VOLUME 5 NUMBER 4 Nov 2013
ISSN 2076-9202 (Print)
ISSN 2218-046X (Online)

International Journal of Information, Business and Management

ELITE HALL PUBLISHING HOUSE

International Journal of Information, Business and Management

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ISSN 2076-9202

International Journal of Information, Business and Management

Publisher: Elite Hall Publishing House

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Web: http://ijibm.elitehall.com
ISSN 2076-9202 (Print)
ISSN 2218-046X (Online)

Literature Review of Joint Liability, Individual Liability in Micro Finance Institute and Their Impact on Default Rate

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ABSTRACT

Microfinance institutes (MFI) have introduced joint liability model, where the social cohesion is undertaken as the collateral for the provision of loans. The threat of the non provision of further loans ensures the group members to enforce all members of their group to repay the instalment, resulting in decrement of default rate. The joint liability is majorly impacted by adverse selection, peer monitoring and moral hazard. Study also identifies various factors for both individual liability and joint liability with respect to default rate. Review of literature of individual and joint liability models is undertaken and theoretical driven model is built with factors which impact both joint liability and individual liability in terms of default rate. Loan size, interest rate and cost of operations have been found to be active factors impacting default rate for both the joint liability and individual liability.

Key words: Adverse Selection, Assortative Matching, Default Rate, Individual Liability, Joint Liability, Moral Hazard, Peer Monitoring, Social Collusion

INTRODUCTION

Microfinance has been the one of the common tool that developing economies have put in use in order to provide the financial formal infrastructure to the poverty part of the society. The active organisations have been capitalised by the subsidies and the government in order to provide the various loan products to the clients. However the recent debate over the sustainability of these organisations has made both practitioners and researchers to look into the different alternatives for the better return generation.

The joint liability scheme is one of the alternatives found which could be implemented and has generated mixed results in the terms of success. That is, it has been successful in few locations and has been failure at few locations. Hence this has raised interest in the various researchers to explore and study the factors

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responsible for both the success and failure of the joint liability schemes around the world. This paper is an attempt to understand the concepts involved in the joint liability scheme and identify the factors which directly or indirectly impact the performance on the repayments. At the same time also find the factors which differentiate the joint liability property from the individual liability.

The joint liability has been successful implemented in the Bangladesh for decades. The target clients had possessed no physical assets in order to provide as collateral for loans to lenders. This has made microfinance institutes to undertake the social cohesion as the collateral for the loans provided. Hence the client's need to form the groups in order to apply for the loans from the lenders where every member would be eligible to undertake a loan, however default of an individual needs to be repaid by rest of the group members in order to continue the relationship with the lender as described by Banerjee, Besley, & Guinnane (1994).

Malgosia Madajewicz (2004) paper explains that the significance of the individual versus joint liability scheme depends also on the level of development of the society. In the poor society the individual would not be eligible for the individual loan scheme as due to the absence of the credit rating and hence would be able access only through the group credit. Here in the group credit it is the joint liability which is undertaken as the collateral for the loan provision where as in the developed society, an individual would be able to access the higher loan amounts only in individual liability scheme. As the group credit would not be able to meet the requirements like progressive increment in the loan amounts etc.

LITERATURE REVIEW

Individual liability

The traditional loan format is the provision of loan to the individual on the basis of credit history of the individual possessed. This process involved in the individual possessing the historical records of the loan repayments. These types of loans have required providing the assets rights of individual to the lender as collateral for a value of loan amount provided. However this elongated process has resulted in the inaccessible of the loan services to the lower part of the society as explained by Aghion & Morduch (2000).

Direct monitoring of individual clients

In the provision of loans to the individual person the monitoring is undertaken by the lender. Lender undertakes the job of evaluation of credibility of the client, monitors the repayments made by the client all through the tenure of the loan.

Regular repayment schedules

The individual loans are provided on the basis of the fixed payment schedule which involves the

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repayment in the instalments periodically.

Non refinancing threats

The individual are also threatened for non provision of the further loans on partial or full default of the present loan instalments.

Collateral security

These loans include the condition for a client to provide with the valuable assets for the value of partial or full amount of loan as the collateral in order to attain the loan amount.

Joint Liability

The community development activities have looked in to the possibility of the provision of loans to the lower part of the society in a group or joint liability schemes. This scheme involved in the provision of the loans to the individual on the basis of the surety from the other group members as the collateral. Many of the NGOs and the government organisations in the developing nations have heavily depended on the joint liability to serve the lower part of the society. Hermes & Lensink (2007) paper describes the basic model used which was to provide the loans to the group of people either at once to all the group's members or in parts. However the critical criteria general laid were to non provision of further loans to all the members of the group in case of default by one or more members of the group.

Availability of the local information in the joint liability provides the advantage of lower costs incurred in the monitoring by the lending organisation as explained by Besley & Coate (1991). That is the selection and formation of the groups are self selected by the group members and the monitoring is also done by the members as local information available by the members would make them better at the responsibility of monitoring. At the same time all these activities of the members would lead to the lowering of the costs to the lending organisation as informed by Ghatak (2000).

Ahlin & Townsend (2007) paper explain Joint liability has been better functioning when the group members who were highly familiar and also ready to punish the member on default. However not every culture would have the same phenomena and hence the group credit with joint liability will be successful only in the communities who would be interested in punish rather than looking at the individual preference**.** The joint liability scheme also fails when group members find that the other members are defaulting irrespective of monitoring. Then the rest of the members would also defaults as they would be rejected the further loan irrespective of present performance. At the same time in the cases of the presence of the insurance for the loan portfolio would also encourage the clients to involve in the higher risk projects and less concerned towards the repayment of the loans as described by Karlan (2005).

Zeller (1998) has reported that group formation and the monitoring skills need to be inculcated among the

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client of the micro finance and this needs an investment. As these training program forms the major chunk of investment at the same time the probability of switching by the members to alternative funders might put away the private lending organisations in accepting the first timers.

Ahlin & Townsend (2007) informs that models relating with the Besley and Coate model of social sanctions and Ghatak model of peer monitoring have been found in increment in repayments by the individual in group credit scheme.

The joint liability phenomena is attempted to explain by various number of models by different authors. The major models can be summarized in to the categories using the subjects titled moral hazard, adverse selection and peer pressure as described by Ghatak & Guinnane (1999).

Stiglitz (1990) has provided the analytical analysis of the joint liability versus the individual liability in terms of deriving the interest rates on the basis of type of liability scheme.

- Y be the revenue generated from a business
- C be the amount of loan undertaken
- P is the probability of the business is success full and makes the individual to repay the loan
- R and r are the interest rate amount which can be charged

Case 1: when the loan amount is provided on the basis of individual

$(Y - r) - C > P * (Y - r)$

$\Rightarrow \quad r < Y - (C / (1 - P))$

Case 2: when the loan amount is provided to two individual on the basis of joint liability

$2 * (Y - R) - 2 * C > P*P * (2 * Y - 2 * R)$

$\Rightarrow \quad R < Y - (C / (1 - P * P))$

Since $(1 - P) < (1 - P*P)$ {as $0 < P < 1$}

Hence R will be always more than the r

i.e. interest charged in the joint liability would be always higher than the interest rate changed in the individual liability scheme.

Assumptions:

P is probability of success is considered consistent among all the parties

Phases of joint liability scheme

The three major steps involved in the process of issuance of loan to the retrieving the instalments are Screening, Monitoring and Enforcement. These steps have got a very significant distinct characteristic in

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the joint liability scheme as compared to the individual liability scheme. The further section provides the brief introduction of these phases

Screening

Screening process forms the initial step in the loan processing. In this step the evaluation of the prospective and convert the individual into the client. However in the joint liability the plethora of information of an individual is available with all members of group. This leads to the formation of the groups on basis of assortative matching i.e. the generally the like risk people forms the group on providing the option of self-selection of the group members Wenner (1995). The group member's pressure would result in the better loan repayment and this result in attaining the expected profits. The interest rates are also defined on the basis of the credit rating of the total group. Lower credit rating group is generally provided at higher interest rates.

Monitoring

Wenner (1995) also says that since all the group members belong to a particular single location and hence this provides them with both the formal and informal interaction with the other members of the group. This leads to generate lot of information of each individual with all the group members. The information possessed by the group members provides the additional effectiveness in monitoring of the fund utilisation, repayments of an individual by the group members.

Enforcement

Majority of the funding agencies have continuously used termination threat i.e. on partial or total default of the instalment payment by a group member or members would lead to further loan provision to all the members of the group.

The second channel of management of the enforcement of the repayment is by group characteristics establishment as provided by Wenner (1995):

- Social and cultural cohesion formed in the group provides the peer pressure on an individual to repay the instalments without default.
- The leadership of the group leader also impact upon the repayments. As they help in the commitment in the surplus resources by the all the members in case of default scenario.
- Finally the group size also impacts the leadership and the social and cultural cohesion of the total group.

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Activities undertaken by lenders by MFI's

The specific steps which are generally undertaken by the MFIs especially in joint liability scheme in order to increase the repayments as per the Aghion & Morduch (2000) are:

- The instalment repayment and other transactions by the individuals are conducted in the public in order to provide a social stigma which results in lower defaults
- The joint liability and group credit ensures in information flow of each and every individual and prevent the defaults. At the same time the peer pressure results in on time payments of instalments
- The collection of the instalments are undertaken by the field officers who need to be flexible and provided with the mobile collection centres
- The groups are provided with business venture training which results in the boost up of the entrepreneurial activities by the individual both at the individual and group level
- There has been the higher impact and effective utilisation has been found in the women gender in these schemes

Agency problem

Agency relationship is a contract in which the decision making is delegated to the agent on behalf of principal. However the agency problem arises when there is a mismatch between the objectives of the principal and agent. In the microfinance the creditor is the principal and the clients are the agents. The loan provided to the agent on the basis of the historical performance of the individual in the individual loans where as in the group credit it is the social relations is undertaken as the collateral at the same time all the group members forms as the agents. The monitoring and contract enforcement costs would be driven upon on the basis of the significance of the agency problem involved as explained by Adams (1995).

Peer monitoring (Transaction costs)

Adams (1995) also describes that the transaction costs are increased with the increase in size of the organisation as due to increase in administrative costs, professional skill, maintenance of records etc. The lower agency problems would lead to lower amounts in transaction costs.

As the group size increases leads to increase in the peer monitoring costs and hence results in the higher cost accumulation especially because of the higher probability in increment in the number of free riders as explained by Armendariz de Aghion (1999).

