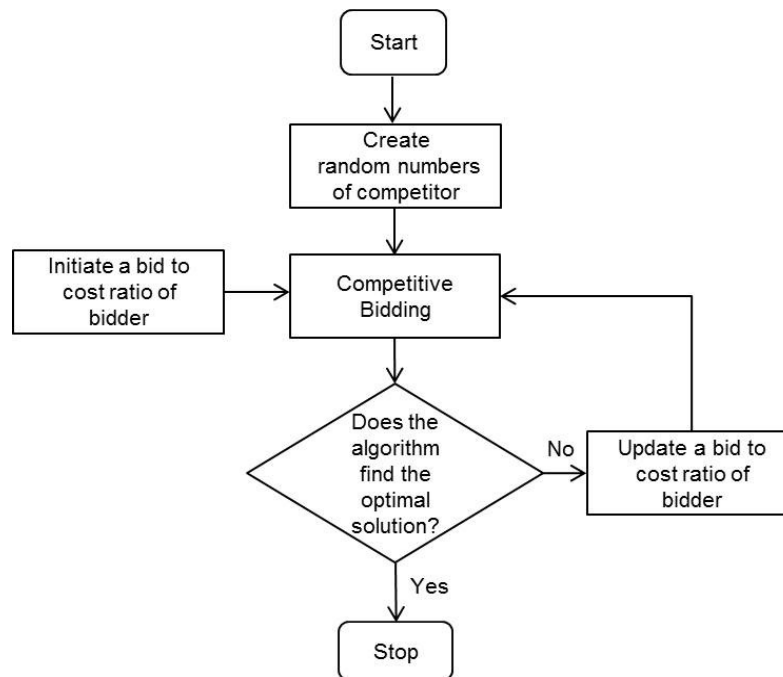


FIGURE 1: Solution Algorithm

4. RESULT ANALYSIS

In this section, we have two parts. For the first part, we summarize characteristics of respondents and factors, and we use statistical analysis to find the regression model as well as test hypotheses whether interested factors impact on a bid-to-cost ratio significantly. We then create a bidding game for bidder and competitor in the second part. To compete between bidder and competitor in the incomplete information game, we use Monte Carlo method to create the bidding behavior of competitor. In addition, we employ the solution algorithm with stochastic bidding model to find the optimal solution for bidder. In this part, we can find the optimal bid price for bidder to submit into the auction, and obtain the maximum expected profit including probability of winning.

4.1 Respondent and Factor Characteristics

The respondents surveyed in this research are truck carriers who provide freight service in Thailand. About half of the total respondents have income between 20-100 million baht per year. For majority of respondents (37%), they are facing the problem of empty backhaul per total haul distance over 40%. Moreover, most 65% of respondents confront the empty backhaul (EBH) experience above 25% of EBH per total haul distance.

This survey shows that average of EBH per total haul distance is about 30%. In addition, construction, container, agriculture, consumer and electronic product are the top five of business types that respondents provide freight service to these customers (Table 1). This study also proposes hypotheses to test the relationship between a bid-to-cost ratio of carrier (x) and interested factors (μ, γ, n, s) as follows:

Hypothesis 1: A number of competitors (n) do not impact on a bid-to-cost in combinatorial transportation auction.

Hypothesis 2: A size of project (s) does not impact on a bid-to-cost ratio in combinatorial transportation auction.

Hypothesis 3: A pre-empty backhaul to new lane distance ratio (μ) does not impact on a bid-to-cost ratio in combinatorial auction.

Hypothesis 4: A decrease ratio of pre-empty backhaul (γ) does not impact on a bid-to-cost ratio in combinatorial auction.

Hypothesis 5: A pattern of transportation service ($\mu\gamma$) does not impact on a bid-to-cost ratio in combinatorial auction.

Hypothesis 6: A pre-empty backhaul to new lane distance ratio with number of competitors (μn) does not impact on a bid-to-cost ratio in combinatorial auction.

TABLE 1: Characteristic Respondents

Characteristics (n=50)	M	SD	Frequency	Percentage
Income Per-Year	474.9	963.2		
Below 20 Million Baht			7	0.14
20-100 Million Baht			21	0.42
100-500 Million Baht			12	0.24
Above 500 Million Baht			10	0.20
EBH per Total Distance	29%	18%		
Below 10%			6	0.18
10%-25%			6	0.18
25%-40%			9	0.27
Above 40%			12	0.37
Type of Business				
Agriculture			18	0.15
Construction			29	0.24
Energy			6	0.05
Consumer Product			18	0.15
Electronic Part			15	0.13
Container			22	0.18
Others			12	0.10

M = Mean, **SD** = Standard Deviation.

To find relationship of each independent variable to a bid-to-cost ratio of carrier, we use the statistical analysis by t-test to execute the data with each independent variable. The result of this research shows that a number of competitors (n), a pre-empty backhaul to new lane distance ratio (μ), a pattern of transportation service ($\mu\gamma$), and a pre-empty backhaul to new lane distance ratio with number of competitors (μn) do impact on a bid-to-cost ratio of carrier in combinatorial transportation auction significantly at the 0.05 level (Table 2). The coefficient and standard error of each independent variable are shown in Table 2 as well. Specifically, all independent variables tested by ANOVA are revealed that they all do impact on dependent variable significantly at the 0.05 level (Table 3). From testing by statistical analysis, we can present the regression model for the average bid-to-cost ratio of carrier in combinatorial transportation auction in Thailand defined previously in equation (9) with equation (12) instead as follows:

$$x_{ij} = 1.385 - 0.023n - 0.005s_j + 0.009\gamma_{ij} + (0.15 - 0.743\gamma_{ij} - 0.007n)\mu_{ij}. \quad (12)$$

The results of regression model can explain that the bidding price of competitive auction to package j with a large number of competitors (n) will be lower compared with a small number of competitors. Because a large number of competitors represent the high competitive situation in combinatorial auction, thus, carrier understands the condition and accepts to decrease a bid-to-

cost ratio to compete in the competition market inevitably. While a pre-empty backhaul to new lane distance ratio (μ) does impact positively to the bid-to-cost ratio of carrier. It indicates that carrier considers submitting a higher bid-to-cost ratio when new lane distance decreases with constant distance of pre-empty backhaul. In addition, a bid-to-cost ratio of carrier in the market has decreased obviously when a value of pattern of transportation service ($\mu\gamma$) increases. The maximum value of $\mu\gamma$ is equal 1 regarding equation (2). For example: $\mu_{11}=1$, $\gamma_{11}=1$, $\mu_{11}\gamma_{11}=1$, $l_i=150$, it presents that the new lane for package1 proposed by shipper at 150km matches with the existing empty backhaul of carrier1 completely ($\gamma_{11}=1$). A carrier1 can eliminate the existing empty backhaul with package 1 totally ($lpos_{11}=0$) and enhance transportation network efficiency.

Because the marginal cost of carrier1 (mc_{11}) in this package could be low due to no post-empty backhaul ($lpos_{11}=0$) regarding equation (8). Thus, carrier1 has the competitive advantage to compete with competitor, and he could submit bid price with the low bid-to-cost ratio into the auction. On the other hand, if carrier1 has no competitive advantage in package1, for example: $\mu_{11}=1$, $\gamma_{11}=0.2$, $\mu_{11}\gamma_{11}=0.2$, $l_i=150$, the new lane in package1 is able to eliminate the empty backhaul of carrier1 only at 20% ($\gamma_{11}=0.2$, $lpos_{11}=120$). The marginal cost (mc_{11}) in this example should be higher than the previous one. Therefore, in this case carrier1 has to submit the bid price with the higher bid-to-cost ratio to cover more marginal cost for package1 into the auction necessarily.

TABLE 2: Statistical Analysis

Independent Variable	Coefficients	Standard Error	t-Stat	P-value	Hypothesis
<i>Intercept</i>	1.385	0.0253	54.840	0.000	-
<i>n</i>	-0.023	0.0052	-4.389	0.000*	Rejected H1
<i>s</i>	-0.005	0.0032	-1.471	0.141	Accepted H2
μ	0.150	0.0107	0.007	0.000*	Rejected H3
γ	0.009	0.0234	0.371	0.711	Accepted H4
$\mu\gamma$	-0.743	0.0270	-27.547	0.000*	Rejected H5
μn	-0.007	0.0026	-2.717	0.007*	Rejected H6

Note: *significant at the 0.05 level.

TABLE 3: Regression Model

Research Statistics	
Multiple R	0.594
R Square	0.353
Adjusted R Square	0.352
Standard Error	0.309
Observations	2394

ANOVA	Df	SS	MS	F	Significance F
Regression	6	125.191	20.865	217.3107	0.000*
Residual	2387	229.188	0.096		
Total	2393	354.378			

Note: *significant at the 0.05 level.

4.2 Empirical Study

To find the optimal bid price, we simulate the bidding game in combinatorial auction with incomplete information between bidder and competitor who are truck carrier. Because bidder does not know any information of competitor, thus bidder has to evaluate the all feasible bid-to-

cost ratios of competitor with any possible μ and γ of competitor. The solution algorithm uses the Monte Carlo method to generate random number between μ and γ of competitor according to constraints (2), (3) and (4). With number of competitors (n), size of project (s), any possible μ , and γ of competitor randomized, then bidder could evaluate the all feasible bid-to-cost ratios of competitor regarding equation (12). To find probability of winning with bidder's bid, we consider the bid-to-cost ratio of bidder against all randomized bid-to-cost ratios of competitor by one to all to estimate the probability of winning. For example: There are 10 random numbers of competitor as follows: 0.95, 0.97, 0.98, 0.99, 1.01, 1.02, 1.03, 1.05, 1.10, 1.15; Then we input 1.0 as a bid-to-cost ratio of bidder. Thus, the probability of winning with bidder's bid should be 60%. Specifically, we use the solution algorithm with stochastic optimization problem to find the optimal bid-to-cost of bidder in which reaches the maximum payoff for the competition as described in section 3.6.

In Figure 2 as our simulation in example 1, shipper who is a manufacturer announces to invite truck carriers (10-wheeled truck) to join into the bidding. Shipper would like carrier to transport the product with full truckload freight service only 1 lane (one package) from location A (Factory) to location B (Marketplace) directly about 150 km ($l_1=150$, $a_1=150$, $s_1=1$). As defined, there are 2 carriers joining in this auction between bidder and one competitor ($n=1$). For current transportation network of bidder, bidder normally provides the freight service with only one way from location B to location A. By this reason, bidder then has the empty backhaul problem inevitably ($l_{pre1}=150$). However, the new lane proposed by shipper ($l_1=150$, $\mu_{11}=150/150=1$) in Figure 2 matches with the existing empty backhaul of bidder completely and eliminates this empty backhaul problem ($l_{pos1}=0$, $\gamma_{11}= (150-0)/150=1$). Therefore, bidder then gains the competitive advantage from this package since bidder has the low marginal cost. In equation (8), the marginal cost of bidder is at 225 baht; $mc_{11}= (7.5*150) + 6*(0-150)$. Whereas, operating cost which is proportional to new lane distance of package 1 equals 1,125 baht; $oc_1= 7.5*150$. Thus, bidder could submit the low bid price to gain high benefit both expected profit and probability of winning because of having low marginal cost. Moreover, bidder is able to eliminate the empty backhaul problem and improve his transportation network with package 1 efficiently.