Higher costs involved in the monitoring increase the performance and returns of the loan portfolio in an

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individual loan scheme. However after threshold the increase in the interest rates would result in the lowering of the demand of the individual loans and hence results in the overall decrement in the profits. However in the case of the group loans, the increase in the administrative costs is not directly correlated with the returns and hence the increased costs in monitoring by an organisation would not be helpful in increasing the returns. However with the increasing the loan size would lead to lower costs occurrence and results in increase in the profitability of both the individual and joint liability scheme. However in the process of increment in loan size the reach ability would be traded off in the case of the individual loan as informed by Cull, Demirgu¨ç-Kunt, & Morduch (2007).

Zeller (1998) also says that the costs of the information are less especially in the case of socially cohesive groups. That is the monitoring is highly effective in the groups having the collusiveness and at the same time good at the implementing rules and regulations on defaulting member.

Moral Hazard

The collusion between the group members may lead to the negative impact on the performance of the loan and hence lender could be risk of losing the portfolio. However the lender would be able to make optimum level of returns only when the group credit is provided and the information flow is between the members. At the same time the members need to monitor and enforce the commitment to each member. Hence the group credit would perform better over the individual credit scheme as due to the group skills in monitoring and enforcement in repayments as described by Laffont & Rey (2003).

The below model explains on the three fronts of individual, group without sharing information and group with sharing information.

Individual

- P1 is the probability of success on application of effort by an individual
- P2 is the probability of success without addition of effort
- C is the cost incurred by an individual for addition of effort
- X is entrepreneur share of output
- Z is the output of the business
- r is the cost of funds for the bank

The assumption is on application of additional effort the probability of success raises, hence P2 > P1

So for an individual the return on application of effort is (P1 * X) – C

Whereas without addition of effort is (P2 * X)

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So (P1 * X) – C > (P2 * X)

Hence the bank provides the loan only on addition of efforts by the individual, so the function the bank undertakes is

Maximize P1 * (Z – X) – r

With two major constraints

P1*X – C > P2*X this is known as incentive constraint ----- > equation 1

P1*X – C > 0 this is known as participation constraint ----- > equation 2

From equation 1 X = C / (P1 – P2)

Applying the value in equation 2 we get P2*C / (P1 – P2) as the minimum rent which bank has to provide to the client in order to client to involve successfully apply the effort and payback the repayments

Group (when unknown)

In the case non sharing of information

The condition of (P1 * X) – C > (P2 * X) remains same whereas due to the group members and the output to individual share comes to (P1*X + (1 – P1) * Y) with an assumption that the only one person business is successful in a group of two member. (Y is the output share of the second individual)

Since the incentive constraint in this also same as the individual and hence with the non flow information the loan scheme acts as no different from the individual loan scheme.

Group (when known and collusive in behaviour)

X - When both the members success in the project and get the returns to individual share

Y - When only member success the project and get the returns to individual share

The utility is P1*P1* X + P1* (1-P1) * Y – C is when both the members put the effort

When the effort is not applied P2*P2* X + P2* (1-P2) * Y

With incentive constraint application X = C / (P1*P1 – P2*P2) and Y = 0

And applying the values in the participation constraint P2*P2*C / (P1*P1 – P2*P2) is the amount of rent which bank needs to let go for the members to actively involved in the returns generation in business and provide repayments to the lender.

As the above three sub proofs provide the optimum returns to the group and least rental paid by the lender to individual is in the case of group credit with collusive behaviour.

Adverse selection

The two parties involved in the loan process are the lender and borrower. The lender would be implementing the conditions in the contract which would be optimum for the returns earned on the loan amount, where as the borrower would accept only on the have capability of generating the residual earning (amount left after the repayment). At the same time earning the returns by borrower which are in line with the individual objective would result in the incentive and hence motivates to put in the higher

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hard work into the business (where the loaned amount is invested).

The previous paragraph briefed the loan process but the information about the utilization of the loaned amount by the borrower forms the major bottleneck in the process. Three scenarios can occur on the basis of information availability to the lender.

In case 1 the information is available then the lender has the lower risk of default of the repayment and hence the interest rates provided is at lower end (the costs incurred in collecting information is zero is assumed).

In case 2 the information is not available or public and hence the borrower could move to the projects with higher risk resulting higher defaults and hence the lender prefers to provide the loans at higher costs.

However in case 3 the monitoring is undertaken by the lender on the borrower and hence incurs high costs resulting in provision of loans at high costs. Where as in the joint liability scheme the monitoring undertaken by the group members and hence the costs are lowered. At the same time the all the members would be held responsible for the default of any single member and hence the default rate in joint liability is very low.

There are two major factors involved in the joint liability for a lender to consider understanding and overcoming the adverse selection. Firstly is to find the *type of group* i.e. whether the group belongs to high risk or lower risk. Secondly the *formation of the group* whether risk is heterogeneous or risk is homogeneous among group members. The interest rates charged would be depending on the riskiness of the group. Higher the group riskiness higher interest rates are charged. Hence the safe members would be inclined towards the formation of the group with the safe members than with the risk members in order to prevent from paying the instalments of defaulting members. This leads to the risky individual to form the group with the risky individual and hence the interest rates charged is higher.

Laffont (2003) paper finds that the with the provision of the communication and information flow between the group members would lead to the optimum levels of rental paid by the banks to the members at the same time would be able successfully overcome the adverse selection problems provides right interest rates to group loans. However in the absence of the information flow due to lack of social collusiveness would lead to the performance which will be no different from the performance of an individual loan scheme.

Assortative matching

The low risk project members would be forming the group with the low risk members as due to the high conformity of certain cash flows in the projects and hence the regular repayments whereas in the case of the risky members the probability of failure of the projects is high and hence the group members have high risk in repayment of the instalments. However in the case of risky projects, returns are high and hence the successful member would be ready to pay higher repayments. Hence there is clear formation of

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the same risk customers in the same group. This would help in providing the lower risk groups with lower interest rates and higher risk group with higher interest rates as detailed by Ghatak (1999). Ghatak (2000) adds a point that the formation of the groups on the basis of homogeneous risk is also said as the positive assortative matching**.**

Factors of Joint liability

The study of different factors impacting the joint liability is required to understand and apply the same in the real time. Various authors have undertaken both the theoretical and empirical to identify the factors. The literature survey provides these following factors

Size

The size of the group is found to be major impact on the social relationship. As the increment in the size it leads to diversification of the risk at the same time the contribution levels are decreased. Abbink, Irlenbusch, & Renner (2002) Paper has lower pro towards the higher size leading to lower risk. There is always the trade-off between the larger group size (which results) free riding to the lower group size (lower monitoring, lower information asymmetry) as supported by Armendariz de Aghion (1999)**.** Gomez & Santor (2003) paper found the size forms the important factor in the peer monitored loans**.**

Cull, et al., (2007) explains that with the increment in size the profitability of the portfolio is increases however would not increase in the costs and hence the joint liability works more efficiently in increasing the loan size**.**

Gender

The gender has got the impact on the performance of the loan repayment and it is generally found that the women have high will in maintenance in good track record of the repayment of loan in group as informed by Abbink, et al. (2002).

Familiarity

The higher the familiarity, lower is the default rate as it seems to be that the stronger relationship is less in acceptance of the free riding. However Abbink, et al. (2002) paper finds very less difference between the performance of the groups with familiar member group and non familiar member groups.

A social tie with the punishing culture has only successful in increasing the repayment rates where as the failed in the societies where the strict isolation punishment is not imposed as supported by Ahlin & Townsend (2007)**.** Wydick (1999) explains the familiarity in the each other members business performance would result in the better monitoring and hence results in the increase in the performance of the repayment.

Homogenous

Karlan (2005) explains that with the increase in the homogeneousness would lead to increase in the better observation of the group members, monitor and effectively undertake the commitment in the loan

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repayment**.** However there is also negative side all the group members could form a collusive behaviour and act against the organisation objective**.** Zeller (1998) paper finds that the individual with the similar risk would form a group**.**

Loan officer

The effectiveness of the loan officer has impact upon the joint liability efforts. Higher the activeness of the loan officer and number of group meetings conducted by the officer would directly impact the repayment of the group members. The increased meetings in the public would lead to the stigma of individual member to pay the instalment at the same time make all members to active monitor each other performance as explained by Gomez & Santor (2003).

Interest rate

Ahlin & Townsend (2007) in paper finds that the increase in the interest rate has negative correlation with the joint liability. It has been observed the increase in the interest rates resulted in good customers (low risk clients) to move out of the portfolio and increase in the higher risk customers. However this would result in increased revenues to the lender and also increases the sustainability.

Insurance

The involvement of the insurance or limited liability has observed to significant impact upon the group members behaviour on the performance of the repayment of instalments. This insurance has introduced the inefficiencies into the joint liability scheme.

Income

Even in the income of the family has an impact on the repayment of the loans. Zeller (1998) has found that the loans were repaid when the harvests were good and performed bad in the case of failure of crop. They have also outperformed the individual loans performance in the time of good crop as supported by Zeller (1998). That is the certainty of cash flow from the income would result in the better repayments of loans in the case of joint liability.

The wealth of individual would lead to the motivation of members to look out for the incentive obtained in the joint liability scheme. Laffont (2003) found that the higher wealth lowers the interest in the incentives obtained in the joint liability scheme. At the same time it also found that the individual would be more interested in investing loan from individual loans in the better business prospects and simple business prospects are fulfilled with joint liability scheme.

Distance

Wydick (1999) says that the distance in literal terms between the members would hold inverse relation with the repayment. That is the higher the distance between the members location would result in the lower performance in the repayment of the loans.

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Benefits of joint liability

Few of the benefits by the joint liability are cost sharing, commitment and joint responsibility as explained by Armendariz de Aghion (1999).

Cost sharing: the costs are shared by the both the lenders and the borrowers. Lenders would gain in terms of monetary (by saving selection and monitoring costs) and borrowers would paying in terms of non monetary that is by selection of members, monitoring the members utilisation of the loan amount and enforcement in the repayment of the instalments to the lender. Hence all these activities undertaken by the group members results in lowering the operational costs incurred by the lender.

Commitment: the monitoring and enforcement by the group members over each other would increase the seriousness in the loan utilisation for the productive activities. At the same time it also ensures the members to have better performance in the repayment of the loans.

Joint responsibility: this characteristic would help the group members to form groups and undertake activities which would benefit not only individual but also all the group members. This kind of group responsibility would increase the familiarity between the group members and also help them to improve their financial literacy about the day to day financial planning.