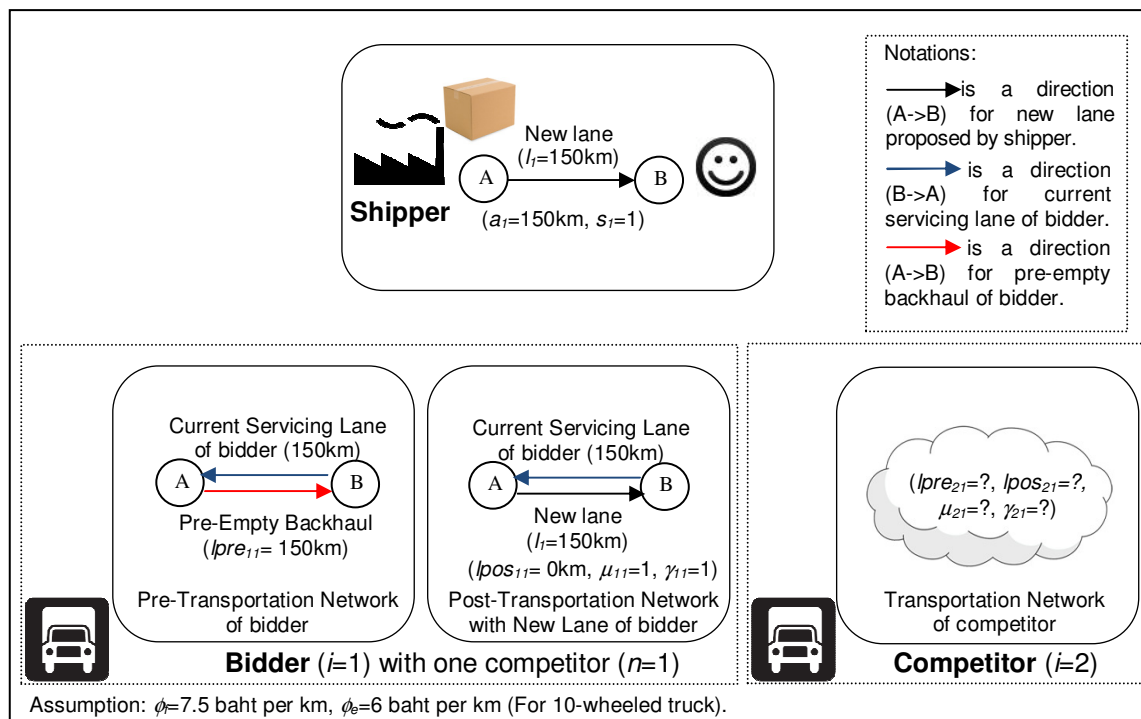


FIGURE 2: A Bidding Simulation for Incomplete Information Game (Example 1)

However, bidder does not know any information about existing transportation network of competitor regarding incomplete information game. In Figure 2, we, thus, introduce a cloud in competitor's side to represent the unknown information of competitor ($lpre_{21}=?$, $lpos_{21}=?$, $\mu_{21}=?$, $\gamma_{21}=?$). Therefore, bidder initially has to find any possible transportation network of competitor with package 1 indicated by μ_{21} and γ_{21} . Under constraint (2), constraint (3) with $a_1/l_1=1$ and constraint (4), the possible random number both μ_{21} and γ_{21} of competitor in package 1 can be generated by Monte Carlo method. The all possible values both μ_{21} and γ_{21} obtained by randomization as solution algorithm are plotted on the graph as shown in Figure 3.

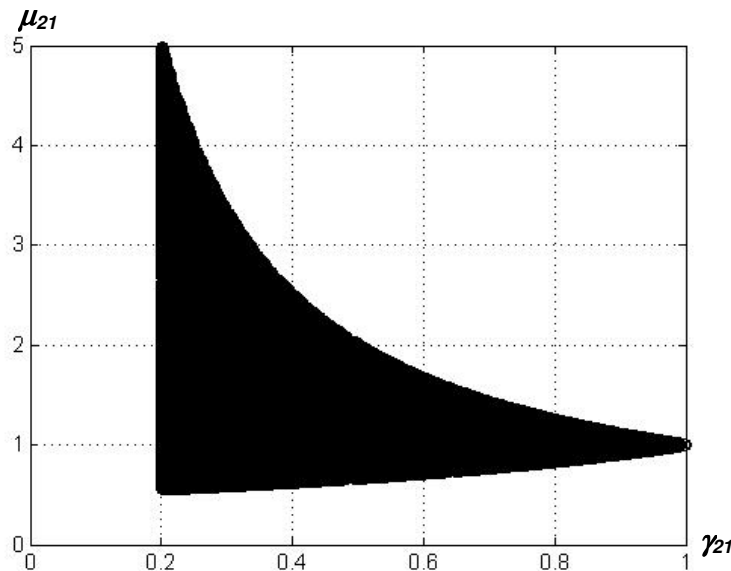


FIGURE 3: The Possible Transportation Network of Competitor (μ_{21} and γ_{21}) with new lane ($a_1/l_1=1$)

To acquire all feasible bid-to-cost ratios of competitor for package 1 (x_{21}), we input each value both μ_{21} and γ_{21} randomized with $n=1$ and $s_1=1$ into equation (12). The result with all feasible bid-to-cost ratios of competitor under the possible transportation network of competitor is presented in Figure 4. For the competition, at first we start using the initial bid-to-cost ratio of bidder from a minimum possible bid-to-cost ratio of competitor. Then we do simulate a bid-to-cost ratio of bidder (x_{11}) against all feasible bid-to-cost ratios of competitor. The probability of winning with a bid-to-cost ratio of bidder could be acquired from this step. In addition, we use step size ($\alpha=0.001$) in equation (5) to increase a bid-to-cost ratio of bidder to compete with all possible bid-to-cost ratios of competitor on and on. The results of bidder for each bid-to-cost ratio (x_{11}) to compete with competitor can be shown in Table 4.

In Table 4, we present the simulated bids that show the outcome of bidder to package 1 both expected profit ($\pi_{11}(x_{11})$) and probability of winning ($Pr_{11}(x_{11})$) for each value of x_{11} including bid price (b_{11}). Regarding the stochastic optimization model in equation (1), it will select the bid-to-cost ratio of bidder that provides the maximum expected profit. While the solution algorithm will be stopped until they find the optimal solution as procedure. Thus, the optimal bid-to-cost ratio of bidder in the combinatorial auction (x_{11}^*) definitely is 0.772. While the optimal bid price of bidder to submit into the competition market equals 868.50 baht. In addition, the maximum expected profit with the best solution ($\pi_{11}(x_{11}^*)$) is at 638.1 baht. Besides, the expected profit per marginal cost ($\pi_{11}(x_{11}^*)/mc_{11}$) and probability of winning ($Pr_{11}(x_{11}^*)$) with optimal solution are at 283.6%, 99.16% respectively. Specifically, the result of simulation shows that bidder who has the competitive advantage in this game can obtain the expected profit per marginal cost more around 0.6% comparing the optimal solution with average bid-to-cost of bidder in the market (average $x_{11}=0.766$ with $\gamma_{11}=1$, $\mu_{11}=1$, $n=1$, $s_1=1$; $\pi_{11}(0.766)/mc_{11}=283\%$; average $b_{11}=861.75$)

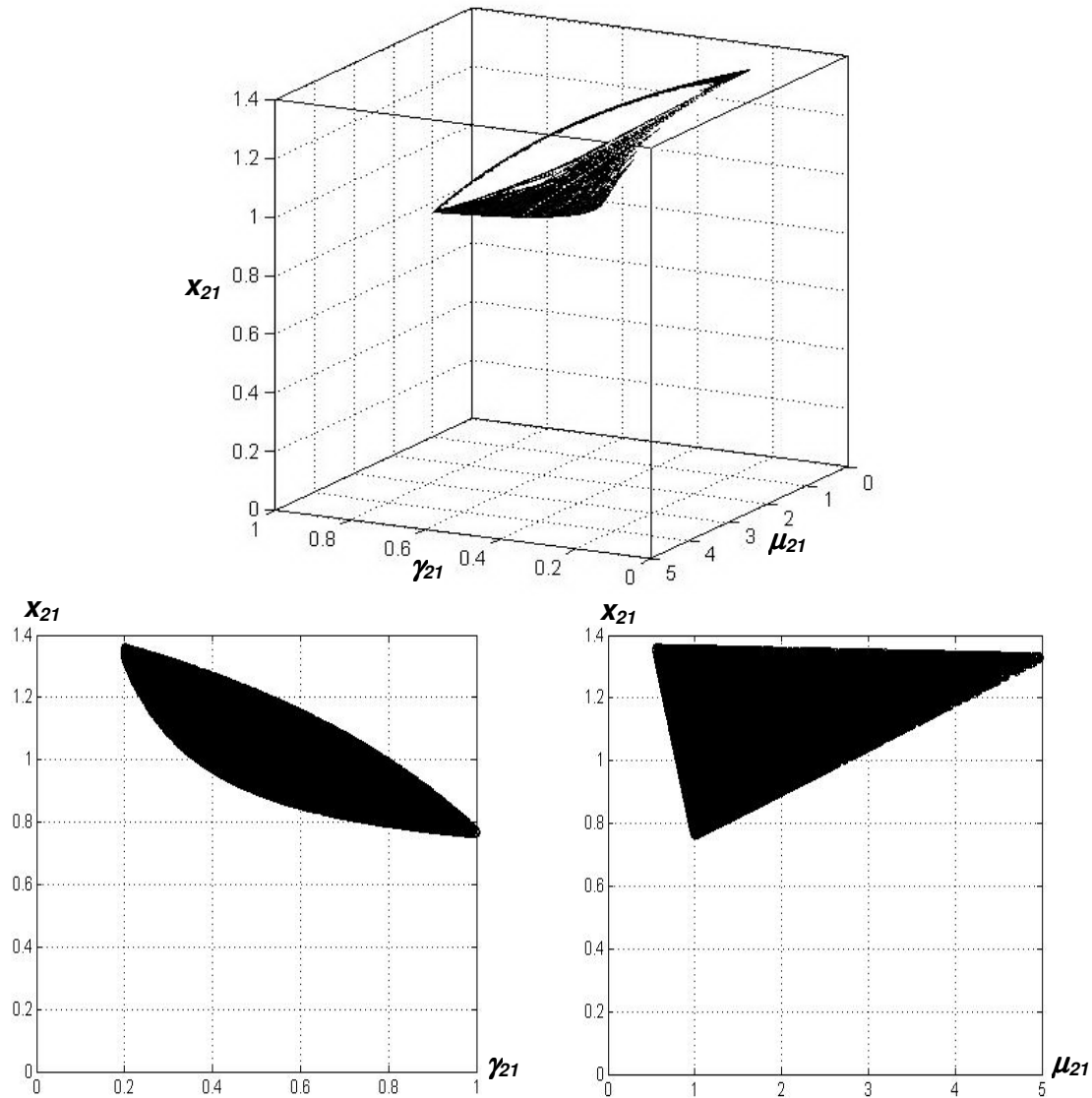


FIGURE 4: The Feasible Bid-to-Cost Ratios of Competitor (x_{21}) at $a_1/l_1=1$, $n=1$, $s_1=1$

TABLE 4: Simulated Bids of Bidder in Example 1 ($a_1/l_1=1$, $n=1$, $s_1=1$)

A Bid-to-Cost Ratio	Bid Price (Baht)	Marginal Cost (Baht)	Probability of Winning	Expected Profit (Baht)
0.765	860.63	225	100.0%	635.63
0.766	861.75	225	100.0%	636.75
0.767	862.88	225	99.8%	636.41
0.768	864.00	225	99.70%	637.08
0.769	865.13	225	99.59%	637.50
0.770	866.25	225	99.44%	637.66
0.771	867.38	225	99.31%	637.94
0.772	868.50	225	99.16%	638.10
0.773	869.63	225	98.98%	638.05
0.774	870.75	225	98.80%	638.00
0.775	871.88	225	98.61%	637.88
0.776	873.00	225	98.40%	637.63
0.777	874.13	225	98.18%	637.31

Assumption: $\phi_1=7.5$ baht per km, $\phi_6=6$ baht per km (For 10-wheeled truck).

In addition, we introduce another bidding game for bidder (Example 2) as shown in Figure 5. There are 2 carriers joining in this game between bidder and one competitor ($n=1$). Shipper announces to procure transportation service only 1 lane (one package) from location A (Factory) to location B (Marketplace) directly at 150km ($l_i=150$, $a_i=150$, $s_i=1$) as the same details in example 1. For the current transportation network of bidder, bidder transports the product from location C to location A in one way only at 150km. Thus, bidder faces the empty backhaul problem from location A to location C ($l_{pre_i}=150$). While the new lane proposed by shipper in package 1 ($l_i=150$, $\mu_{1i}=150/150=1$) as shown in Figure 5 could reduce the existing empty backhaul of bidder only 20% ($l_{pos_{1i}}=120$, $\gamma_{1i}=(150-120)/150=0.2$). Regarding equation (8), the marginal cost of bidder equals 945 baht ($mc_{1i}=7.5*150+6*(120-150)$) in which is higher than in the example 1 particularly. For operating cost of bidder, it is similar to the example 1 because of the same distance ($oc_{1i}=1,125$). Therefore, bidder in this example 2 has no competitive advantage and could not submit the low bid price into the combinatorial auction due to high marginal cost.

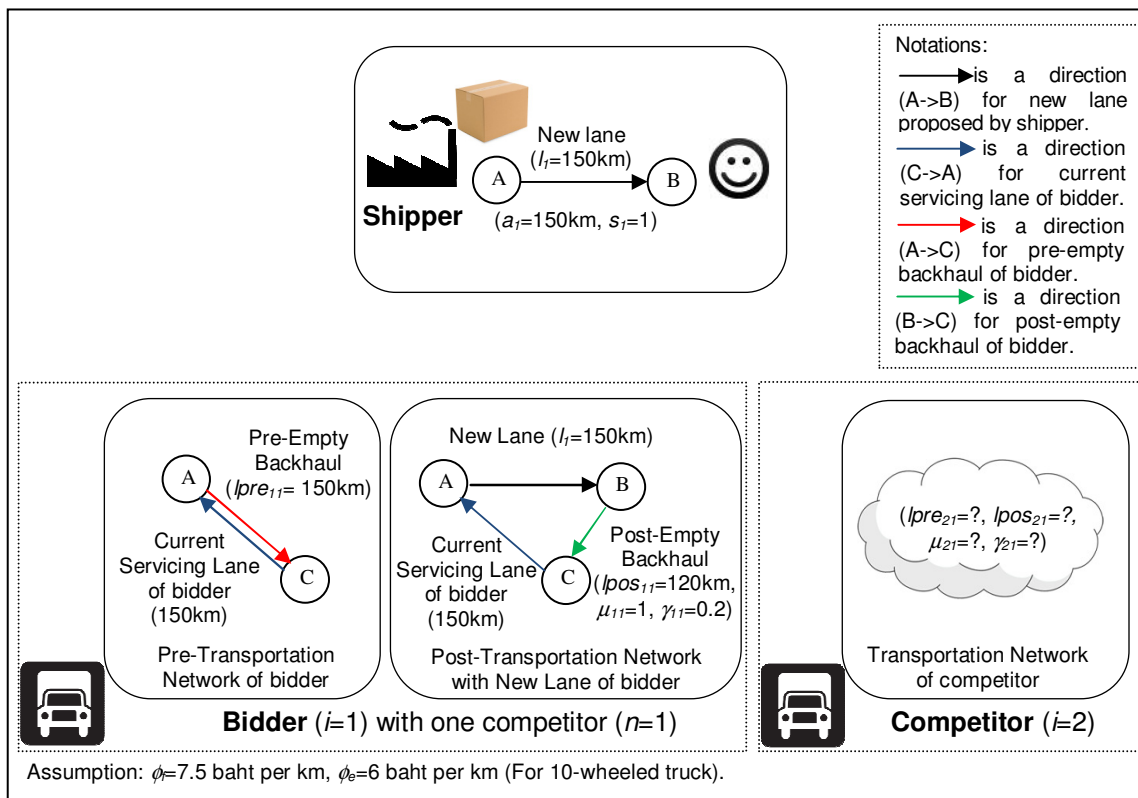


FIGURE 5: A Bidding Simulation for Incomplete Information Game (Example 2)

To find the optimal bid of bidder in this auction, because bidder does not know any information of competitor as incomplete information game, so we use the solution algorithm to generate a randomized number both γ_{2i} and μ_{2i} subject to constraints (2), (3), and (4). Under similar environment of competition to example 1 ($a_i/l_i=1$, $n=1$, $s_i=1$), thus, the results of possible transportation network with package 1 of competitor and the competitor's bidding strategy in this simulation are shown as the same in Figure 3 and Figure 4 respectively. After we have any possible bid-to-cost ratios of competitor regarding equation (12), we then do simulate a bid-to-cost ratio of bidder against all feasible bid-to-cost ratios of competitor according to the solution algorithm.

In Table 5, we finally show the simulated bids of bidder in example 2 with expected profit ($\pi_{1i}(x_{1i})$) and probability of winning ($Pr_{1i}(x_{1i})$) for each bid-to-cost ratio of bidder (x_{1i}). Regarding the

stochastic optimization model, it presents that the optimal bid-to-cost ratio of bidder in the combinatorial auction (x_{11}) is 1.058 certainly. The optimal bid price equals 1,190.25 baht. In addition, the maximum expected profit with the optimal solution ($\pi_{11}(x_{11})$) is at 97.46 baht. In Table 5, it introduces that the expected profit per marginal cost ($\pi_{11}(x_{11})/mc_{11}$) and probability of winning ($Pr_{11}(x_{11})$) with optimal solution are at 10.31%, and 39.74% respectively. Even bidder who has the competitive disadvantage in this game gains $\pi_{11}(x_{11})/mc_{11}$ only 10.31% with $Pr_{11}(x_{11})$ at 39.74%. However, the optimal solution obtained from this solution algorithm can enhance the expected profit per marginal cost and probability of winning of bidder increasingly over 10.31% and 39.72% respectively comparing with average bid-to-cost of bidder in the transportation market (average $x_{11}=1.353$; $\mu_{11}=1$, $\gamma_{11}=0.2$, $n=1$, $s_1=1$; $\pi_{11}(1.353)/mc_{11}=0\%$, $Pr_{11}(1.353)=0.02\%$; average $b_{11}=1,522.12$).

TABLE 5: Simulated Bids of Bidder in Example 2 ($a_1/l_1=1$, $n=1$, $s_1=1$)

A Bid-to-Cost Ratio	Bid Price (Baht)	Marginal Cost (Baht)	Probability of Winning	Expected Profit (Baht)
1.050	1181.25	945.00	41.21%	97.359
1.051	1182.38	945.00	41.02%	97.371
1.052	1183.50	945.00	40.84%	97.403
1.053	1184.63	945.00	40.66%	97.432
1.054	1185.75	945.00	40.48%	97.456
1.055	1186.88	945.00	40.29%	97.451
1.056	1188.00	945.00	40.09%	97.419
1.057	1189.13	945.00	39.91%	97.430
1.058	1190.25	945.00	39.74%	97.462
1.059	1191.38	945.00	39.55%	97.441
1.060	1192.50	945.00	39.35%	97.391
1.061	1193.63	945.00	39.17%	97.386
1.062	1194.75	945.00	38.99%	97.378
1.063	1195.88	945.00	38.81%	97.365
1.064	1197.00	945.00	38.62%	97.322

Assumption: $\phi=7.5$ baht per km, $\phi_e=6$ baht per km (For 10-wheeled truck).

From the empirical study, we summarize that carrier who has either competitive advantage or competitive disadvantage on new package proposed by shipper can gain more expected profit from our optimal solution compared with the average bid price in transportation market. While in turn it also shows that shipper potentially receives the benefits from our solution algorithm in combinatorial transportation auction. Shipper could lower the cost of transportation service procurement greatly when carrier has the competitive advantage with new package. Because of carrier's low marginal cost, thus, carrier is able to submit the low bid with high expected profit. For example 1, bidder could submit the optimal bid at 868.5 baht that is lower than operating cost of new lane around 256.5 baht. Even the shipper's cost for procurement with optimal bid of bidder regarding the solution algorithm is likely higher than the average bid price of bidder in transportation market (861.75 baht) around 0.78%. However, shipper gains fully benefits with the optimal bid of bidder in which lowers shipper's cost for transportation service procurement by 22.8% of operating cost.

For carrier who has the competitive disadvantage with high marginal cost, due to carrier has to take a hard effort to compete into the auction considerably regarding the solution algorithm. Therefore, carrier would submit the optimal bid price that is less than the average bid price in transportation market. By this reason, shipper could decrease the cost of transportation service procurement also. For example 2, bidder would submit the optimal bid price at 1,190.25 baht that is lower than the average bid price of bidder in transportation market (1,522.12 baht). Thus, shipper potentially obtains the benefit to reduce the cost of transportation service procurement with optimal bid of bidder around 21.8% of average bid price in transportation market.

5. CONCLUSION AND FUTURE RESEARCH

For this paper, we propose the bidding strategies for carrier with interaction between bidder and competitor in order to find the optimal bid price for bidder in combinatorial transportation auction. First, the study finds the relationship among involved factors in the regression model to a bid-to-cost ratio of carrier in Thailand by using statistics analysis. The result analysis shows that a pattern of transportation service, a number of competitors, a pre-empty backhaul to new lane distance ratio, and a pre-empty backhaul to new lane distance ratio with number of competitors do impact on a bid-to-cost ratio of carriers in Thailand significantly. A bid-to-cost ratio of carrier has been dropped obviously when a value of pattern of transportation service increases. In addition, the bidding price is likely to decrease when a number of competitors and a pre-empty backhaul to new lane distance ratio with number of competitors increase. Whereas, a pre-empty backhaul to new lane distance ratio raises, it does impact positively to the bid-to-cost ratio of carrier in transportation market.

To find the optimal bid-to-cost ratio for bidder in the incomplete information game, we then introduce the solution algorithm in which employs the stochastic optimization model, and we use Monte Carlo method to generate the bidding behavior of competitor. The result acquired by solution algorithm could find the optimal bid-to-cost ratio for bidder to obtain the maximum expected profit and probability of winning. Moreover, the outcomes of simulations with incomplete information game show that the optimal solution of bidder regarding solution algorithm can enhance the expected profit over cost compared with average bid-to-cost of carrier in the transportation market substantially. In addition, in turn the results present that shipper also gains the benefit from the optimal solution in combinatorial transportation auction by which shipper could lower cost of transportation service procurement considerably.

While we focus on the competition between bidder and competitor with the incomplete information game in this paper, the study on combinatorial transportation auction with known information among players is another interesting theme that researcher should be considered in the future research. This is to find the optimal bid price in this circumstance and also discover the relationship between benefits and level of known information among players in the general.

6. ACKNOWLEDGEMENTS

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Indian Banking Industry: Challenges And Opportunities

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Abstract

The banking industry in India has a huge canvas of history, which covers the traditional banking practices from the time of Britishers to the reforms period, nationalization to privatization of banks and now increasing numbers of foreign banks in India. Therefore, Banking in India has been through a long journey. Banking industry in India has also achieved a new height with the changing times. The use of technology has brought a revolution in the working style of the banks. Nevertheless, the fundamental aspects of banking i.e. trust and the confidence of the people on the institution remain the same. The majority of the banks are still successful in keeping with the confidence of the shareholders as well as other stakeholders. However, with the changing dynamics of banking business brings new kind of risk exposure.

In this paper an attempt has been made to identify the general sentiments, challenges and opportunities for the Indian Banking Industry. This article is divided in three parts. First part includes the introduction and general scenario of Indian banking industry. The second part discusses the various challenges and opportunities faced by Indian banking industry. Third part concludes that urgent emphasis is required on the Indian banking product and marketing strategies in order to get sustainable competitive edge over the intense competition from national and global banks.

This article is a small seed to existing branch of knowledge in banking industry and is useful for bankers, strategist, policy makers and researchers.

Key words: Rural Market, Risk Management, Global Banking, Employee and Customer Retention.

1. INTRODUCTION

In recent time, we have witnessed that the World Economy is passing through some intricate circumstances as bankruptcy of banking & financial institutions, debt crisis in major economies of the world and euro zone crisis. The scenario has become very uncertain causing recession in major economies like US and Europe. This poses some serious questions about the survival, growth and maintaining the sustainable development.

However, amidst all this turmoil India's Banking Industry has been amongst the few to maintain resilience. The tempo of development for the Indian banking industry has been remarkable over the past decade. It is evident from the higher pace of credit expansion, expanding profitability and productivity similar to banks in developed markets, lower incidence of non-performing assets and focus on financial inclusion have contributed to making Indian banking vibrant and strong. Indian banks have begun to revise their growth approach and re-evaluate the prospects on hand to keep the economy rolling.

In this paper an attempt has been made to review various challenges which are likely to be faced by Indian banking industry.

2. HISTORICAL BACKGROUND

Bank of Hindustan was set up in 1870; it was the earliest Indian Bank. Later, three presidency banks under Presidency Bank's act 1876 i.e. Bank of Calcutta, Bank of Bombay and Bank of Madras were set up, which laid foundation for modern banking in India. In 1921, all presidency banks were amalgamated to form the Imperial Bank of India. Imperial bank carried out limited number of central banking functions prior to establishment of RBI. It engaged in all types of commercial banking business except dealing in foreign exchange.

Reserve Bank of India Act was passed in 1934 & Reserve Bank of India (RBI) was constituted as an apex body without major government ownership. Banking Regulations Act was passed in 1949. This regulation brought RBI under government control. Under the act, RBI got wide ranging powers for supervision & control of banks. The Act also vested licensing powers & the authority to conduct inspections in RBI.

In 1955, RBI acquired control of the Imperial Bank of India, which was renamed as State Bank of India. In 1959, SBI took over control of eight private banks floated in the erstwhile princely states, making them as its 100% subsidiaries.

It was 1960, when RBI was empowered to force compulsory merger of weak banks with the strong ones. It significantly reduced the total number of banks from 566 in 1951 to 85 in 1969. In July 1969, government nationalised 14 banks having deposits of Rs. 50 crores & above. In 1980, government acquired 6 more banks with deposits of more than Rs.200 crores. Nationalisation of banks was to make them play the role of catalytic agents for economic growth. The Narasimha Committee report suggested wide ranging reforms for the banking sector in 1992 to introduce internationally accepted banking practices. The amendment of Banking Regulation Act in 1993 saw the entry of new private sector banks.

Banking industry is the back bone for growth of any economy. The journey of Indian Banking Industry has faced many waves of economic crisis. Recently, we have seen the economic crisis of US in 2008-09 and now the European crisis. The general scenario of the world economy is very critical.

It is the banking rules and regulation framework of India which has prevented it from the world economic crisis. In order to understand the challenges and opportunities of Indian Banking Industry, first of all, we need to understand the general scenario and structure of Indian Banking Industry.

3. GENERAL BANKING SCENARIO IN INDIA

The general banking scenario in India has become very dynamic now-a-days. Before pre-liberalization era, the picture of Indian Banking was completely different as the Government of India initiated measures to play an active role in the economic life of the nation, and the Industrial Policy Resolution adopted by the government in 1948 envisaged a mixed economy. This resulted into greater involvement of the state in different segments of the economy including banking and finance.