Positive assortative matching: would lead to the higher interest rates charged to the high risk groups. This process would lead to the high supply of loans to the high risk groups by the microfinance organisation as due to break even of costs and sustainability. This would lead to the safe groups to be out of loans but the same would be invited to the formal markets which are available outside as explained by Ghatak (2000).

Negative side of joint liability

The joint liability has also been observed to possess the negative impact upon the client segment. The researchers have constantly debated upon the fate of the defaulters of the loan in the joint liability scheme. The following are few of them undertaken from the literature:

Social isolation leading to further degradation: The social isolation leads to further degradation of the life standards and results are against the objectives of the microfinance. Montgomery (1996) suggests that social isolation should be replaced with flexible repayment schedules – that is providing the changed instalment amount and the dates, savings facilities – found to be effective increase of the performance of the individuals in repayments and increasing the number or customising the products like short-term, high-interest consumption loans so as to reach the actual requirements of the client.

Group credit would not be able to meet the client requirement as for progressive increment**:** The clients who have established the business on the basis of the loans would be looking out for higher amount of loan in every subsequent loan as the requirement rises with increase in the business size. However this would not be able to fulfil by the group credit as the different members would be requiring different

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amounts.

Incentive to the good member: Zeller (1998) informs that the timely repayment by the good customer would however lose the incentive as due to the joint liability i.e. the default by a risky member or free rider would also punish the good customer.

Free riding: free riding is the term used in many of the papers especially in order to refer to the member of the group who would be dependent on the other members for the repayment. That is would be enjoying the group benefits without contributing to the benefits to the group. The other group members would be undertake the extra burden in order to prevent the criteria of default which would result in ineligibility for the further loans in future as explained by Armendariz de Aghion (1999).

EMPIRICAL STUDIES

This section provides the empirical findings from various papers with respect to the relation between the variables influencing the default rate of Joint liability and Individual liability in the MFI's.

Result of empirical analysis in the Wenner (1995) study indicates that there is direct relation between the introduction of monitoring and selection leads to lower default rate or increase in the repayment performance. The increment in the monitoring and selection leads to decrement in the cost of operations of a lender.

Sharma & Zeller (1997) says that the introduction of more number of relatives in the group would lead to the higher default rate. This is due to the lenient monitoring by the team members. In this case the cost of operations is lower for the lender but the default rate is higher. The paper has also found that the self selection process leads to the better repayment of loans. Zeller (1998) does empirical analysis and states that the implementation of internal rules and regulations by the group members would lead to the better repayment performance that is decrement in the cost of operations of the lender and decrement in the default rate.

The increment in literal distance between the group members would lead to increment in the default rate and flow of information of the other member group members would lead to decrement in the default rate. As obtained from the empirical results by the Wydick (1999). Hence these activities lead to the decrement in costs of operations resulting in the increment in the repayment performance.

The empirical result obtained by Paxton, Graham, & Thraen (2000) states that the increment in the homogeneity of the group would lead to higher default rate. That is the same risk members forming a group would be less interested in monitoring and enforcement and hence results in the higher default rate. Alessandra, Luke, & Bruce (2007) says that the empirical test in regards to the default rate and the homogeneity and found the direct relationship. That is the increment in the homogeneity of the group

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members would lead to the higher repayment.

Hermes, Lensink, & Mehrteab (2005) finds empirically that the role of leadership in the group leads to the lowering or preventing moral hazard and hence results in the lower default rate. Karlan (2005) conducted one of the largest surveys and had undertaken the empirical analysis which consisted of 2000 surveys. It has been found that the individual with strong social interaction with both inter and intra members of the group would have higher repayment rate. Implies that the peer monitoring in the joint liability schemes led to lower default rate. Xavier & Dean (2009) found empirically that the comparatively individual liability to joint liability has no significant difference. There has been found the peer monitoring etc led to higher repayment rates.

Chowdhury (2003) has empirical result stating that removal of group liability has been found that the increment in the monitoring activities leading to the higher cost of operations in order to contain the default rate. Karlan (2005) empirical states that increase in the social ties and peer monitoring leads to the lowering of cost of operations of a lender, At the same time it also increases the repayment performance of the group members.

The empirical analysis of the Ahlin & Townsend (2007) states that variation of the income of individual or lower the average wealth at village level would lead to higher default rate.
Margaret Madajewicz (1999) empirical analysis undertaken in Bangladesh results reflect that the increase in wealth leads to the size of the loan in the individual and where as constant levels in the group loans. Group's loans have been found more productive in the lower income levels than the higher income levels this *be*cause the higher income members would undertake individual loan to invest in better return enterprise.

Empirical results of the Gomez & Santor (2003) find that the implementation of joint liability leads to the decrement in the lower default rates to a lender. The paper also provides the results specifying the significance of relationship between the default rate and loan size, social collusion, trust between the members.

All the above results have reinforced relationships used to build the model for the study of individual versus joint liability schemes on the characteristics of the loan size, interest rate and cost of operations and their impact upon default rate.

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SUMMARY

Paper reviews the literature on the microfinance, individual liability and joint liability. The absence of assets for collateral security by poverty part society has forced to search for the alternatives, joint liability is one among those. Joint liability has the social collusion as the collateral in order to obtain the loan amounts. However these loans are obtained on the group level and not preffered in individual level.

The joint liability has been explained by the various models naming moral hazard, peer monitoring and adverse selection. The self selection, monitoring and enforcement by the group members lead to decrement in both the costs of operations of lender and also the default rate. This resulted in the huge success of the joint liability scheme in the developing nations. That is joint liability has not only increased the outreach but also improve the quality of the portfolio.

The study has also identified factors for the joint liability from the literature. i.e. loan size, interest rates, insurance, cost of operations, social collusion, distance etc where as in the individual liability was impacted by the historical credibility, loan amount, income, wealth etc. The literature supports the joint liability on the both the sides. That is the joint liability has increased outreach, empowerment, lowering costs of operation etc but at the same time the social isolation led to further degradation of life index of poor, non ability to provide the progressive loan amounts, non ability of reward to the good member among poor peers etc.

In this paper a theoretical driven model (figure 1) is built relating the joint liability and individual liability with the factors identified in the literature survey. At the same time their mutual and composite impact towards the default rate. The hypotheses are to be built upon the comparative study of the joint liability and individual liability with identified factors.

The survey of findings of various papers have reinforced relationships used to build the model for the study of individual versus joint liability schemes on the characteristics of the loan size, interest rate and cost of operations and their impact upon default rate. However as the results are highly contextual and time specific, the significance of impact are varied in all the most of relations of the factors. This raises a necessity to undertake the research in the emerging economies to understand the characteristics of the relations built in the model.

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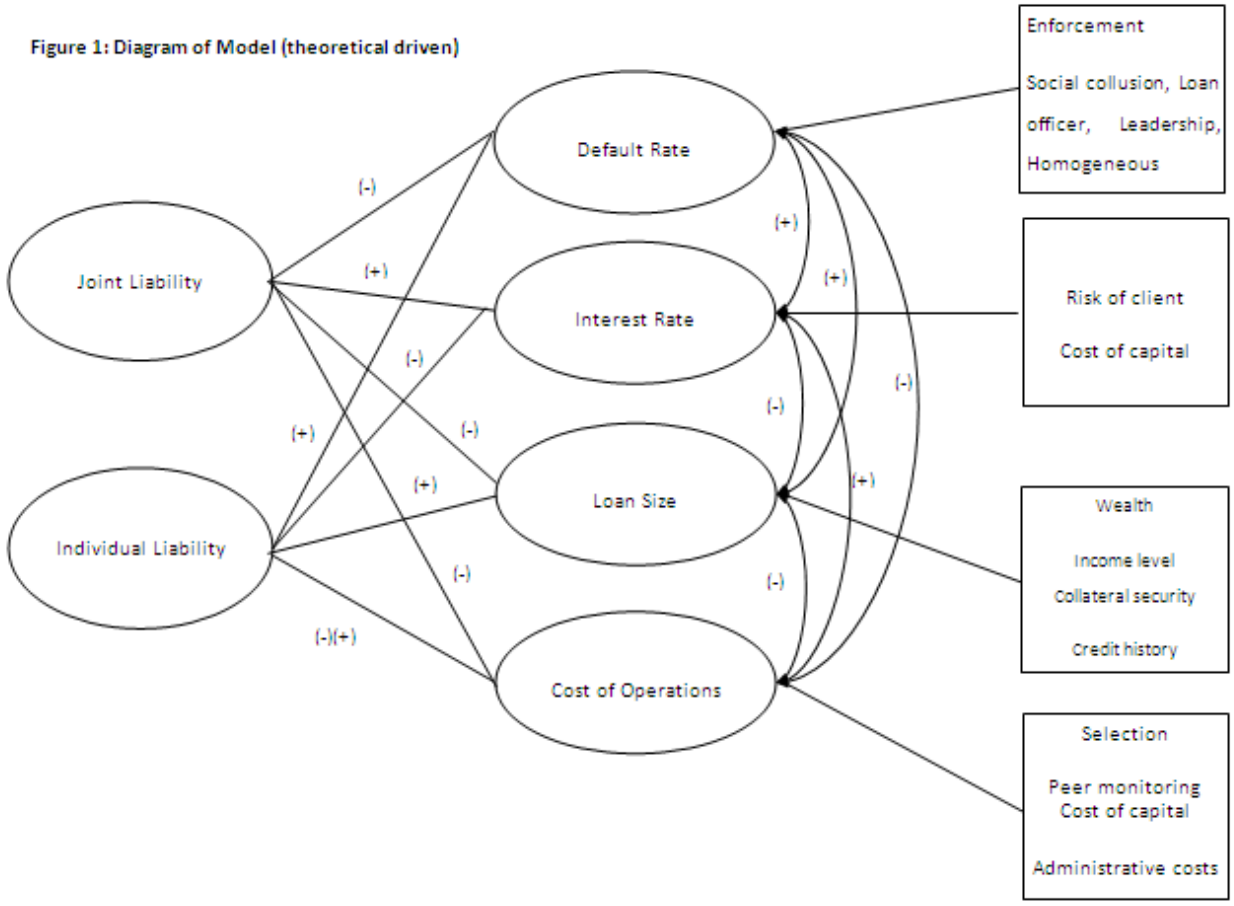
Figure 1: Diagram of Model (theoretical driven)



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ISSN 2076-9202

Factor's Weight of Importance in the Weighted Quality Score (WQS) Technique: CBD's Serviced Apartment*

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Abstract

This research attempts to enhance the reliability of Weighted Quality Score (WQS) technique by aiming to find factors that effect the market rent value in serviced apartments; to study the importance level of each factor that effects market rent value in serviced apartments; to study the statistical prediction power of factors that effect market rent value in serviced apartments and to propose reliable formulas in order to find the market rent value of serviced apartments. This research is a survey and cross sectional study. 346 samples were collected from the 4 areas of study a combination of the CBD, Central Lumpini, Early Sukhumvit and Late Sukhumvit in Bangkok Thailand via secondary data from websites and telephone contacts. Multiple regressions analysis with stepwise approach were applied in the study in order to test the relationships between physical set, amenities set, external set, management level factor and rent value. The results illustrate the factors of three sets, except the management level factor, have significant impact to rent value; especially room area, number of kitchen items and quality of furniture. Interestingly, proximity to subway or light rail is not the most influential factor as thought. Intangible factors such as service quality, building ambience, consistency of quality are recommended for further study.