The Reserve Bank of India was nationalized on January 1, 1949 under the terms of the Reserve Bank of India (Transfer to Public Ownership) Act, 1948. In 1949, the Banking Regulation Act was enacted which empowered the Reserve Bank of India (RBI) "to regulate, control, and inspect the banks in India." The Banking Regulation Act also provided that no new bank or branch of an existing bank could be opened without a license from the RBI, and no two banks could have common directors.

By the 1960s, the Indian banking industry had become an important tool to facilitate the speed of development of the Indian economy. The Government of India issued an ordinance and nationalised the 14 largest commercial banks with effect from the midnight of July 19, 1969. A second dose of nationalization of 6 more commercial banks followed in 1980. The stated reason for the nationalization was to give the government more control of credit delivery. With the second dose of nationalization, the Government of India controlled around 91% of the banking business of India. Later on, in the year 1993, the government merged New Bank of India with Punjab National Bank. It was the only merger between nationalized banks and resulted in the reduction of the number of nationalised banks from 20 to 19. After this, until the 1990s, the nationalised banks grew at a pace of around 4%, closer to the average growth rate of the Indian economy.

In the early 1990s, the then Narasimha Rao government embarked on a policy of liberalization, licensing a small number of private banks.

The next stage for the Indian banking has been set up with the proposed relaxation in the norms for Foreign Direct Investment, where all Foreign Investors in banks may be given voting rights which could exceed the present cap of 10%, at present it has gone up to 74% with some restrictions.

The new policy shook the Banking sector in India completely. Bankers, till this time, were used to the 4-6-4 method (Borrow at 4%; Lend at 6%; Go home at 4) of functioning. The new wave ushered in a modern outlook and tech-savvy methods of working for traditional banks. All this led to the retail boom in India. People not just demanded more from their banks but also received more.

4. STRUCTURE OF INDIAN BANKING INDUSTRY

Banking Industry in India functions under the sunshade of Reserve Bank of India - the regulatory, central bank. Banking Industry mainly consists of:

- Commercial Banks
- Co-operative Banks

The commercial banking structure in India consists of: Scheduled Commercial Banks
Unscheduled Bank. Scheduled commercial Banks constitute those banks which have been included in the Second Schedule of Reserve Bank of India (RBI) Act, 1934.

RBI in turn includes only those banks in this schedule which satisfy the criteria laid down vide section 42 (60) of the Act. Some co-operative banks are scheduled commercial banks although not all co-operative banks are. Being a part of the second schedule confers some benefits to the bank in terms of access to accommodation by RBI during the times of liquidity constraints. At the same time, however, this status also subjects the bank certain conditions and obligation towards the reserve regulations of RBI.

For the purpose of assessment of performance of banks, the Reserve Bank of India categorise them as public sector banks, old private sector banks, new private sector banks and foreign banks.

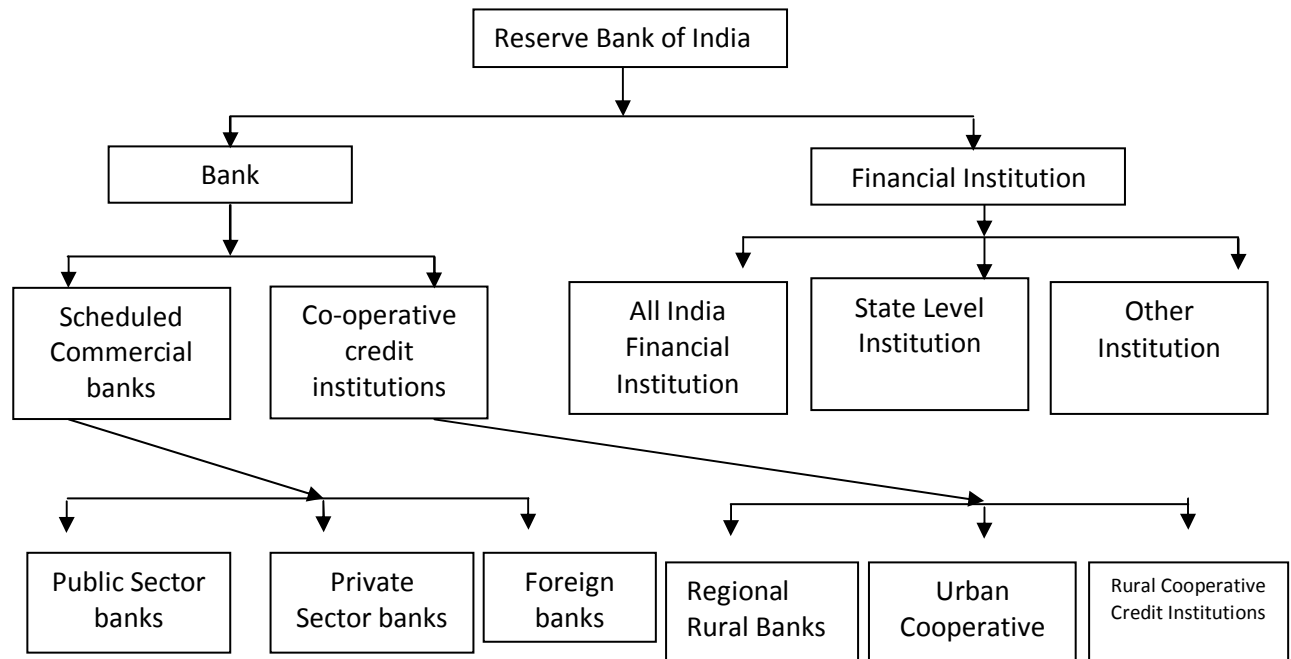


FIGURE 1: The commercial banking structure in India

S.No.	Nationalized Banks	Old Private Sector Banks	New Private Sector Banks	Foreign Banks
1	Allahabad Bank Ltd.	Catholic Syrian Bank Ltd.	Axis Bank Ltd.	Abu Dhabi Commercial Bank
2	Andhra Bank Ltd.	City Union Bank Ltd.	Development Credit Bank Ltd.	American Express Bank
3	Bank of Baroda Ltd.	Dhanalakshmi Bank Ltd.	HDFC Bank Ltd.	Bank Internasional Indonesia
4	Bank of India Ltd.	Federal Bank Ltd.	ICICI Bank Ltd.	Bank of America NA
5	Bank of Maharashtra Ltd.	ING Vysya Bank Ltd.	IndusInd Bank Ltd.	Bank of Ceylon
6	Canara Bank Ltd.	Jammu and Kashmir Bank Ltd.	Kotak Mahindra Bank Ltd.	Bank of Nova Scotia (Scotia Bank)
7	Central Bank of India Ltd.	Karnataka Bank Ltd.	Yes Bank Ltd.	Bank of Tokyo Mitsubishi UFJ
8	Corporation Bank Ltd.	Karur Vysya Bank Ltd.		Barclays Bank PLC
9	Dena Bank Ltd.	Lakshmi Vilas Bank Ltd.		BNP Paribas
10	IDBI Bank Ltd.	Nainital Bank Ltd.		Calyon Bank
11	Indian Bank Ltd.	Ratnakar Bank Ltd.		Chinatrust Commercial Bank
12	Indian Overseas Bank Ltd.	SBI Commercial and International Bank Ltd.		Citibank N.A.
13	Oriental Bank of Commerce Ltd.	South Indian Bank Ltd.		DBS Bank
14	Punjab and Sind Bank Ltd.	Tamilnad Mercantile Bank Ltd.		Deutsche Bank AG
15	Punjab National Bank Ltd.			HSBC

16	Syndicate Bank Ltd.			JPMorgan Chase Bank
17	UCO Bank Ltd.			Krung Thai Bank
18	Union Bank of India Ltd.			Mashreq Bank psc
19	United Bank of India Ltd.			Mizuho Corporate Bank
20	Vijaya Bank Ltd.			Royal Bank of Scotland
21	State Bank of Bikaner and Jaipur Ltd.			Shinhan Bank
22	State Bank of Hyderabad Ltd.			Société Générale
23	State Bank of India Ltd.			Sonali Bank
24	State Bank of Mysore Ltd.			Standard Chartered Bank
25	State Bank of Patiyala Ltd.			State Bank of Mauritius
26	State Bank of Travankore			UBS
27				VTB

Source: http://finance.indiamart.com/investment_in_india/scheduled_commercial_banks.html

TABLE 1: Scheduled Commercial Banks Operating In India

5. CHALLENGES FACED BY INDIAN BANKING INDUSTRY

Developing countries like India, still has a huge number of people who do not have access to banking services due to scattered and fragmented locations. But if we talk about those people who are availing banking services, their expectations are raising as the level of services are increasing due to the emergence of Information Technology and competition. Since, foreign banks are playing in Indian market, the number of services offered has increased and banks have laid emphasis on meeting the customer expectations.

Now, the existing situation has created various challenges and opportunity for Indian Commercial Banks. In order to encounter the general scenario of banking industry we need to understand the challenges and opportunities lying with banking industry of India.

5.1 Rural Market

Banking in India is generally fairly mature in terms of supply, product range and reach, even though reach in rural India still remains a challenge for the private sector and foreign banks. In terms of quality of assets and capital adequacy, Indian banks are considered to have clean, strong and transparent balance sheets relative to other banks in comparable economies in its region.

Consequently, we have seen some examples of inorganic growth strategy adopted by some nationalized and private sector banks to face upcoming challenges in banking industry of India. For example recently, ICICI Bank Ltd. merged the Bank of Rajasthan Ltd. in order to increase its reach in rural market and market share significantly. State Bank of India (SBI), the largest public sector bank in India has also adopted the same strategy to retain its position. It is in the process of acquiring its associates. Recently, SBI has merged State Bank of Indore in 2010.

5.1 Management of Risks

The growing competition increases the competitiveness among banks. But, existing global banking scenario is seriously posing threats for Indian banking industry. We have already witnessed the bankruptcy of some foreign banks.

According to Shrieves (1992), there is a positive association between changes in risk and capital. Research studied the large sample of banks and results reveal that regulation was partially effective during the period covered. Moreover, it was concluded that changes in bank capital over the period studied was risk-based [1].

Wolgast, (2001) studied the Merger and acquisition activity among financial firms. The author focused bank supervisors in context with success of mergers, risk management, financial system stability and market liquidity. The study concluded that large institutions are able to maintain a superior level of risk management [2].

Al-Tamimi and Al-Mazrooei (2007) examined the risk management practices and techniques in dealing with different types of risk. Moreover, they compared risk management practices between the two sets of banks. The study found the three most important types of risk i.e. commercial banks foreign exchange risk, followed by credit risk, and operating risk [3].

Sensarma and Jayadev (2009) used selected accounting ratios as risk management variables and attempted to gauge the overall risk management capability of banks. They used multivariate statistical techniques to summarize these accounting ratios. Moreover, the paper also analyzed the impact of these risk management scores on stock returns through regression analysis. Researchers found that Indian banks' risk management capabilities have been improving over time. Returns on the banks' stocks appeared to be sensitive to risk management capability of banks. The study suggest that banks want to enhance shareholder wealth will have to focus on successfully managing various risks [4].

5.3 Growth of Banking

Zhao, Casu and Ferrari (2008) used a balanced panel data set covering the period of 1992-2004 and employing a Data Envelopment Analysis (DEA)-based Malmquist Total Factor Productivity (TFP) index. The empirical study indicated that, after an initial adjustment phase, the Indian banking industry experienced sustained productivity growth, which was driven mainly by technological progress. Banks' ownership structure does not seem to matter as much as increased competition in TFP growth. Foreign banks appear to have acted as technological innovators when competition increased, which added to the competitive pressure in the banking market. Finally, our results also indicate an increase in risk-taking behaviour, along with the whole deregulation process [5].

It was found in the study of Goyal and Joshi (2011a) that small and local banks face difficulty in bearing the impact of global economy therefore, they need support and it is one of the reasons for merger. Some private banks used mergers as a strategic tool for expanding their horizons. There is huge potential in rural markets of India, which is not yet explored by the major banks. Therefore ICICI Bank Ltd. has used mergers as their expansion strategy in rural market. They are successful in making their presence in rural India. It strengthens their network across geographical boundary, improves customer base and market share [6].

5.4 Market Discipline and Transparency

According to Fernando (2011) transparency and disclosure norms as part of internationally accepted corporate governance practices are assuming greater importance in the emerging environment. Banks are expected to be more responsive and accountable to the investors. Banks have to disclose in their balance sheets a plethora of information on the maturity profiles of assets and liabilities, lending to sensitive sectors, movements in NPAs, capital, provisions, shareholdings of the government, value of investment in India and abroad, operating and profitability indicators,

the total investments made in the equity share, units of mutual funds, bonds, debentures, aggregate advances against shares and so on [7].

5.5 Human Resource Management

Gelade and Ivery (2003) examined relationships between human resource management (HRM), work climate, and organizational performance in the branch network of a retail bank. Significant correlations were found between work climate, human resource practices, and business performance. The results showed that the correlations between climate and performance cannot be explained by their common dependence on HRM factors, and that the data are consistent with a mediation model in which the effects of HRM practices on business performance are partially mediated by work climate [8].