Keywords: Appraisal, Valuation, Market Comparative Approach, Weighted Quality Score, WQS, Serviced Apartment

1. Introduction

Real Estate business is a multidisciplinary field that involves many professionals from pre construction (like feasibility planners and project designers) to post construction (like property managers). Appraisal is embeded both in pre and post construction. From the first day of a real estate project, appraisal is necessary for the developer in order to acquire the most proper and reasonable price for carrying out the project and for the last day of selling project, appraisal is also important for determining the competitive selling price (Jacobus, 2010: 295). Surely, if an appraised value is wrong or unreliable, the project is riskier and it will be very difficult to make a profit as expected and it will not only be risky for real estate firms but also lenders such as Banks or other financial institutes.

One of the characteristics of real estate is immobility (Jacobus, 2012: 27-30; Wurtzebach and Miles, 1994: 176- 187) however in term of economics; real estate moves all the times driven by the supply and demand of market.

This research was funded by Business Research Center (BRC) Faculty of Commerce and Accountancy, Thammasat University

ISSN 2076-9202

As a result, the value of real estate depends on several factors (Fritz, 1996: 78; Jacobus, 2010: 318; Wurtzebach and Miles, 1994: 176- 187) not only concerning brand or building design but also location, trends, demographics, natural disasters and many more therefore to appoint an absolute value for a property is nearly impossible. It is different in each appraisal view and technique thus a reliable standard of appraisal is significant. Different times and situations lead to different values; for example when the city has riots or terrorism, the property price tends to be lower in contrast to the proximal city where the property price tends to increase due to the migration of population. Another example is about the anticipations of buyers and sellers; floods in Bangkok during the end of the year 2011 shifted attitudes of both developers and consumers. The real estate price of flooded areas became lower because of the risks. Real estate can be devided in many categories as well as characteristics such as high or low rise project, 30- storey office building or 7- storey condominium, commercial or residential projects such as hotel and single detached houses. These characteristics have different attributes leading to differences in value (Guntermann and Norrbin 1987). Each characteristic such as floor level in condominiumor services in apartments relates to various factors impacting value while the importance of each factor is different. Real estate business and appraisals are obviously binded tightly. Appraisal in real estate business is different from other kinds of appraisal such as machines, equipment or antiques regarding its characteristics; lots of constraints are taken into account for example; buyers and sellers are not each acting prudently and knowledgably because normally real estate product is commonly bought not more than three times in a person's lifetime when compared to consumer products. As described, value is more than cost plus margin; it involves many factors; it is considered more than tangible assets. Also real estate itself has lots of unique characteristics therefore to apply an appraisal approach for each kind of real estate must be concerned.

Appraisal has various techniques depending on related factors (Kokinis- Graves 2006) such as time, data acquiring, and property types; one of many approaches is market comparative approach.The principle of market comparative approach is "the properties with exactly the same functions must have the same values". If the prices are different then no one will pay a higher price for the same building function (Pornchokechai 2012: 165). The procedures of market approach are to select the comparative property which is most alike to the subjected property then to adjust for related factors of the selected comparative property in order to reflect the value of the subjected rent. Therefore, market approach is the most suitable when comparative property data are available. One form of market approache is Weighted Quality Score technique or WQS. WQS technique is a doctrine aiming to determine related factors, the influence level of the factors and the comparatived property'scores in order to calculate the subjected property value. It is popular among Thai appraisers because of its simplicity and familiarity. Though WQS technique is inappropriate for direct appraising commercial properties such as hotels, shopping malls and serviced apartments, it supports an Income approach in terms of finding a proper market rent value which is stipulated by related factors (Frew and Jud 2003).

Unlike hotels and apartments, serviced apartments are a kind of real estate having longer duration of accommodation as well as different services from apartments. Nor market target, serviced apartments tends to catch expatriates who generally stay longer and need services. The number of expatatriates in Bangkok is growing every year (figure 1) therefore; WQS technique inclines more importance in the regarding of growing Income approach. Income approach can never be perfected without reliable rent or effective rent by WQS technique because rent can be concessive whether above or below market affecting to the distortion of value. If the value is distorted, the appraised value from an income approach is also unreliable.

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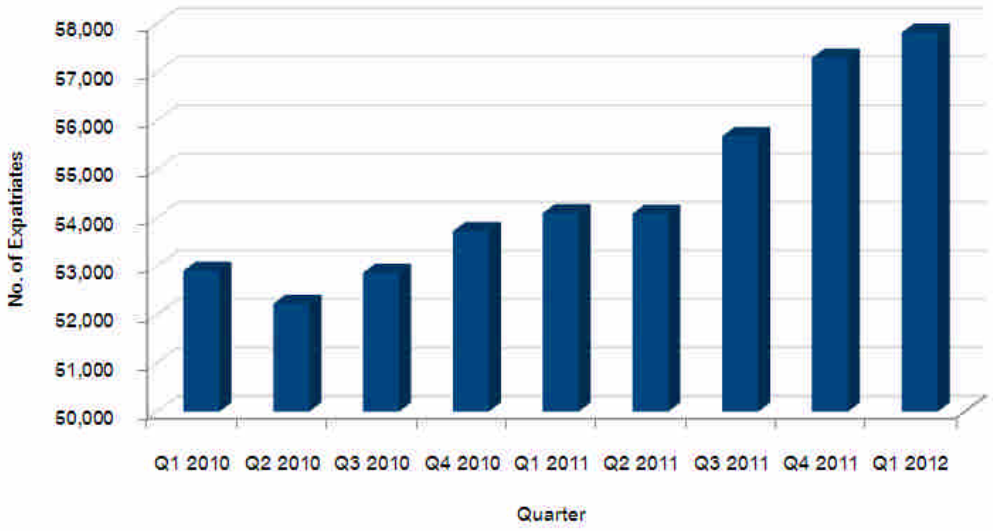

Figure 1. Number of expatriates in Bangkok during 2010-2012

Source Bangkok Serviced Apartment Report Q2 2012, Colliers International

Although WQS technique is widespread, it has obstacles in terms of reliability as well as consistency of analysis. WQS technique involves much consideration and morality of appraisers therefore prejudice may happen intentionally or unintentionally. WQS technic, by scoring by appraiser's experiences, has been questioned and challenged about its process's accuracy. For example; where do the related factors come from? Where do the factors loading come from? Where do the scores come from? How do score adjustments apply? And how to be sure that the provided factors explain property's value well enough? Currently, these questions have only practical guidelines without supported reliable procedures. Thereafter, it comes to the research topic of "Factor's Weight of Importance in the Weighted Quality Score (WQS) Technique: CBD's Serviced Apartment" in purpose of making advantages for Appraisal profession, Economy, Academy and stakeholders. On the other hand, the research results will be beneficial for real estate developers too in order to prioritize their importances of project investment for acquiring higher rent. The study was conducted with serviced apartments in theCentral Business District (CBD) in Bangkok due to its quick growth and unique characteristics which have never been studied before. It is convinced that factors in serviced apartments, hotels, apartments, and condominiums are likely to have different weights in each factor.

2. Real Estate Valuation

The concept of value has been studied from the17th – 18th centuries until today. In the early era, scholars gave critical attention to real estate only about land as one of the four economic ingredients. In1776, Adam Smith viewed value with the concept of natural price from calculating the cost of operation which is known as "Cost approach" today. During 1772-1823, David Ricardo studied the concept of Highest and Best Use, Land Residual Returns and the Laws of Diminishing Returns. All of these ideas have transformed to the concept of rent value which is today known as "Income approach". Last challenged concept is "Market approach" from the Neoclssical synthesis of Alfred Marshall (1842-1924). The concept regards supply and demand as economical mechanisms that locate market value. (Appraisal Institute, 2006: 30-32). Various views of value concepts has led to the understanding that each concept comes from from different contexts. Therefore to select the suitable approach for property appraisal is vital (Pagourtzi et al. 2003).

Property value depends on utility, scarcity, effective demand and transferability. These factors will lead to the explanation of

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serviced apartment's rent value. Another perspective of factors categorized as 1) Physical factors 2) Economical factors 3) Social factors and 4) Govermental factors ; is the evidence demonstating not only physical factors effecting value (Jacobus 2010: 318; Wurtzebach and Miles 1994: 176- 187). Moreover, Appraisal Institute (2006: 48- 50) raises environmental forces as also an important factor nevertheless, most appraisers appraise real estate value through only physical factors because it is more tangible comparing to other factors. Real estate appraisal is essential for property trading and other activities involving Bank or governmental organizations. To appraise property has various objectives; to set the appropriate selling or renting prices (Jacobus 2010: 295); to collect ad valorem taxation, to invest, to buy ongoing concern business or to determine insurance fees. (Appraisal Institute 2006: Pagourtzi et al 2003). As a result, to appraise serviced apartments with income approach with calculating net operating income (NOI) with different approaches or purposes will impact different property's value differently. Therefore the appraisal technique in this research will emphasize over market value which must follow these criterias 1) Renters and rentees aim to trade truly 2) Renters and rentees do well understand property information based on the purpose of maximizing profit 3) Availability of times to make a decision 4) Trade with cash or other equal forms of money 5) Renting price is a common price which does not generate other benefits except financial (Appraisal Institute 1996). This market principle is a frame to select samples in this study.

In conclusion, appraisal is the procedure of estimating property value. (Suengsilp 1995). The market rent value of property or real estate is not created by an appraiser. In contrast, rent value depends on many factors thereafter appraisal is only reliable technique to define market value under market constraints.

3. Rent Valuation of Real Estate with Market Approach through Weighted Quality Score (WQS)

Market approach does not involve business income or natural price like cost and income approaches. It is the concept relating to demand and supply which can be considered more open to environment. The principle is about dynamic market value that moves depending on the scarcity utility purchasing power and desire. It depends a lot on the market comparison thereafter it is proper to use with properties that can easily be compared such as condominiums, housing projects (Grave 2006), and apartments. Market approach is of unveiling market value which reflects every dimension of property such as age, design, utility or can be defined as "attitudes toward property".

In fact, market approach combines three techniques which are Direct Comparison, Sale Grid Adjustment, and Weighted Quality Score (WQS). All methods have same appraisal base of determining related factors which might come from interviewing buyers or rentees (Whipple 2006: 302). Then adjust the comparable properties in order to find subjected property value (Whipple, 2006: 302-305). However, market approaches still have unclear processes which are consecutively disclosed as following steps;

1) Find the comparable property and appoint the factors influencing value. Therefore, the criterias of selecting comparable property as well as factors must be clear (Wurtzebach and Miles 1994: 195- 196). In practice, appraisers always choose factors conforming to past appraisal reports without proper reasons. Therefore applied factors might come up with biases or other variances (Bantawkul 2007; Miller and Markosyan 2003: 181; Vandell 2007: 438)

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Table 1 Simulation of WQS technic (case 1)

Factors	Factors weight (100)	Score of comparable property	Total score of comparable property	Score of subjected property	Total score of subjected property
Distances to mass transit	50	4	200	1	50
Land area	20	3	60	5	100
Distances to main road	20	3	60	3	60
Facilities	10	5	50	3	30
		Total score	370		240
			Rent value		Rent value
			300		**194**

2) Weighting factors' importance, for example, location is given 0.5; accessibility is given 0.25; and facility is given 0.25 to total up to 1. The weight of importance depends on only the appraisers' opinion. The lacking ofproper reasons can harm the appraised value of property. As a result of different weights, simulated case 1 table 1 and case 2 table 2 point out that the same properties can be valued differently at baht 27 per sq.m. (around USD 1 per sq.m.) or 13.50 percent. This difference does not only impact to rent value but also impacts property value. The higher error of rent value is the higher error of property value.

Table 2 Simulation of WQS technic (case 2)

Factors	Factors weight (100)	Score of comparable property	Total score of comparable property	Score of subjected property	Total score of subjected property
Distances to mass transit	30	4	120	1	30
Land area	20	3	60	5	100
Distances to main road	25	3	75	3	75
Facilities	25	5	125	3	75
		Total score	380		280
			Rent value		Rent value
			300		**221**

3) Scoring comparable factors. This step builds higher variances of data in term of statistical analysis regarding statisticwise. In statistics, there are levels of data accuracy from nominal (lowest) to ratio (highest) scales. Most data are collected in ratio scales however with scoring techniques, the leveling down of data is manipulated. The lowest scale has been applied with the lowest reliability too.

4) Calulate total scores of each property.

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5) Use scores to appoint the subjected property. While more than one comparable property is conducted, appraisers must order least to most reliable properties by technique of inversion.

The above constraints lead to this research using Multiple Regression Analysis to support WQS technique. A huge advantage emerges in term of declining variances from bias and opinion of appraisers (Whipple 2006: 305). Analysis of serviced apartments in four areas of study reflects; 1) Factors truly relate to the property with significance of t value 2) Reliability level of all factors clearly shows appropriation of factor numbers with adjusted R square. 3) Factors' weight effects rent value with Beta coefficient and 4) Higher level of data like ratio and interval scales can be utilized with less variance from leveling down data. 5) Proper equation of serviced apartments appraisal without human error with higher reliability as well as validity.

4. Factors influence Value of Serviced Apartments

Literature review in this part is to examine factors affecting rent value regarding property value (Frew and Jud 2003) particularly serviced apartments in order to get suitable factors in a Bangkok context. Brainstorming among real estate experts is conducted with an aim to strengthen the completion of variables. Developing ideas by selecting proper factors from past research beyond serviced apartments is also taken into account.

In overview, factors affecting property value depend on project amenities, unit amenities and location attributes and linkages. From the research of Hardin III and Cheng 2003, through studying 434 apartment units in Atlanta discovered that project age, unit size (Tse and Love 2000), fitness center, social facilities, playground, covered parking, pet allowance and security guards are factors relating to rent value. In addition of the study, room types (one, two and three bed room) brought different importance levels similar to the study with Decision Making Tree technique of Zhi Fan, Ong and Koh (2006); Pagliari, Jr. and Webb (1995) of apartments in Singapore except locational factors that have no effect at all to rent value. In contrast to the study, Frew and Jud (2003) indicated that distance from apartments to Oregon's CBD, project size, and unit size significantly impact value however project age and environmental quality have less effect. Butler (1982) studied 1,500 single detached house and multi residential projects in Saint Louis by comparing property and rent values in order to explore biases. The research indicates that factors influencing rent and property values are number of units, project age, quality of water supply, distance to CBD and building structure. Population density affects only rent value whilst hot- cold water affects only property value. Guntermann and Norrbin (1987) found different rentees such as students and non students resulted different important level of apartment components and have studied single detached house and apartment rent values and discovered swimming pools and hot tubs are the only factors that differentiate them from apartments. While Benjamin, Chinloy and Sirmans (2000) found that swimming pools and tennis courts are not factors impacting value though Jacuzzis, fireplace s and a no pet allowance are added values for apartments. The results also demonstrate that the number of restrooms has a 24 percent impact on value and high rise buildings have a 9-12 percent higher value than low rise apartments.

The study of Po (2005) about serviced apartments in Hongkong found four sets of attributes as follow; 1) Physical set of attributes including age, area, number of bedrooms and balcony 2) Locational set of attributes including distance to subway and sites 3) Amenities set of attributes including swimming pool, fitness center and sea view in similar to Benson (1998) and 4) Service and occupancy restrictions set of attributes including availability of internet and electric and water supply charges while duration of agreement and number of cleaning times are not significant. Apart from Po (2005) study, Sirmans and Benjamin (1992) and Benjamin and Sirmans (1996) point out that modern designed kitchens and external factors including

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traffic congestion and distance to public transportation are important to rent value.

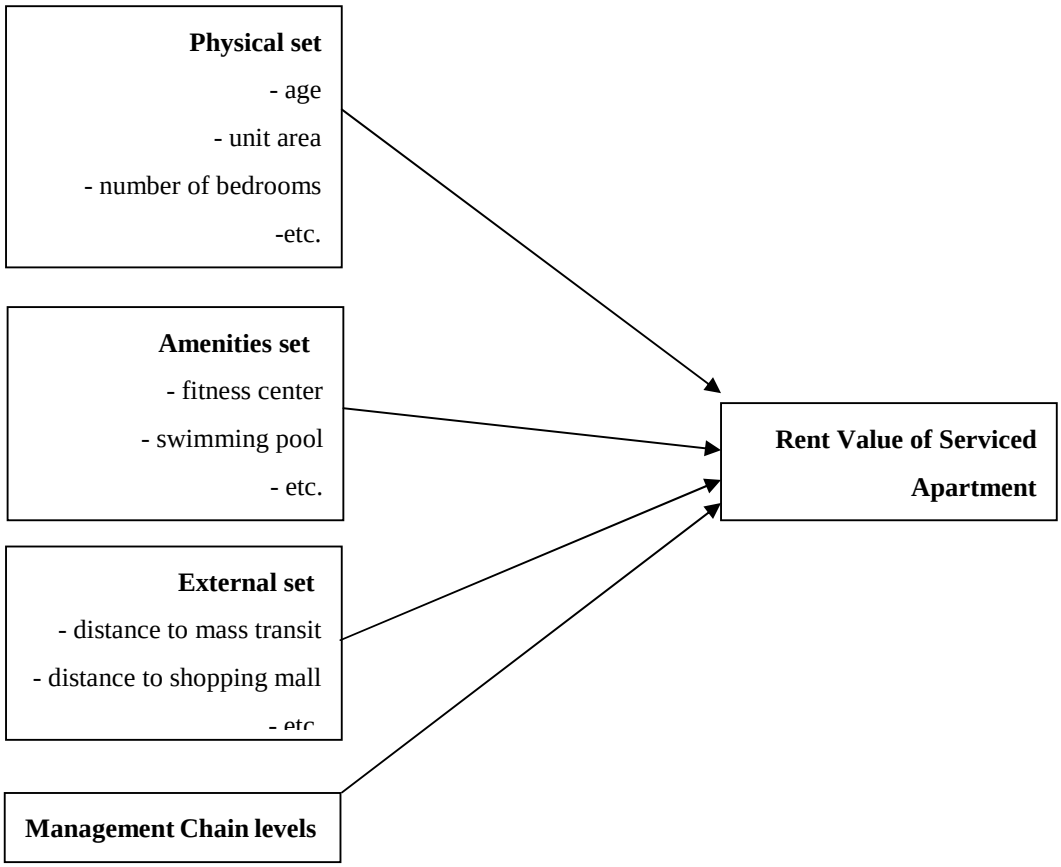

Figure 2 Research Framework

In Thailand, not much research about real estate has been conducted, Kumnuengnetr (2004)'s study of condominiums in Pattaya city reveals 15 influencing factors from highest to lowest impact to value as follow; the first components are fitness center and building age (48.38 percent weight); second component are building, number of elevators, floor, unit area, cleanliness, parking and surroundings (22.12 percent weight); third components are urban regulation, location, distance to main road, building type and balcony (18.64 percent weight) and last components are swimming pool and security guards (10.86 percent weight). It is interesting that Kumnuengnetr' study involves intangible factors like cleanliness and surroundings. Akeakara, Kittiampanont and Pipatsithee (2006) found similar results that unit area, number of bedrooms, bath tub, floor levels, project size, swimming pool and fitness center are significant factors.

From the above reviews,found that most sets of factors are similar while only some details differ which might happen from various cultures, locality and some errors. Factors relating to rent value of serviced apartments are adopted from the reviews and adapted in order to conform to context of Thailand. Therefore, four set of factors are located as shown in the research framework in fugure 2. Having management chain level of organization attributes leads to no significant in services and occupancy restriction attributes. In a nutshell, the factors in this study are a combination of 1) Physical set of attributes 2) Amenities set of attributes 3) External set of attributes and 4) Chain level of organization which some attributes are emerged

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from professional brainstorming.