Bartel (2004) studied the relationship between human resource management and establishment performance of employees on the manufacturing sector. Using a unique longitudinal dataset collected through site visits to branch operations of a large bank, the author extends his research to the service sector. Because branch managers had considerable discretion in managing their operations and employees, the HRM environment could vary across branches. Site visits provided specific examples of managerial practices that affected branch performance. An analysis of responses to the bank's employee attitude survey that controls for unobserved branch and manager characteristics shows a positive relationship between branch performance and employees' satisfaction with the quality of performance evaluation, feedback, and recognition at the branch—the "incentives" dimension of a high-performance work system. In some fixed effects specifications, satisfaction with the quality of communications at the branch was also important [9].

5.6 Global Banking

It is practically and fundamentally impossible for any nation to exclude itself from world economy. Therefore, for sustainable development, one has to adopt integration process in the form of liberalization and globalization as India spread the red carpet for foreign firms in 1991. The impact of globalization becomes challenges for the domestic enterprises as they are bound to compete with global players.

If we look at the Indian Banking Industry, then we find that there are 36 foreign banks operating in India, which becomes a major challenge for Nationalized and private sector banks. These foreign banks are large in size, technically advanced and having presence in global market, which gives more and better options and services to Indian traders.

5.7 Financial Inclusion

Financial inclusion has become a necessity in today's business environment. Whatever is produced by business houses, that has to be under the check from various perspectives like environmental concerns, corporate governance, social and ethical issues. Apart from it to bridge the gap between rich and poor, the poor people of the country should be given proper attention to improve their economic condition.

Dev (2006) stated that financial inclusion is significant from the point of view of living conditions of poor people, farmers, rural non-farm enterprises and other vulnerable groups. Financial inclusion, in terms of access to credit from formal institutions to various social groups. Apart from formal banking institutions, which should look at inclusion both as a business opportunity and social responsibility, the author conclude that role of the self-help group movement and microfinance institutions is important to improve financial inclusion. The study suggested that this requires new regulatory procedures and de-politicisation of the financial system [10].

5.8 Employees' Retention

The banking industry has transformed rapidly in the last ten years, shifting from transactional and customer service-oriented to an increasingly aggressive environment, where competition for revenue is on top priority. Long-time banking employees are becoming disenchanted with the

industry and are often resistant to perform up to new expectations. The diminishing employee morale results in decreased revenue. Due to the intrinsically close ties between staff and clients, losing those employees completely can mean the loss of valuable customer relationships. The retail banking industry is concerned about employee retention from all levels: from tellers to executives to customer service representatives because competition is always moving in to hire them away.

The competition to retain key employees is intense. Top-level executives and HR departments spend large amounts of time, effort, and money trying to figure out how to keep their people from leaving.

Sekaran, U. (1989) studied a sample of 267 bank employees, this study traced the paths to the job satisfaction of employees at the workplace through the quality of life factors of job involvement and sense of competence. Results indicated that personal, job, and organizational climate factors influenced the ego investment or job involvement of people in their jobs, which in turn influenced the intra-psychic reward of sense of competence that they experienced, which then directly influenced employees' job satisfaction [11].

Mitchell, Holtom, Lee and Graske (2001) asserted in their study that people often leave for reasons unrelated to their jobs. In many cases, unexpected events or shocks are the cause. Employees also often stay because of attachments and their sense of fit, both on the job and in their community [12].

Saxena and Monika (2010) studied a case of 5 companies out of 1000 organizations and 8752 respondents surveyed across 800 cities in India by Business Today. The survey was on nine basic parameters like career and personal growth, company prestige, training, financial compensation and benefits and merit based performance evaluation. It was concluded that the biggest challenge for organizations is that when new employees appointed, it is difficult to merge them in organizational culture. Each organization has its own unique culture and most often, when brought together, these cultures clash. When there is no retention, employees point to issues such as identity, communication problems, human resources problems, ego clashes, and intergroup conflicts, which all fall under the category of "cultural differences" [13].

5.9 Customer Retention

Levesque and McDougall (1996) investigated the major determinants of customer satisfaction and future intentions in the retail bank sector. They identified the determinants which include service quality dimensions (e.g. getting it right the first time), service features (e.g. competitive interest rates), service problems, service recovery and products used. It was found, in particular, that service problems and the bank's service recovery ability have a major impact on customer satisfaction and intentions to switch [14].

Clark (1997) studied the impact of customer-employee relationships on customer retention rates in a major UK retail bank. He revealed that employee and customer perceptions of service quality are related to customer retention rates and that employee and customer perceptions of service quality are related to each other [15].

Clark (2002) examined the relationship between employees' perceptions of organizational climate and customer retention in a specific service setting, viz. a major UK retail bank. Employees' perceptions of the practices and procedures in relation to customer care at their branch were investigated using a case study approach. The findings revealed that there is a relationship between employees' perceptions of organizational climate and customer retention at a micro-organizational level. He suggested that organizational climate can be subdivided into five climate themes and that, within each climate theme, there are several dimensions that are critical to customer retention [16].

Hansemark and Albinsson (2004) explored how the employees of a company experience the concepts of customer satisfaction and retention. They used phenomenological method, allowing the informants' own interpretations to be discovered. Satisfaction was discussed from three perspectives: definition of the concept, how to recognise when a customer is satisfied, and how to enhance satisfaction. The informants' experience pertaining to these three categories varied, and a total of seven ways to define, recognise or enhance satisfaction were discovered. These were: service, feeling, chemistry, relationship and confidence, dialogue, complaints and retention. All except the first two of these categories of experience were found to enhance retention, implying that the informants have found that strategies for enhancing both satisfaction and retention are similar [17]. The strongest connection between retention and satisfaction strategies turned out to be in terms of relationship and confidence.

5.10 Environmental Concerns

It is quite clear from the recently formed Copenhagen Climate Council (CCC) that there is a severe need for environmental awareness among all the countries of the world. CCC published Thought Leadership Series on Climate Change which is a collection of inspirational, concise and clearly argued pieces from some of the world's most renowned thinkers and business leaders on climate change. The objective of the pieces is to assist in enhancing the public and political awareness of the actions that could have a significant impact on global emissions growth and to disseminate the message that it is time to act. The Thought Leadership Series was aimed at explaining and spreading awareness of the key elements in the business and policy response to the climate problem. The rationale for the Thought Leadership Series was to change the focus of people.

5.11 Social and Ethical Aspects

There are some banks, which proactively undertake the responsibility to bear the social and ethical aspects of banking. This is a challenge for commercial banks to consider these aspects in their working. Apart from profit maximization, commercial banks are supposed to support those organizations, which have some social concerns.

Benedikter (2011) defines Social Banks as "banks with a conscience". They focus on investing in community, providing opportunities to the disadvantaged, and supporting social, environmental, and ethical agendas. Social banks try to invest their money only in endeavours that promote the greater good of society, instead of those, which generate private profit just for a few. He has also explained the main difference between mainstream banks and social banks that mainstream banks are in most cases focused solely on the principle of profit maximization whereas, social banking implements the triple principle of profit-people-planet [18].

Goyal and Joshi (2011b) have concluded in their study on social and ethical aspects of Banking Industry that Banks can project themselves as a socially and ethically oriented organization by disbursement of loans merely to those organizations, which has social, ethical and environmental concerns [19].

6. CONCLUSION

Over the years, it has been observed that clouds of trepidation and drops of growth are two important phenomena of market, which frequently changes in different sets of conditions. The pre and post liberalization era has witnessed various environmental changes which directly affects the aforesaid phenomena. It is evident that post liberalization era has spread new colors of growth in India, but simultaneously it has also posed some challenges.

This article discusses the various challenges and opportunities like rural market, transparency, customer expectations, management of risks, growth in banking sector, human factor, global banking, environmental concern, social, ethical issues, employee and customer retentions. Banks are striving to combat the competition. The competition from global banks and technological innovation has compelled the banks to rethink their policies and strategies.

7. SUGGESTIONS

As per the above discussion, we can say that the biggest challenge for banking industry is to serve the mass market of India. Companies have shifted their focus from product to customer. The better we understand our customers, the more successful we will be in meeting their needs. In order to mitigate above mentioned challenges Indian banks must cut their cost of their services. Another aspect to encounter the challenges is product differentiation. Apart from traditional banking services, Indian banks must adopt some product innovation so that they can compete in gamut of competition. Technology up gradation is an inevitable aspect to face challenges.

The level of consumer awareness is significantly higher as compared to previous years. Now-a-days they need internet banking, mobile banking and ATM services.

Expansion of branch size in order to increase market share is another tool to combat competitors. Therefore, Indian nationalized and private sector banks must spread their wings towards global markets as some of them have already done it. Indian banks are trustworthy brands in Indian market; therefore, these banks must utilize their brand equity as it is an valuable asset for them.

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Defining Business Network

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Abstract

The purpose of the present scientific contribution is to investigate from the business economics standpoint the emerging phenomenon of company networks. In particular, through the analysis of the theory of networks will be proposed the principal categories of business networks, and even before this the concept of the network will be defined. The proposed research, qualitatively, represents the point of departure for the study of the network phenomenon in light of the current economic phase termed "economy of knowledge". Moreover, the research questions are the following: From where does the theory of networks arise? Do company networks consider themselves equal to knowledge networks?

Keywords : Network, Business Network, Knowledge.

1. INTRODUCTION

With the birth of reticular capitalism (Schiavone, 2008), the postford companies create collective value through the effect of group action and group interests of the productive multi-business system: the processes of creating value realized by single companies appear always more dependent on those of other companies.

In this sense, the concept of company networks has made progress: a group of companies with free access to cooperative relations modify, on the one hand, the mechanisms of administration of businesses and economic sectors; and on the other, the mechanisms of the functioning of the market.

Although the network derives from centralizing phenomena or of productive decentralization (Powell, 2001) there are no constraints in its formation in terms of size: company networks are formed both by small business realities, as well as by large companies (Grandori, 1999). From this point, the phenomenon of company networks represents an opportunity for encounter and growth.

In light of what has been laid out, the present article proposes to investigate the phenomenon of networks starting from the analysis of the scientific research that currently exists for interpreting the paradigm.

To continue on this theme, the definition of network, according to the literature, and the reconstruction of the historic evolution of the theory of networks, appear to be indicated in order to identify reticular typologies. Furthermore, the research question is the following: In what areas does the theory of networks originate? What is a company network? What are the network typologies? From the economic-business point of view do company networks consider themselves the equal of networks of knowledge?

2. THE THEORY OF NETWORKS

Among the first contributions useful in explaining the phenomenon of company networks is the theory of graphs (Barabasi, 2002): it investigates the structure of networks, on the one hand, identifying the laws governing the expansion of networks, and on the other, recognizing

certain physical, mathematical and innovative theories; in this regard the use of *social network analysis* has assumed particular importance (Wasserman, 1994) as a set of instruments and techniques for investigating social relationships.

The theory of graphs originated in 1736 with the mathematical demonstration of Eulero. He introduced the geometric solution to the problem of the position of the seven Bridges of Königsberg in Prussia, built on the Pregel river: find a way to cross each bridge only once in order to visit the entire city.

Eulero substituted the land areas of the city, divided by the bridges, with annular junctions and every bridge with a *link* or connection. In this way the first graph with four junctions and seven *links* originated. The solution to the problem is shown by the non-existence of a path that crosses all the sides of the city only once: networks are distinguished by many properties which can limit or favour solutions to problems. This means that small structural changes can provide new opportunities for *problem solving*.

The theory of graphs has undergone changes introduced by Cauchy, Hamilton, Cayley, Kirchhoff e Polya. Only recently, around the 1950's, have academics concentrated on the how and why of the origin of graphs and, therefore, networks: such questions were the theme of the research of two Hungarian scholars, Paul Erdős e Alfréd Rény, who layed the foundation for the theory of networks or random graphs.

The main difference between the theory of graphs and the theory of random graphs lie in the fact that the first analyzes the regular graphs: the junctions of the networks have all the same number of connections. The second theory holds, instead that if the links are randomly located in the network, every single junction can have the same probability of acquiring the connections. Moreover, the random network, even if there is a fixed number of junctions, is marked by the presence of equivalent junctions, connected among themselves among themselves.

The theory of graphs or of random networks is similar to social relationships which it discusses as the concept of social capital: it represents the set of relational resources which a group can use, together with other relational resources to achieve its goals. Currently, the economic *performance* generated by company networks seems to be influenced by the social context in which it operates.

The changes undergone by the theory of random networks have also affected the distance between junctions.

On this subject, the principal analysis has been carried out by Milgram (1967), who tried to understand the distance between tow cities in the United States through the sending of letters of specific towns. From this perspective the networks comprise a small world (Buchanan, 2002). Only a few connections are need to reach people, companies and the web.

Only at the end of the 1960's are interpersonal networks begun to be spoken of according to the sociologist Granovetter (1973): his studies attempt to analyse relationships integrated in social networks in terms of intensity.

In this regard, the investigation of the strength of bonds, whether weak, or strong, confirms the influence of social networks in the search for work. He demonstrates that weak bonds, consisting of mild friendships, have greater chances of obtaining access to work information compared to those who depend on family ties or intimate friendships.

Granovetter diverges from the idea of Erdős and Rény: he thinks of a company as if it were a *cluster* of friends in which everyone knows everyone else; weak bonds are few and represent a link to the outside world even in terms of information. The measure of a *cluster*, inside social networks, was introduced by Watts and Strogatz to determine the strength of the circle of friends.

The authors maintain that such a phenomenon applies both to social networks and all other types of networks. *Clustering* can be created in any area (Johnson, 2009).

Assuming the analysis of a circular network in which every junction is connected to the next, it becomes a small world adding only internally a few networks at random. With the connections discover the shortcuts between the more distant junctions, effectively bringing them closer together.

If it is assumed that a company, represented by a circular form, identifies a big world, not a small one; few *links* are needed to reduce the average separation between the junctions of the network.

Moreover, the *test* of the degree of sociability of the junctions, used by Gladwell in "The tipping point" (2000), has demonstrated how each person or junction possess the extraordinary ability to make friends and, furthermore, have a higher number of connections. Connectors recognizable as hubs dominate the reticular structure of which they form a part.

They reduce the distance between the junctions creating a small world within the company. From this point forward, the existence of the connectors guarantees the missing fragmentation of the network.

The networks of the real world, from which originate the invariability of scale, are regulated by the laws of power. In virtue of this, the degree of distribution of a random network follows a bell curve and the junctions have the same number of *links*; in networks of invariable scale, instead, almost all the junctions have a few connections managed by presence of some *hubs* connecting them.

Understanding this shows the limits of the theories of both Erdős e Rény, and Watts and Strogatz: These ignored the existence of reticular connections.

Only with the introduction of networks of invariable scale, of the real world, has the function of connectors in terms of invariability of scale, dynamism, durability, and resistance to damage from the network itself, come to be understood.

The networks of the real world are based on growth, which justifies the presence of the *hubs*, and on the preferential connection to more junctions more popular because of their attractiveness.

The changes in the theory of invariability of scale permits world networks to be defined as follows;

- they are formed by junctions and arches: social units (individuals, groups, companies) and relationships;
- new network junctions emerge spontaneously, depending on the real world network typology considered;
- the networks, the junctions and their connections can disappear depending on events affecting the network, such as attacks targeting the network, or viruses, which make the reticular system vulnerable;
- the network junctions can be rewired and so replaced with other preferred junctions.
- the network junctions age and, furthermore, lose their ability to create new connections.

3. WHAT IS A COMPANY NETWORK

The company network is a free business association, able to create structures and processes capable of joint decision making and of integrating the efforts of members to design and produce goods and services, to develop new processes, to reduce times needed for innovation or for entry into the market, to exchange information and other resources.

There are multiple opportunities available to businesses in the network: relationship investment encourages interdependence between different systems and reinforces their complementarity; every cooperative process affects every company of the network.

The most common graphic representation of a network contains a certain number of junctions (people, groups of companies) and arches, which indicate the relationships between various network individuals.

Depending on how they are defined, connections or *links* are expressions of the inter-business communication process.

The transfer of knowledge in the field of networks must take into account the analysis of certain elements which distinguish the relationship:

- the context. The relationship begins when certain events take place: the parties involved are subjected to informational asymmetry;
- reciprocity. The bond between the involved parties is characterized by bi-directionality and, furthermore, by a certain level of correspondence between the junctions;
- interpretation. This comes from the suggested meaning associated with the symbols expressed in the relationship;
- the content. This comes from the meaning denoted by the symbols expressed in the course of an interaction;
- the strength of the connection. The frequency or the strength of the bonds are often determined by their duration.
- the susceptibility of a junction to a virus. This factor represents the possibility of contagion of the reticular nodes with respect to the acquisition of new information and ideas.

The combination of such elements determines the analytical power and the depth of the analysis of the network. The study of the intensity of the connections, according to Granovetter, shows that the more useful information, in the area of work, come from individuals who belong to extensive, and not restricted networks: acquaintances or friends of friends. The strong bonds within a group allow network junctions to share the same information. In this light, information coming from outside offers unique perspectives and

strategic advantages to those who obtain it. It should not be forgotten, however that weak connections supply a fundamental informational support system, overcoming the limits of the strong connections: on the one hand, it is possible to form relationships to discuss matters that one does not want closer collaborators to become aware of; on the other they promote social interaction and a sense of community.

4. TYPOLOGIES OF COMPANY NETWORKS

According to economic theory both a macro and a micro perspective exist which summarizes the concept under examination: the macro perspective compares the network to an instrument which coordinates companies; according to the micro perspective the network is investigated in terms of strategy and operations as a function of the changing dynamic of the company.

In the first case, the network, as an instrument of coordination represents a hybrid form of the market and hierarchy (Williamson, 1991), an alternative form of market and hierarchy (Powell, 1990), coordination which uses mechanisms of *governance* that go beyond the market and the hierarchy (Grandori, 1999).

The predominant theory identifies an intermediate organizational model between the market and the hierarchy since it is based on cooperation between companies and on procedures of interaction specific to the *partners*.

In order to explain the procedures which regulate relationships between economic agents, according to transactional cost theory, a set of management mechanisms are identified in the market based on the meeting of supply and demand; while in the hierarchy a set of mechanisms based on the hierarchical authority of *management*.

According to Williamson the transaction cost represents the instrument useful for deciding whether to carry out a production activity internally or to delegate its production to the market. At this point, *management* chooses one of the two procedures as a function of transaction variables: uncertainty, time frequency and the specificity of available resources for exchange: the aforementioned theory identifies the basis for economic exchange in the transaction: "*The transfer of a good or service through a technologically separable interface.*" (Williamson, 1985).

At this point, the market and the hierarchy are not the sole, unique options available to the company to conduct its business. Since the competitive business context is characterized by uncertainty, transactions have to be controlled by suitable instruments: contracts are replaced by hybrid *governance* agreements between the market and the hierarchy to combat environmental change. In other words, they look to the network.

In the second approach, the micro type, the network takes on the following characteristics:

- the external network unit identifies a set of organizationally distinct companies, but united from a strategic point of view in order to reach objective;
- the internal network unit identifies a large company with a central *core* and possessing more strategic business units or fewer individual objectives;
- at the interpersonal level the network is seen in relationships, even social ones, between diverse individuals within an organization.

Among these, the external network unit is the more researched model in business economics. In this regard, it is possible to distinguish different types of company of company networks.

The external company network sets up a further network which is viewed in business economics in terms of three reticular choices:

- the configuration of the company. Such a network is formed by a set of businesses guided by a company *leader*. The business systems are compatible thanks to the complementarity of knowledge in a position to develop synergistic relationships and determine common objectives.
- the *hollow corporation*: The company network *leader* initiates a policy of decentralization limiting itself to tasks of industrial organisation. The typical example is the fashion sector: the brand holding companies farm delegate manufacturing to outside firms, concentrating on the creation, design and commercialization of the product.
- the industrial zone: the postford network model represents "*a social territorial entity characterized by the active coexistence in a circumscribed area, naturalistically and historically determined, of a community of people of a population of industrial companies*" (Becattini, 1991). In other words, it represents an organization unique due to the presence of many companies with common structural characteristics.

An additional classification of external company networks is the following:

- the social network is made up of a group of companies which share values and linked informally;
- the bureaucratic network is comprised of a group of companies whose relations are regulated by formal institutional mechanisms such as, for example, *franchising* or supplier contracts, or authoritative power structures;
- the ownership network is made up of a group of companies which pool their resources, regulated by mechanisms based on property rights, in order to benefit from the advantages derived from activities carried out together. An example is the *joint venture*;

The network of companies is different from the company network: the latter is comprised of many companies which are legally autonomous, but joined in the productive process and by a vertical control hierarchy, especially during phases of a strategic character.

From the operational point of view, in the case of a network decentralization of production is initiated.

Moreover, depending on the distribution of power and the presence of central company, the company network can be (Lorenzoni, 1992):

- balanced. The balanced company network specifies a configuration of companies. There exists a group of companies coordinated by the leader company: the aim is the pursuit of a common goal;
- acentric. The acentric company network is formed by many companies that have the same power to determine the reticular dynamic evolution and that, also, pursue a common objective;
- governed. The governed company network is endowed with an operating system for determining strategy, both of the *mission* and of relationships;
- natural. The natural company network is distinguished by the lack of a legal *leader*, by a flexible structure, and by common strategy among the junctions of the network.

In the last analysis, if the investigative approach concentrates on the business system, the company network can be found in a single company which decentralizes its productive processes.

5. REFLECTIONS ON FUTURE RESEARCH

The phenomenon of company networks investigated in the present study represents the starting point for our further research. In particular, the avenues to be pursued concentrate on the analysis of innovative reticular models and on the study of networks of companies as networks of knowledge.

In the first hypothesis, the phenomenon is investigated in the existing literature on innovation: the network would appear functional in reaching a competitive advantage to the extent that a union of many companies promotes the development and improvement of innovations. From this point, the function of the network of companies as catalysts of business knowledge will be studied

Even if it is not possible to study in greater depth the theme of the current state of the economy of knowledge, we propose a first reflection on the concept of networks of knowledge. In fact a group of companies brings its own knowledge to the productive process or the supply of services; it integrates knowledge transforming it into new forms of knowledge. The creation of a team of companies promotes the forming of relationships based on trust, increases the possibility of innovating, and increases human capital. Such elements, synthesized through intangible business assets actually appear to be strategies for the creation of value over the long term.

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Creative Accounting and Managerial Decision on Selected Financial Institutions in Nigeria

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Abstract

The study was conducted to appraise the impact of creative accounting on management decisions of selected companies listed in the Nigerian Stock Exchange. With the background, the main objective of the study includes the examination of the extent to which macro-manipulation of financial statement affects management decisions; to examine the extent to which macro-manipulation of financial statement affects share price performance; and to determine the impact of misreported assets and liabilities as well as making recommendations to help remedy some of the problems.

The research method used was descriptive and the primary data collected were summarized and tabulated. These were picked in line with the hypotheses variables of the study so as to determine their validity. The model adopted for analysis of data was the multiple regression analysis. It was observed that the application of creativity in financial statement reporting significantly affects the decision of management to recapitalize the firm upward or dispose of it reserves. The study concluded that creative accounting through macro-manipulation of financial statements affects a firm's price and capital market performance. In view of the study, the researcher recommended that the application of creative accounting on management decision should be to avoid misreporting of assets and liabilities in their financial report, and that management decision towards creative accounting should be geared towards the relative advantage principle and good corporate governance which encourage challenges to current ways of thinking and not manipulating for self interest.

Key words: Creativity, Accounting, Management Decisions, Nigeria.

1. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

With an all- too-frequent occurrence, users of financial statements are shaken with disclosures by corporate management that certain "accounting irregularities" have been discovered and, as a result, current- and prior- year financial results require some kind of review (David (1993).

While the financial number game may have different labels, participation in it has a singular ultimate objective namely creating an altered impression of a firm's business performance. Niskanen & Kebharju (2000).

Thus, Mathew and Perera (1996) look at creative accounting in both positive and negative light. They opined that creative accounting have positive effect if it enhances the development of accounting practices and negative when it is meant to mislead and defraud investors, creditors, bankers and other users of financial statement.

Smith, (1992) book caused a stir in the United Kingdom (U.K) professional accounting circles. Titled accounting for Growth, with a sub-title stripping the Camouflage from Company

Accountants. Smith described the book in its cover as “The book they tried to ban”, but did not say who ‘tried to ban’ the book. He subsequently described the title of the book as “a deliberate pun” because, in his view, much of the apparent growth in company profits “in the 1980s was the result of the accounting slight of hand rather than genuine economic growth” (Smith, 1992). He gave an example of a private company, Brentford Nylon, which collapsed in 1976, shortly after reporting a profit of £ 130, 000 sterling, but was later taken over by another company, Lonrho. A more dramatic example was Polly Peck, a UK textile company. On 3 September 1990, the company had ‘announced record interim results for the six Months to 30 June 1990 and made enthusiastic comments on prospects for the year and beyond... Polly Peck was placed in administration on 25 October 1990” (Smith, 1992). These were a few of the several similar examples cited in the book. The above examples raised a fundamental question, How can a company that reports substantial profit during a particular period collapse shortly afterwards?” part of the possible answer to this question can be found in the first two words of the title of this paper, “Creative Accounting”, which this study examines with reference to firm quoted in Nigeria stock market as well as from global viewpoint.

1.2 STATEMENT OF PROBLEM

According to Wahlen (1999) financial statements provide information that is used by interested parties to assess the performance of managers and to make economic decisions. Users may assume that the financial information they receive is reliable and fit for its purpose.