5. Research Methodology

This research is a survey and cross sectional study of factors influencing serviced apartment value. The research was conducted from the 1st of December 2012 to the 1st of May 2013 with analysis of only serviced apartments in the Central Business District (CBD) of Bangkok. With Serviced Apartment Report Quarter 1 2012 by Colliers International (Colliers International Thailand, 2012), the 4 areas of study are a combination of ; 1) Central CBD (including Silom, Sathorn, Surawong, Si-Phraya, and Rama 4) 2) Central Lumpini (including Lungsuan, Ruamruedi, Ploenchit, Wireless, Asoke) 3) Early Sukhumvit (including Sukhumvit 1- 35) and 4) Late Sukhumvit (including Sukhumvit 36- 77). to the research was divided four areas of study because in real estate different locations can easily lead to different rent values. In other words, the factor of location must be controlled. Furthermore, samples were randomly selected by Chain level of organizations composing of local, National, and International.

5.1 Population and Samples

Sample size was at least 288 units conducted with finite population formula from a total of 18,259 serviced apartments in CBD of Bangkok (Colliers International Thailand, 2012). However, to be sure of the statistical prediction power, this research uses 346 units from at least 200 projects as samples. Non- proportional and Quota sampling were applied through 4 areas of study which were Central CBD, Central Lumpini area, Early Sukhumvit area and Late Sukhumvit area.

5.2 Data Analysis

Describing general information of samples with Mean Standard Deviation (SD) Number and Percentage and analyzing data with Multiple Regression Analysis (MRA) with an aim to receive standardized regression equation for comparing factors' weight and also unstandardized regression equation for creating a predictable formula of service apartment rent value. Dependent variables in the study were market rent of serviced apartments (Baht/ sq.m./month) while independent variables were composed of; Physical set of attributes including age (year), unit area (sq.m.), floor level, total floor of building, number of bedrooms, number of bathrooms, number of toilets, balcony size (sq.m.), quality of furniture, bath room items, kitchen items, laundry items; Amenities set of attributes including fitness center, swimming pool, sauna and shuttle van service; and External set of attributes including distances to mass transit (m.), distances to main road, and distances to supermarket. Secondary data was collected from real estate agent's websites, serviced apartment websites as well as direct information via telephone contact.

Qualitative technique was used for a deep understanding as well as interpreting the result through professional public hearing. Opinion and critism are beneficial for further discussion with quantitative results.

6. Results and Discussion

The results can be divided into two main parts. The first part describes the general data of samples while the second part tests the correlation analysis between the sets of independent and dependant factors through multiple regression analysis.

6.1 General data of samples

From table 3, a total of 346 units were collected in the area of the study and can be categorized as 98 units in Central CBD, 38

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units in Central Lumpini area, 115 units in Early Sukhumvit area and 95 units in Late Sukhumvit area in various buildings and found that some buildings are operated as mix-use between hotel and serviced apartment. Interestingly, growth in serviced apartment number in late sukhumvit area seems rising up. 253 serviced apartments (73.1%), 16 serviced apartments (4.6%) and 77 (22.3%) serviced apartments are managed by local, national and international chains consecutively. It can be concluded that one and two bedroom types are most demanded in the market therefore, one and two bedroom types are the majority (79.8%) of the study.

Table 3 Data Frequency

Area of study	Number	Percent
Central CBD	98	28.3
Central Lumpini	38	10.9
Early Sukhumvit	115	33.2
Late Suhkumvit	95	27.4
Total	346	100
Management level		
Local	253	73.1
National	16	4.6
International	77	22.3
Total	346	100
Number of bedrooms		
Studio	37	10.7
One bedroom	167	48.3
Two bedroom	109	31.5
Three bedroom	26	7.5
More than three bedroom	7	2.0
Total	346	100

From table 4, the average age of the samples is 8.18 years and avarage room area is 90.47 sq.m. while, minimum and maximum areas are 18.0 and 531.0 sq.m. Average distances to closet subway or light rail transportation and to closet supermarket are walking distances around only 600 – 800 metres. It might confirm that most serviced apartments are in superior locations. Minimum and maximum rent per square meter are 216.2 baht/month and
2 458.5 baht/month while average rent is 804.4 baht/month with 357.8 baht/month as the standard deviation. With types of management and rent, serviced apartment grades in Bangkok are rather high in scattering.

Table 4 General data of samples

Factors	Minimum	Maximum	Mean	SD
Age (year)	.00	33.0	8.18	6.22
Room area (sq.m.)	18.00	531.0	90.47	68.20
Number of kitchen items	1.00	7.00	5.73	1.25

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Distance to supermarket	1.00	2 600.00	614.72	525.95
Distance to subway or light rail	10.00	3 090.00	803.20	580.72
Rent value (baht/sq.m./month)	216.22	2 428.57	804.45	357.80

6.2 Rent Value and Factor's Weight of Importance

A total 51 factors from 4 sets of factors were studied as independent factors of the research framework. Prior to test the model, multicollinearity has been tested and resulted no effect between independent variables. Relationships between independent factors and rent value were examined by multiple regression analysis with a stepwise approach and only 15 factors were significant. Regarding adjusted R square of 0.581, the predictability of the model is rather high however still other significant factors were not included in the model. Even though, this research attempts to cover intangible sets by applying management chain levels; it is convincing that the rest of the factors should be set of intangible assets such as quality of service and service experiences which are delicate as well as cloudy.

Interestingly, the most important factors are the physical set (table 5). Physical set is also important in other studies moreover, quality of furniture, number of provided kitchen items are very unique factors for serviced apartments because tenants are more selective than hotel customers. Building age and room area have a diverse relationship to rent value which could explain that the older the serviced apartment is the cheaper the serviced apartment cost. Bigger room area has lower rent value than smaller ones that can be compared to wholesales. Eventhough exclusive parking access has the lowest significance to rent value, it is still important to tenants. Unlike hotels, a serviced apartment target expatriates who stay longer; therefore the amenities set such as restaurant, steam room and game room is more vital for daily life. However, playground, sauna room and jogging track are in a converse relationship which might be regarded of the indirect effect caused by age of buildings therefore further investigation is in need.

Most people strongly believe that mass transit is the most influential factor for real estate development. Yet, the result emphasyzes that distance to mass transit has an impact of -0.15 among factors, the fifth rank in the model. Distance to supermarket is the fourth rank showing its importance to daily life. Having serviced apartment in the Late Sukhumvit area seems gaining higher rent that might be regarded to its novelty of the area conforming to the theory of multiple nuclei urban growth. Another surpise is about management chain levels which believed that there must be some differences among levels of management. Actually, no significant relationship was shown, as a result it can be explained that all levels of management can treat customers indifferently or other factors like location is much more important for customer selection than management levels.

The concept of developing serviced apartments must be unique and differentiated from other kinds of property due to the characteristics of long stays and service providing. Longer stays and service providing are two key points to be concerned about relating to tenants' behavior. It is noticeable from the result that most significant factors are rather unique factors for serviced apartment such as furniture quality andnumber of kitchen items. Amenities set also has a high impact to rent value that is no doubt at all for the requirements of people who live at least one year in the building in contrast to people who stay only one night. It is against Thai developers's beliefs; this study has shown the fifth rank significance between mass transit and rent

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value. From the observations, it might be that expatriates who live in serviced apartments do not depend on mass transit; they use their own private car as well as a driver. Therefore, the importance of factors in hotels, condominiums, apartments or serviced apartments must be delicately explored.

Table 5 Factor's weight of importance

Factors	Unstandardized coefficients	Standardized coefficients	t	Sig.
	B	Beta		
Constant	384.243		4.614	.000
Physical Set				
Building age	-7.631	-.132	-3.196	.002
Room area	-1.489	-.293	-7.129	.000
Furniture quality	89.611	.282	5.684	.000
Number of kitchen items	83.990	.298	7.030	.000
Exclusive parking access	78.193	.085	2.079	.039
External Set				
Distance to supermarket	-.111	-.152	-3.639	.000
Distance to subway or light rail	-.103	-.165	-4.105	.000
Late Sukhumvit area	83.231	.101	1.985	.048
Amenities Set				
Playground	-143.501	-.179	-4.280	.000
Restaurant	91.774	.122	2.902	.004
Sauna room	-93.582	-.130	-3.027	.003
Exclusive floor access	68.241	.082	2.057	.041
Steam room	143.588	.187	4.214	.000
Jogging track	-185.789	-.088	-2.225	.027
Game room	157.723	.089	2.277	.024

Adjusted R Square = 0.581

Weighted Quality Score (WQS) Technique is in widespread useby Thai appraisers even though; there is no clear and reliable process. Therefore this research attempts to explore suitable factors in order to enhance appraisers' reliability. The research results 1) reliable and significant factors combining of 15 factors from 3 sets 2) weights of importance of each factor in the model by standardized coefficients 3) weights of each factor in the model by unstansardized coefficients 4) predictability power of the model. From qualitative study by public hearing by professional participants, recommendation and suggestion demonstrated that the predictability of the model is rather high in terms of statistics nonetheless, in practice the model still needs to investigate more involved factors especially intangible factors such as ambience, reliability and quality of services however, standardized beta coefficients are preferred and agreed to apply in valuation process. Limitations of the study are variances of samples regarding to different terms of rent such as monthly, quarterly or yearly contracts or frequency of services

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for example, once or twice a week or daily cleaning that might impact rent which in this research, analysis has been done base on monthly basis. Further research of other kinds of property such as apartments, land, and office buildings should be conducted. In addition, different countries might yield different results therefore different environments must be of concern. This research is not only beneficial for appraisers but also developers who can also use the results in order to develop serviced apartment projects effeiciently by prioritising the project's importances.

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Public hearing with professional participants

25 Students and Alumnis from Thammasat Business School, Thammasat University

25 expertises from Thai Valuers Association (TVA)

25 expertises from The Valuers Association of Thailand (VAT)

25 expertises from Appraisers Club, The Thai Bankers' Association (TBA)

ISSN 2076-9202

FINANCIAL REPORTING DELAY AND CORPORATE GOVERNANCE: EVIDENCE FROM TUNISIA

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Abstract: *Timeliness is an important qualitative characteristic of accounting and is a fundamental element of the relevance of financial reporting information. For an emerging market economy, timeliness in reporting of otherwise non-publicly available financial statement information remains, timeliness the most part, the only means by which outside shareholders and investors keep themselves informed about the firm performance.*

This study empirically investigates the relationship between the timeliness of the financial reporting and the corporate governance proxies for companies listed on the Tunisian stock exchange during 2009. It investigates the role of the corporate governance mechanisms on the timeliness of corporate financial reporting besides; it investigates the relationship between the company size, leverage, profitability (good news), and the timeliness of corporate financial reporting.

Using a multivariate analysis, we find evidence that ownership concentration, the CEO's duality function , and good news have some impact on the interim period between the auditors' signature dates and the publication dates, hence, on the timeliness of the release of financial statement information to the public.

Keywords: *company ownership, CEO, financial reporting timeliness, Tunisian listed companies.*

INTRODUCTION

An efficient and effective capital market needs a transparent financial reporting system to boost investors' "confidence in making investment decisions". Financial information should be of higher quality before being delivered to the outside stakeholders because the users of financial information demand for complete, transparent and timely information. Singhvi and Desai (1971) suggest that the quality of reporting requires, a complete, accurate, reliable reporting prepared in a timely manner that leads to quality the decision making. Thus, timely financial reporting is considered as one of financial reporting quality as that lead to the decision making quality.

Timeliness of financial reporting has made information available for the decision-makers before it loses

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its capacity to influence the decisions. Greater benefit will be derived from the timely reporting of the financial statements, which specifically refers to the shorter time between the end of the financial accounting year and the date of the independent auditor to issue an audited annual report. The delay in releasing the financial statements is most likely to boost uncertainty associated with the decisions made based on the information contained in the financial statements (Ashton, Willingham and Elliott, 1987). Therefore, timely reporting will enhance the decision making process and reduce the information asymmetry in the capital market (Owusu-Ansah and Leventis, 2006). The issue of timely reporting also affects the regulators and policy makers since they need to play a role in ensuring shorter financial reporting delays. Hence, exploring the determinants of timely reporting would enhance the regulators of emerging capital markets in formulating new policies to improve the allocation efficiency of their markets.

Hence, the objective of this study is to investigate the impact of corporate governance mechanisms on the financial reporting delay. This study includes the ownership structure and the board of directors' attributes, since an effective monitoring by the board strengthens the internal control and reduces the financial reporting business risk hence, it can shorten the annual reporting delay.

I. Development of hypotheses and variables:

Various studies on the timeliness of corporate reporting and/or the audit delay have been undertaken in a number of countries. Most of these studies which were conducted in the US, are mainly related to issues such of the timeliness of the annual earnings announcements (Givoly and Palmon, 1982, Elliot, 1982 a,b; Chambers and Penman, 1984; Bamber and Schoderbek, 1983, Han and Wild, 1997), or the timeliness of corporate and audit reports (Zeghal, 1984; Krishman, 2005). Several studies have also been carried out in Australia (Davis and Whittred, 1980), Canada (Newton and Ashton, 1989), Bahrain (Abdulla, 1996), France (Soltani, 2002), Greece (Owsu-Ansah and Leventis, 2006). The objective of this section is not to provide an extensive review of these studies, but rather to develop the hypotheses to be tested by the present study, relating to corporate governance mechanisms (ownership structure, board composition), leverage, good news (profitability) and size of the firm.

1. Ownership structure:

1.1 Ownership concentration:

Indeed, the interest in a rapid dissemination of financial information goes along with the importance of this information in the relations between the firm and its partners. The political theory of contract sets forth only the dissemination of quality of the financial information (audited) as an objective of minimizing the agency costs and the costs incurred by the political visibility of the firm (Watts and Zimmerman, 1986). Therefore, according to this theory, firms that do not support square necks agency-especially with their donors, who are at low risk, generally to social and political pressure, have no interest in investing resources to shorten their time to publish the results. The agency relationship is assessed by reference to the conflicts between the shareholders interest. Regarding the maximum of the

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value of the equity market, firms which have a highly dispersed capital suffer greater pressure to rapidly disseminate their financial results than those which have a capital concentrated in the hands of the leaders or of few large shareholders. The informational value of accounting is indeed very limited for those who can be classified as insiders, and because of their function or their participation in the monitoring bodies was have access to privileged information, Ashton et al. (1987).

In other words, the dispersion of share ownership should encourage firms to distribute their financial results more quickly and therefore urge their auditors for ** they issue their opinion earlier. Conversely, there should exist a positive relationship between ownership concentration and the time of the publication of the annual reports. Thus, we suppose the following hypothesis.

H 1: A positive relationship between ownership concentration and financial reporting delay.

1.2 Institutional ownership:

These investors share their experience and the leaders can uphold and apply the principles of "corporate governance" to protect the shareholders rights. They want a more transparent communication, by showing firms risks and the key success factors to better evaluate and estimate the distribution of the future cash flows. Sharing blocks, the institutional investors can force the managers to improve the quality of their publication. Mitra and Cready (2005) provide evidence that active monitoring from the institutional investors also helps prevent the managerial opportunistic reporting behavior and improve the quality of governance in the financial reporting process. They find that institutional shareholders intervene and mitigate the self-serving behavior of corporate managers in financial reporting based on a sample of 136 companies belonging to the S&P 500 group and 237 to the non-S&P 500 category over a period of eight years (1991-1998).

However, the results of the empirical tests on the influence of ownership held by institutional investors on the practice of voluntary disclosure are contradictory. Indeed, Bushee and Noe (2000) show that levels of institutional ownership are significantly and positively associated with quality of disclosure. The rationale behind this hypothesis is that a greater disclosure attracts investors and a more monitoring of professional investors encourages managers to provide more information. On a sample of 1262 firms, Elgazzar (1998) shows that the presence of institutional investors is positively associated with the premature publication of results. Healy et al. (1999) and Bushee and Noe (2000) consider institutional investors as agents of the most demanding in terms of regular financial information and publications in due course.

Thus, we suppose the following hypothesis.

H2: there is a negative relationship between the presence of institutional investors and the financial reporting delay.

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2. Board composition:

2.1 The proportion of outside directors.

Fama and Jensen (1983) explained that the outside directors could strengthen the firm value by lending experienced and monitoring services which are supposed to be guardians of the shareholders' interests via monitoring and control. O"Sullivan, 2000; Salleh *et al*., 2006) found that the proportion of the board independence had a significant and a positive impact on the audit quality. The larger the proportion of the independent directors on the board, the more effective it will be in monitoring the management behavior and thus, reduce the nature of inherent risk which at the end reduce the financial reporting lag . Cohen *et al*. (2002) argued that when a client' s governance structure has effectively implemented a strong monitoring as well as a strong strategic perspective, there is the potential for a more efficient audit work which leads to a low extent of tests of details and a greater assurance of the integrity of the financial statements. This could then affect the assessed level of inherent and control risks, thereby affecting the nature, the timing and the extent of the financial reporting delay. Thus, we suppose the following hypothesis.

H3: There is a relationship between the proportion of the outside directors and the financial reporting delay.

2.2 The duality of the CEO:

Ho and Wong (2001) suggest that a unit structure of leadership adversely affects the quality of information as the person who acts as the CEO will tend to conceal unfavorable information. Forker (1992) shows that the person holding the position of chairman and CEO represents a threat for the quality of the disclosed information. Indeed, the CEO and Chairman have different roles. The combination of these two roles is a high concentration of power that may jeopardize the independence of the board which will have a negative impact on the shareholders' wealth. Jensen (1993) recommends separating the functions of the Chairman from that of the Chief Executive officer, to reduce the discretion of the manager and ensure the effectiveness of the Board of Directors. Forker (1992) shows that the separation role of the president and the CEO helps enhances the quality monitoring officer and lower margins of withholding information, which will consequently improve the quality of disclosure . Cooke and Haniff (2002) reject the case, the assumption that the appointment of a non-executive director to the post of Chairman of the Board would result in a greater disclosure of information.

The relationship between the two variables is negative and significant at 1%.

Acray and Vazquez (2002) do not find a significant difference in the index of disclosure by companies that show whether this duality is verified. Thus, we suppose the following hypothesis.

H4: There is a relationship between the function duality of the CEO and the financial reporting delay.

2.3 The size of the Board:

The size of the board of directors has also been the subject of various criticisms. Various questions were asked. How many members should serve on the board? Should we limit the number of directors? Is there a lack of consistency in the councils composed of too many administrators? The relationship between the size of the board and the voluntary decision to publish was first studied by Ho and Wong (2001). The authors

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find, however, a non significant relationship between the size of the board and the voluntary publication. We conclude that insofar as the size is small, the control is more effective, and officers act in the interests of shareholders. The favorable effect on the control of the leaders leads to a positive influence on the information policy of the company. Thus, we aset the following hypothesis.

H5: there is a relationship between the size of the board and the financial reporting delay.

Alternative hypotheses:

3.1 Leverage:

There are two competing theories that might explain the association between the firm's capital structure and timeliness. Each theory suggests a different direction of the relationship. One view is based on the agency theory. It has been proposed that a capital structure is associated with the agency costs (Jensen & Meckling, 1976; Smith & Warner, 1979). Agency costs are expected to increase with leverage, which transfers wealth from debt-holders to managers and shareholders because high-leveraged firms have the incentives to invest in riskier projects than originally planned ones. Thus, highly geared companies might demand a high quality of financial reporting service to satisfy the needs of long-term creditors and also to remove the suspicions of debt-holders about wealth transfer (Chow, 1982; Ashbaugh & Warfield, 2003).

Hence the expectation is that the higher the gearing, is the higher the quality of the assurance service will be. (Carey, Simmett, & Tanewski, 2001). Moreover, the higher the gearing is, the riskier a company becomes, which increases the possibility of failure, and this has various adverse consequences on external auditors. Therefore, the auditors might be less prone to compromise the quality of their audit as the gearing increases. Moreover, the Tunisian banks continue to be a major provider of capital, which gives them the ability to monitor the companies' affairs themselves. This, in turn, would imply a lower demand for the audit as a monitoring mechanism. Abdulla (1996) and Conover et al. (2007), found a negative relationship between the leverage and the reporting lag in four countries out of the twenty-two studied. The other view assumes that highly geared companies are expected to delay the announcement of their corporate reports. Carslaw and Kaplan (1991) and Owusu-Ansah (2000) believe that a high debt-to-asset ratio increases the probability of default and ultimately bank-ruptcy, especially during an economic downturn. Several empirical studies reported a positive relationship between the leverage and timeliness. Among these are those of Carslaw and Kaplan (1991), Owusu-Ansah (2000), Boonlert-U-Thai, Patz, and Saudagaran (2002), and Conover et al.(2007), in New Zealnd, Zimbabwe, Thailand, and in eight countries of the studied 22 countries, respectively. The following hypothesis in the alternative form is developed:

H6: the financial reporting delay is a function of company leverage.