Velayutham (2003) in his discussion on accounting regulation attempts to ensure that information is produced on a consistent basis in accordance with a set of rules that make it reliable for users. However, communications between entities and shareholders may be deliberately distorted by the activities of financial statement preparers who wish to alter the content of the message being transmitted. This type of distortion is often referred to as “creative accounting” or ‘earnings management’. While opinions on the acceptability of accounting manipulations vary, it is often perceived as reprehensible. The problems generated in the circumstance include:

- i. Macro-manipulation: When preparers become aware of a proposal to alter accounting regulation in a way that they feel will be advantageous to them, they may engage in lobbying to attempt to prevent the change. They attempt to bring about an alternative picture of economic reality which is more favorable to them. In this paper we identify this type of behaviour as macro –manipulation.
- ii. Micro-manipulation: In the perspective of individual or entity, this accounting approach involves preparers in attempting to violate accounting principles with a view to providing impression outside the accounting standard adopted generally accepted for the presentation of financial statement so as to create the view of reality that they wish to have communicated to users of the financial statements. This type of behavior is described in this paper as micro-manipulation.

In both cases, preparers are interested in creating the financial statements to suit their own purposes. Of course, they may genuinely feel that their view of economic reality is preferable from all points of view. However, it is also possible that they seek to distort the picture to meet their own needs.

Furthermore, preparers of financial statements expect to earn certain reward for their engagement in creative accounting. Some of desired rewards are an upward move in a firm’s share price, to improve debt ratings and reduced interest costs on borrowed slack and reduce restrictions from debt covenants. An interest in boosting a profit-based bonus may drive some. Finally, for high-profile firms, the motivation may be lower political costs, including avoiding more regulation or higher taxes.

1.3 OBJECTIVES OF THE STUDY

The broad objective of the study is to determine the impact of creative accounting on management decisions.

The main objectives of the study are as follows:

1. To examine the extent to which macro-manipulation of financial statement affects management decisions.
2. To examine the extent to which macro manipulation of financial statement affects share price performance.
3. To determine the impact of misreported assets and liabilities on assets acquisition decisions.
4. To evaluate how macro manipulation of financial statement affects capitalization decisions.
5. To determine the impact of macro manipulation of financial statement on debt rating decisions.

1.4 SCOPE OF THE STUDY

This study is not limited in case studies in question rather, it extends and covered every other company that has the duty of preparing and presenting financial statement to the various users for decision making. The selected firms only help to secure the research design which enables a valid and reliable conclusion of the study.

1.5 RESEARCH QUESTIONS

1. To what extent does macro manipulation of financial statement affect share price performance?
2. What is the effect of misreported assets and liabilities on assets acquisition decision?
3. To what extent does macro manipulation of financial statement affects capitalization decisions?
4. How has creative accounting negativity influenced the decision of potential investors and existing investors?
5. To what extent does macro manipulation of financial statement on debt rating?

1.6 RESEARCH HYPOTHESES

The formulated null research hypotheses for this study are as follows:

1. Ho: Macro manipulation of financial statement does not significantly affect share price performance
2. Ho: Misreported assets and liabilities do not significantly affect assets acquisition decisions.
3. Ho: Macro manipulation of financial statement does not significantly affect capitalization decisions.

1.7 SIGNIFICANCE OF THE STUDY

This study will have significant theoretical importance for academics, as it will contribute to the body of literature on creative accounting. The data generated and information gathered from the field survey and library research shall become secondary source of information and references for further studies.

2. THEORETICAL FRAMEWORK

Authors like Stolowy and Breton (2003) are among the few interested in the subject of creative accounting daring to suggest a theoretical framework for the understanding of the accounting manipulation practices.

2.1. RESOURCE DEPENDENCY THEORY

According to Pfeffer and Salancik's (1990) on the notion of independence, managers are quite dependent on shareholders because managerial compensation is frequently tied to stock price and investors have a great deal of discretion over where they invest their capital. If shareholders were concerned with whether managers had sufficient control over their firms, this might affect how managers account for firm performance? Although managers are limited by their dependencies, they can try to address the concern themselves by increasing their perceived amount of control (Pfeffer, 1981). Following Schlachter and Meindl's (1990) argument, managers can construct an illusion of control by not only taking credit for success but by accepting blame for negative outcomes. This not only address investors' worries that

managers lack control but also addresses the dependency the firm has on the shareholders by boosting their perceived power. To the extent that one would expect the Enron scandal to be on the minds of most top management teams, one might expect to find the effect regardless of firm characteristics.

2.2 AGENCY THEORY

Contrary to the resource dependency perspective, an agency theory perspective suggests that if owners are concerned that managers' interests are not in congruence with their own and that managers will act in ways that will prevent profit maximization and potentially threaten the company's existence, then owners must believe that such managers have a great deal of control over the firm. According to this point of view, the pattern of accepting blame found by Trueman and Titman (1988) and predicted to increase by resource dependence theory will not occur. In order to show the appropriateness of their conduct, managers will:

- a. Emphasize their role in positive outcomes, and
- b. Maximize their role in negative outcomes. To the extent that one would expect the Enron scandal to be on the minds of most top management teams. One might expect to find this effect regardless of firm characteristics.

2.3 INFORMATION THEORY

The information perspective or theory (Schipper, 1989) is a key element underpinning the study of the creative accounting phenomenon. A conflict is created by the information asymmetry that exists in corporate structures between a privileged management and a more remote body of stakeholders. Managers may choose to exploit their privileged position for private gains by managing financial reporting disclosure in their own favor. The information perspective assumes that accounting disclosures have information content that possesses value to stakeholders in providing useful signals. It may be difficult or impossible for individual stakeholders to discern the fact and the effect of accounting manipulation, because of an insufficient personal skill, indifference or an unwillingness to engage in detailed analysis (the mechanistic or naïve investor hypothesis, discussed by Breton and Taffler, 1995).

2.4 ETHICAL THEORY

Ruland (1984) opined that companies generally prefer to report a steady trend of growth in profit rather than to show volatile profits with a series of dramatic rises and falls. This is achieved by making unnecessary high provisions for liabilities and against assets values in good years so that these provisions can be reduced, thereby improving reported profits, in bad years. Advocates of this approach argue that it is a measure against the 'short-termism' of judging an investment on the basis of the yield achieved in the immediate following years. It also avoids raising expectations so high in good years that the company is unable to deliver what is required subsequently. Against this is argued that if the trading conditions of a business are in fact volatile then investors have a right to know this and that income smoothing may conceal long-term changes in the profit trend. Revins (1991) considers the problem in relation to both managers and shareholders and argues that each can draw benefits from 'loose' accounting standards that provide manager with latitude in timing the reporting of income. He thinks that the prime role of accounting is a mechanism for monitoring contracts between managers and other groups that provided finance also market mechanisms will operate efficiently, identifying the prospect of accounting manipulation and reflecting the appropriateness in pricing and contracting decisions.

3. RESEARCH DESIGN

The population of this study constitutes all the twenty-two (22) commercial banks trading on the floor of the Nigerian Stock Exchange (NSE).

According to Balsley and Clover (1988), it is common in research studies to use 10 percent sample size, because sample sizes of 10 percent of the universe have proved to be more than adequate in the past research projects. Ogolo (1996) corroborates this when he posits that, where a population is known, at least 10 percent of it constitutes a researchable sample. For this study, five commercial banks out of the twenty-two (22) commercial banks operating in Nigeria were selected for the purpose of the study. This translates to 22.73 percent of the

total banks in the country. To obtain the five (5) banks, the banks were arranged alphabetically, and the first out of every five was picked to form the sample for the study.

Sources of data: The data for this article were generated through primary source. It was difficult to get any data already used in this regard.

The method of collecting data was purely through the questionnaire. The questionnaires were directed to management staff at the tactical level. It is the completed forms returned from them. After the bio data section of the instrument, the other construction applied the Likert type scale to ease data generation.

a. MODEL SPECIFICATION

The model adopted for this study is the multiple regressions. This model becomes imperative against the background that the study sets to establish the relationship between creative accounting and management decisions in the selected firms in the study.

The equations stated under are meant to establish relationship among variables in the study:

$$Y = f(\text{SHPRIPERX1} + \text{ASSTACQDX2} + \text{CAPDECX3}) + \text{É} \dots \dots \dots 1$$

Where Y is effective management decisions

SHPRIPERF = shared price performance

ASSETACQD = Asset acquisition decisions

CAPDEC = Capitalization decisions

X₁, X₂, X₃ are the coefficients of the effect of macro-manipulation on each of the management decisions.

É is the allowance for standard error.

b. ESTIMATION AND VALIDATION

The instruments used for data collection were presented to expert in quantitative analysis to ascertain that the items in the instruments were related to the hypotheses required for the study. Again, there was a test – retests of the instrument to provide the assurance of reliability. Also, the results of the analysis provided a confirmative prove that the five banks under study were indicted for various offences including financial statements manipulation. That was a test of validity.

4 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 DATA PRESENTATION

TABLE 4.1

ADMINISTRATION OF QUESTIONNAIRES

Commercial Banks	Number distributed	Number returned	Percentage returned (%)	Percentage not returned (%)
Fin Bank	200	150	75%	25%
Oceanic Bank	200	140	70%	30%
Intercontinental Bank	200	180	90%	10%
Afri-Bank	200	160	80%	20%
Union Bank	200	170	85%	25%
Total	1000	800	80%	20%

Source: Field Survey 2010.

TABLE 4.2

LEAST SQUARE REGRESSION RESULT – MACRO-MANIPULATION AND SHARE PRICE PERFORMANCE AS MANAGEMENT DECISION PROXY

Variables	Estimated Coefficient	Standard error	t-value	Significance
Constant Term	5.013	.358	14.016	.000
MACROMAN	1.617	.062	1.000	.319
R	.870			
R ²	.759			
Adjusted r ²	.742			
F-Statistic	24.000			

Source: SPSS RESULTS.

TABLE 4.2.1

BENCHMARK (TABULATED VALUES) USING TWO TAIL TEST

Table F- Statistic F 0.05 (1, 200)	3.84
Table F- Statistic F 0.01 (1, 200)	6.63
Table Value t-value t 0.05 (a, b-1)	1.960
Table Value t- value t 0.01 (a, b-1)	2.576

Source: Gujarati, (2005). Essentials of Econometrics, Boston: McGraw Hill.

- a. Predictors: (Constant), MACROMAN
- b. Dependent Variable: SHPRIPERF

TABLE 4.3

LEAST SQUARE REGRESSION RESULTS – MACRO-MANIPULATION AND ASSET ACQUISITION AS MANAGEMENT DECISION PROXY

Variables	Estimated Coefficient	Standard error	t-value	Significance
Constant Term	4.249	.463	9.183	.000
MACROMAN	.103	.080	1.296	.197
R	.917			
R ²	.841			
Adjusted r ²	.813			
F-Statistic	21.679			

Source: SPSS RESULTS

TABLE 4.3.1

BENCHMARK (TABULATED VALUES) USING TWO- TAIL TEST

Table F- Statistic F 0.05 (1, 200)	3.84
Table F- Statistic F 0.01 (1, 200)	6.63
Table Value t-value t 0.05 (a, b-1)	1.960
Table Value t- value t 0.01 (a, b-1)	2.576

Source: Gujarati, (2005). Essentials of Econometrics, Boston: McGraw Hill.

- a. Predictors: (Constant), MACROMAN
- b. Dependent Variable: ASSTACQD

TABLE 4.4

LEAST SQUARE REGRESSION RESULTS – MACRO-MANIPULATION AND CAPITALIZATION DECISION AS MANAGEMENT DECISION PROXY

Variables	Estimated Coefficient	Standard error	t-value	Significance
Constant Term	5.255	.416	12.644	.000
MACROMAN	.051	.072	.707	.480
R	.850			
R ²	.723			
Adjusted R ²	.696			
F- Statistic	32.500			

Source: SPSS RESULTS

TABLE 4.4.1

BENCHMARK (TABULATED VALUES) USING TWO- TAIL TEST

Table F- Statistic F 0.05 (1, 200)	3.84
Table F- Statistic F 0.01 (1, 200)	6.63
Table Value t-value t 0.05 (a, b-1)	1.960
Table Value t- value t 0.01 (a, b-1)	2.576

Source: Gujarati, (2005). Essentials of Econometrics, Boston: McGraw Hill.

- a. Predictors: (Constant), MACROMAN
- b. Dependent Variable: CAPDEC

TABLE 4.5

LEAST SQUARE REGRESSION RESULTS – MACRO-MANIPULATION, SHARE PRICE PERFORMANCE, ASSET ACQUISITION AND CAPITALIZATION DECISION AS MANAGEMENT DECISION PROXY

Variables	Estimated Coefficient	Standard error	t-value	Sig.
Constant	4.890	.620	7.887	.000
SHPRIPERF	.116	.084	1.393	.165
ASSTACQD	.108	.065	1.670	.096
CAPDEC	.066	.070	.944	.346
R	.847			
R ²	.717			
Adjusted r ²	.679			
F-Statistic	21.452			

Source: SPSS RESULTS

TABLE 4.5.1

BENCHMARK (TABULATED VALUES) USING TWO TAIL TEST

Table F- Statistic F 0.05 (1, 200)	3.84
Table F- Statistic F 0.01 (1, 200)	6.63
Table Value t-value t 0.05 (a, b-1)	1.960
Table Value t- value t 0.01 (a, b-1)	2.576

Source: Gujarati, (2005). Essentials of Econometrics, Boston: McGraw Hill.

- a. Predictors: (Constant), CAPDEC, SHPRIPERF, ASSTACQD
- b. Dependent Variable: MACROMAN

5 DATA ANALYSIS

This section is concerned with the analysis of data gathered for the study as well as analysis and discussion of findings.

Table 4.1 shows the distribution of questionnaires to five (5) commercial banks, which constituted the sample. From the table it could be deduced that out of the 1000 questionnaires administered, only 800 constituting 80% was returned while 200 representing 20% were not returned. The table shows that Intercontinental Bank returned the highest number of questionnaires totaling 180 representing 90%, followed by Union Bank and Afri-Bank that returned 170 and 160 representing 85% and 80% respectively. Similarly Fin Bank returned 150 and Oceanic Bank returned 140 questionnaires representing 75% and 70% respectively.

Table 4.2 to 4.5.1 list the variables used in the analysis. They are: Share price performance (SHPRIPERF), Assets acquisition Decision (ASSTACQD) and Capitalization Decision (CAPDEC) as the dependent variable while Macro-manipulation (MACROMAN) is the independent (explanatory) variables.

In addition where multiple regression result are presented, the estimated Pearson correlation coefficients, standard errors, t-value and the coefficient of determinations are arranged vertically for creative accounting variables. The t-value is calculated using a two-tail test. The level of significance of 5 percent is used. For five percent level of significance, this means that there are 5 chances in 100 that the hypothesis tested would be rejected when they should actually have been accepted. This means that the researcher has 95 percent confidence that the results are not due to chance. The standard error of the estimated

parameter indicates how much the estimated parameter is likely to be affected by random factors. The t-value of the estimated coefficient is relative to its error (Gujarati, 2005).

Other necessary statistics are equally presented, namely the coefficient of determination (r^2), the adjusted r^2 and f-statistics. R^2 measures the goodness of fit of the regression equation, that is, it gives the proportion or percentage of the total variable in the dependent variable explained by the explanatory variables. Adjusted r^2 is a better goodness of fit as it adjusts for increasing r^2 when a new explanatory variable is added to the model, f-statistics is used to test whether the regression equation taken as a whole, does significantly explain the variation in the dependent variable.

5.1 MACRO-MANIPULATION/SHARE PRICE PERFORMANCE

The result shows that the constant term has positive sign, which is consistent with theory. The estimated coefficient for macro-manipulation is also positive which is consistent with economic theory that there is a positive relationship between macro-manipulation and management decisions measured by share price performance. By implication, it means that a company experiencing high macro-manipulation would enjoy high level of share price performance. The t-values of the estimated coefficient were high and significant. High t-values are indicators of high reliability of the predictive power of the coefficient.

The adjusted r^2 is 74.2 percent. The goodness of fit is good and statistically significant. This implies macro-manipulation of financial statement linear relationship with share price performance is strong.

The F-ratio is 24.000, and this is very high and statistically significant, it is higher than its theoretical values at 5 percent level of significance. The F-ratio confirms that share price performance is statistically related to the independent variable in the model.

5.2 MACRO-MANIPULATION AND ASSETS ACQUISITION DECISIONS

The results show a high positive sign for the constant term that is in line with economic expectation. The estimated coefficient is 10.3 percent. This means that every unit change in average rating of macro-manipulation of financial statement may lead to 10.3 percent change in assets acquisition decisions. The t-value is high and indicates statistical significance at 5 percent level.

The adjusted r^2 is statistically significant. The coefficient of determination is 84.1 percent. This means that 84.1 percent of the variation in assets acquisition decision is explained by the explanatory variable included in the model. The F-statistics is 21.679. This is very significant and expectable. It is higher than the theoretical values at 5 percent level of significance. The F-statistics confirms the significance of the adjusted r^2 .

5.3 MACRO-MANIPULATION / CAPITALIZATION DECISION

The multiple regression result shows that the constant term has a positive sign, which is consistent with theory. The estimated coefficient of macro-manipulation with capitalization decision is significantly positive. The important implication of this result is that holding other explanatory variables constant, an increase in one (1) unit of macro-manipulation of financial statement may lead, on average, to an increase of 0.051 or 0.51 kobo in capitalization, all things being equal.

The t-value of macro-manipulation of financial statement is small and statistically significant. The adjusted r^2 is statistically significant. Its coefficient of determination is 72.3 percent. This indicates a very strong relationship between macro-manipulation of financial statement and capitalization decision by management. This means that 72.3 percent of the variation in capitalization decision can be explained by the explanatory variable (i.e. macro-manipulation of financial statement). This is a good fit.

The F-statistics is 32.500 and this is very high and statistically significant. It is higher than the tabulated value of 5 percent level of significance. This confirms that capitalization decision is statistically related to the independent variable included in the model at 5 percent level of significance.

5.4 SHARE PRICE PERFORMANCE (SHPRIPERF), ASSETS ACQUISITION DECISION (ASSTACQD) AND CAPITALIZATION DECISION (CAPDEC)

The multiple regressions of capitalization, share price performance and assets acquisition decision show a very high positive sign which is consistent with expected economic concept for the constant term therefore indicating positive relationship between macro-manipulation of financial statements and capitalization decisions, share price performance and asset acquisition decisions as management decisions. Positive signs were also found for share price performance, assets acquisition decisions and capitalization decisions.

The estimated coefficient indicates that a unit change in macro-manipulation of financial statement may lead to 11.6 kobo increase in share price performance, 10.8 kobo in assets acquisition and 6.6 kobo in capitalization.

The coefficient of determination is 71.7 percent, while the adjusted r^2 is 69.81 percent. This means that 69.81 percent of the combined variation in share price performance, assets acquisition decisions and capitalization decisions can be explained by micro-manipulation of financial statement as contained in the model. The F-statistics is 21.452. this is very significant and statistically high at 5 percent level of significance and confirms the significance of the adjusted coefficient of determination.

6 TEST OF HYPOTHESES

In this study, we have adopted both the statistical significant criteria as well as the theoretical expectation for accepting or rejecting the null hypothesis. The following hypotheses are restated here:

1. Ho1: Macro-manipulation of financial statement does not significantly affect share price performance.
Ha1: Macro-manipulation of financial statement significantly affects share price performance.
2. Ho2: Misreported assets and liabilities do not significantly affect assets acquisition decisions.
3. Ho3: Macro-manipulation of financial statement does not significantly affect capitalization decisions.

7 RESULT PRESENTATION AND ANALYSIS

Result or ordinary least square estimates of creative accounting factor are given below:

1. SHARE PRICE PERFORMANCE (SHPRIPERF)

$R = 0.870$ $R^2 = 0.759$ Adjusted $R^2 = 0.742$

F-Ratio = 24.00 t-value = 14.016

Sig. 1-tail = 0.000

Sig. F-ratio = 0.000

Tabulated values: F 0.05 = (1, 200) = 3.84

F 0.01 = (1, 200) = 6.63

t- 0.05 = (a,b- 1) = 1.960

t 0.01 = (a,b-1) = 2.576

2. ASSETS ACQUISITION DECISIONS (ASSTACQD)

$R = 0.917$ $R^2 = 0.841$ Adjusted $R^2 = 0.813$

F-Ratio = 21.679 t-value = 9.183

Sig. 1-tail = 0.000

Sig. F-ratio = 0.000

Tabulated value: F 0.05 = (1, 200) = 3.84

F 0.01 = (1, 200) = 6.63

t 0.05 = (a,b - 1) = 1.960

t 0.01 = (a,b - 1) = 2.576

3. CAPITAL DECISION (CAPDEC)

$R = 0.850$ $R^2 = 0.723$ Adjusted $R^2 = 0.696$

F-Ratio = 32.50 t-value = 12644

Sig. 1-tail = 0.000

Sig. F – ratio = 0.000

Tabulated value: F 0.05 = (1, 200) = 3.84
 F 0.01 (1, 200) = 6.63
 t 0.05 (a,b – 1) = 1.960
 t 0.01 (a,b – 1) = 2.576

In response to the first hypothesis, the researcher undertook a study to observe whether or not there exist any statistical relationship between macro-manipulation of financial statement and share price performance. The results show that the estimated coefficient of macro-manipulation and share price performance was positive which is consistent with macroeconomic theory. Based on this result, it was necessary therefore to conclude that there is a statistical significant relationship between macro-manipulation of financial statement and share price performance of firms. The F-ratio result also confirms the coefficient of determination while the t – value indicates that there is statistical significant relationship between macro-manipulation of financial statement and share price performance. Therefore, the null hypothesis stands rejected.

For the second hypothesis, the researcher undertook to study whether or not macro-manipulation of financial statement measured by misreported assets and liabilities is statistically related to assets acquisition decisions. The result shows a positive sign for the constant term indicating a positive relationship between the variables in the model. The significant coefficient of determination leads to the rejection of the null hypothesis as confirmed by the high F-statistics establishing a significant statistical relationship between misreported assets and liabilities and asset acquisition decisions.

In the third hypothesis, the estimated coefficient of determination was positively high which is consistent with economic theory. The F-statistics that is statistically significant confirms the consistency of the relationship between macro-manipulation of financial statements and capitalization decisions. In the light of the foregone result, it could be conclusive that there is a significant statistical relationship between macro-manipulation and capitalization decisions. Therefore, the null hypothesis stands rejected.

8 DISCUSSION OF FINDINGS

In the analysis of the data, the researcher made the following findings:

Macro-manipulation of financial statement significantly affects the performance of firm's share and management decisions relating to their firm's shares. This confirms the findings of Stolowy and Breton (2003) which identified that the fundamental principle which underlines macro-manipulation is based on the aim of publishing financial information is that to reduce the costs of the enterprise projects financing. But this reduction depends on the risks to transfer the riches as they are perceived by the agents on the market.

Misreported assets and liabilities in the financial statement significantly affect management decisions relating to the acquisition of assets and liabilities. The finding revealed that real causes of creative accounting lie in the conflicts of interest among different interest groups. Managing shareholders' interest is to pay less tax and dividends. Investor-shareholders are interested to get more dividends and capital gains. Country's tax authorities would like to collect more and more taxes. Employees are interested to get better salary and higher profit share. But creative accounting puts one group or two to advantageous position at the expense of others. One day the present authors had an opportunity to have a discussion with the Chief Accountant of an enterprise in this regard. The Chief Accountant told, in the course of conversation, that he was determined to retain profit for the expansion of his existing unit and establishment of new ones. Quite naturally, his interest was to pay less tax and less dividend and, accordingly, to 'create' financial statements. This type of creative accounting has led David Schiff (1993) to warn investors; in general that taking a company's financial statements at face value can be 'a recipe for disaster.'

The study also linked capitalization decisions with macro-manipulation of financial statement. This result confirms the outcome of the study of shah (1996), MacBarnet and Whelan (1999) and Merchant and Rockness (1994). They all in different works identified a strong relationship between capitalization decision of firms and financial statement manipulations.

The manipulation of financial statements and reports were found to have significant effects on the management decisions of assets acquisition, capitalization and share price combined together. This finding is in line with the outcomes of the studies of Markarian & Pozza (2008) which was based on empirical researches referring to motivational factors of the earning manipulation.

The study further found that preparers of financial statements are interested in creating the financial statements that suit their own purposes which of course, they may genuinely feel that their view of economic reality is preferable from all points of view and however, seek to distort the picture of the financial report through macro – and – micro-manipulation to meet their own needs Merchant & Rockness (1994).

Furthermore, preparers of financial statements expect to earn certain reward for their engagement in creative accounting. Some of desired rewards are an upward move in a firm's share price, to improve debt ratings and reduced interest costs on borrowed slack and reduce restrictions from debt covenants. An interest in boosting a profit-based bonus was also found to be a significant driver for financial statement manipulation as revealed by the findings of (Whelan, 1999). Finally, for high-profile firms, the motivation may be lower political costs, including avoiding more regulation or higher taxes which affects decision making by managers, investors and other stakeholders.

CONCLUSION

Arising from the foregoing findings, the researchers wish to draw the following conclusion. Creative accounting affects a firm's share price and capital market performance as a result of macro – manipulation of financial statement. It also affects effective management decision to require new assets or replace existing ones. The practice can lead to tax evasion and can cause investors to lose their hard earned money.

RECOMMENDATIONS

I hereby recommended that effective regulation of financial reporting should be encouraged to minimize misrepresentation of facts. The tenet of good covenants should be the watch word in ensuring abuse of financial statement. Finally, management of firms should try to base their investment decision on financial report that has not been manipulated.

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