3.2 Firm's size:

It is reasonable to expect that the larger the company is, the higher the demand for a high quality of financial reporting will be. The size has been associated with higher agency costs (eg., Chow, 1982), which are mitigated by high audit quality. As a company grows larger, the delegation of duties becomes

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necessary and reduced observability gives rise to moral risk and opportunistic behavior. Abdel-khalik (1993) hypothesizes that a high quality audit is associated with the company's size, as a compensating control system for the organizational loss of control in hierarchical organizations. Moreover, he argues that the size of a company is also relevant because it indicates the maximum amount of wealth at risk. Large companies are more dependent on external finance and therefore they may be more sensitive to the needs of existing and potential investors who might demand adequate audit procedures. Besides, large companies have a greater following analysis, which might influence a number of audit decisions. Additionally, large companies are more visible than smaller ones and, in turn, are more likely to adopt strategies to reduce potential regulatory intervention. Finally, large firms possess greater resources to pay the higher audit fees charged by the big four and to get the audit done within a shorter period. However, it could also be argued that the larger the auditee, the easier it is for the auditor to achieve economies of scale when conducting an audit (Firth, 1985), and that any savings may be passed to the client. Previous empirical studies have found an inverse relationship between timeliness and the size of the company (e.g.; Dyer & McHugh, 1975; Davis & Whittred, 1980; Givoly & Palmon, 1982; Owusu-Ansah, 2000). In contrast, Courtis (1976), Ashton et al.(1987), Bamber et al.(1993), Simnett et al.(1995), Abdulla(1996), Leventis and Weetman(2004), and Owusu-Ansah and Leventis(2006) find an insignificant association between timeliness and the auditee's size. These results suggest that superior financial resources are not sufficient to process information faster as the amount of information that they have to gather is vast and may come from numerous divisions, branches, and subsidiaries. Consequently, and based on the theorization posted earlier and the results of the majority of the empirical studies, the following hypothesis is developed in the alternative:

H7: the financial reporting delay is positively associated with the company's size.

3.3 Good news:

Prior research has found that firms that experience losses for the period would result in longer financial reporting lag (Givoly and Palmon, 1982; Ashton *et al*., 1989; Ismail and Chandler, 2004). Prior studies also reported that firms experiencing losses for the periods are expected to have a longer reporting delay compared to the ones reporting a profit. There are some underlying reasons to the expectation of the firm's performance with financial reporting lag. Firms that have bad news, which is losses, tend to delay their financial statement release because they are avoiding reporting the bad news to their shareholders and investors and might jeopardize their firm reputation and performance. However, besides in firm, that experiences a profit, the management wants the auditor's to complete its annual report in a short time because they want to report the good news to their shareholders. Moreover, the auditors may take longer time to audit firms that incur losses because of the associated auditor business risk (Afify, 2009). Hence, the expected relationship between the firm's performance and the audit reporting lag is as follows:

H8: There is a negative relationship between financial reporting delay and firm performance.

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II. Research design

1. Sample:

This study used secondary data as the main source of information. The information relating to the proportion of the board independence and to ownership structure attributes are collected from the company's annual reports. Only listed companies are selected to be included in the sample(33 companies). The sample selection process does not consider the finance-related companies. Finance-related companies are excluded from the sample because they have significantly different requirements, rules and regulations with respect to financial reporting. The sample selection covers only audited annual reports for the year 2009 which is considered as the current sample size in this study. All corporate annual reports were downloaded from the Tunisian Stock Exchange website and collected by hand.

2. Measuring timeliness

Here, timeliness is measured in terms of the lapse of time between a company's year –end and the date when the financial information is released to the public, which in turn is related to the quality of the information reported. This period is divided into two sub-periods. In determining the timeliness of the annual reports, first, this study determines whether a company complies with the listing requirement by announcing its annual report within the three-month allowable period. Second, the actual number of days a company takes to announce the annual report is taken into account. It is judged that the greater the number of days a company takes to make the announcement, the lower the quality of reports will be, and vice versa. Currently, the date of the financial year end and the announcement date for each company's annual report are available from the annual reports posted on the website of the Tunisian Stock Exchange. In line with the previous researches, two measures of the reporting' lag are used as dependent variables in the present study.

The interim period (INTERIM) is defined as the number of days from the opinion signature date on the auditors' reports and the publication date, that is, the date on which the annual reports appeared in the newspapers, or the date the reports are published on website of the TSE, which come first.

The total period (TPERIOD) is defined as the number of days between the financial year-end and the earlier of the newspaper publication date or the date of posting the reports on the website of the TSE.

3. Operationalisation of variables:

The study used multiple regression analysis by modeling a delay and Interimperiod as a function of explanatory variables. Corporate governance characteristics are modeled as independent variable and other control variables consistent with prior studies. Specifically, the model used in this study is consistent from prior studies (Aljasmi, 2008; Che-Ahmad and Abidin, 2008; Afify, 2009; Mohd Naimi *et al*., 2010).

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Determinants of the interim period and the total period are the interest to the present study. The following models are used to test the hypotheses:

$TPERIOD = \beta_0 + \beta_1$ concent$+ \beta_2$insinvest $+\beta_3$lev$+\beta_4$gnews$+\beta_5$ lsize$+ \varepsilon$ (1)
$TPERIOD = \beta_0 + \beta_1$outdir$+\beta_2CEO+\beta_3$bsize$+\beta_4lev+\beta_5$gnews$+\beta_6$ lsize $+ \varepsilon$ (2)
$INTERIM = \beta_0 + \beta_1$ concent$+ \beta_2$insinvest $+\beta_3$lev$+\beta_4$gnews$+\beta_5$ lsize $+ \varepsilon$ (3)
$INTERIM = \beta_0 + \beta_1$outdir$+\beta_2CEO+\beta_3$bsize$+\beta_4lev+\beta_5$gnews$+\beta_6$ lsize$+ \varepsilon$ (4)

Table 1 presents the dependent and independents variables, definitions of these variables and the expected signs.

Table 1. Summary of operationalisation of variables

Variable names	Operational Measures
Total period (Ldelay)	number of days between the financial year-end and the publication date (logarithmic)
Interim period (interim)	Number of days from the opinion signature date on the auditors' reports and the publication date
CONCENT(-)	proportions of shares held by the majority shareholder of the company
INSINVS(-)	Proportions of equity held by institutional investors
OUTDIR(?)	Number of outside directors on the board
CEO(+)	binary variable coded 1 if there is duality function of the CEO, 0 otherwise
BSIZE(?)	Number of directors on the board.
LSIZE(-)	Log of firm's total assets
Good news(-)	Net income to equity
LEV(?)	Total liabilities to total assets

III. Analysis of Results and Discussions:

1. Descriptive Analysis:

Table 2 reports the descriptive statistics of all the variables investigated in this study. The table shows the descriptive of a minimum, maximum, mean and standard deviation. Using data from 33 observations of

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annual reports from the TSE for a year period of 2007, it was found that the average financial reporting lag was 150 days with a standard deviation of 24.51 days. The analysis of the sample study also shows that majority of the companies (27) were found to have financial reporting lag of more than 120 days and violated the Tunisian Stock Exchange requirements on the minimum submission period of four months. However, only six companies in the sample complied with the financial reporting requirements on financial reports as required.

Table 2. Descriptive Statistics (excluding dummy variables)

variable	Min	Max	Mean	Std dev
Delay	100	194	150	24.51
Interim	1	111	41.81	27.69
Concent	18.4	88.81	46.23	18.85
Insinves	7.07	89.27	56.34	25.54
Outdir	0	11	1.57	2.55
Bsize	5	12	8.24	1.93
Leverage	0	54.58	12.90	14.52
Tactif	1.68 e+07	1.48 e+09	1.07 e +08	2.51 e+08
Roe	(-51.46)	136 .60	21.23	34.26

Variable definitions are provided in Table 1

1. Correlation Analysis:

The objective of the test is to see if there are any multicollinearity problems among the variables and association among variables. The problem exists if independent variables are highly correlated at each other with correlation values exceeding 0.9 according to Tabachnick and Fidell (2007). However, none of the variables found to be more than 0.5. The highest correlation is between the two control variables which are the audit opinion and the firm's performance (profitability) that is 0.284 which suggests that multicollinearity is not a serious problem that would jeopardize the regression results, Tabachnick and Fidell (2007).

The correlation coefficients between the dependant and independent variables are shown in table 3.

The figures show that the correlation coefficients between (ldelay) and between (concent) might indicate a possible multicolineraity between each set of the variables, because the coefficients exceed 0.5. To ensure that the regression models used do not suffer from a serious multicollinearity problem, for each model tolerance and variance inflation factor (VIF) are calculated. According to Menard(1995), tolerance statistics below 0.2 indicate a potential multicoliniearity problem. Bowerman and O'connell(1990) and Myers (1990) state that vif values in excess of 10 gives reason for concern. Studemmund(2001) states that vif values in excess of five suggest a multicolinearity problem. The actual minimum tolerance of independent variables included in the models is 0.512 (VIF=1.95).

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Table 3: Correlation coefficients of dependent and independent variables excluding dummy variables

variables	ldelay	Interimperiod	concent	insinves	outdir	bsize	leverage	ltactif	roe
Ldelay	1								
Interimperiod	0.607	1							
Concent	0.627	0.516	1						
Insinves	0.602	0.243	0.519	1					
Outdir	-0.040	0.245	0.022	-0.152	1				
Bsize	0.077	0.099	0.056	0.232	0.135	1			
Levergae	0.109	0.023	0.295	0.044	0.443	0.153	1		
Ltactif	-0.131	-0.143	-0.158	0.143	0.088	0.152	-0.046	1	
roe	-0.574	-0.253	-0.334	0.443	0.164	-0.114	-0.220	0.228	1

Variable definitions are provided in Table 1

2. Multivariate Analysis:

Table 5 and 6 show the regression analysis for 33 companies.

The results support the proposition that corporate governance factors have an important influence on the financial reporting timeliness. Results show that concent, CEO and good news are significantly associated with the total period and the interim period.

To further examine the timeliness of the annual reports, 2 regression models were adopted to examine the determinants of the total period, the period between the submission of the annual reports and the financial year end. The results are shown in table (5,6).

Adjusted R-squared values of the models range between 59% and 59.01% . The models indicate that the coefficients of ownership concentration (concent) and duality of CEO are positive and significant at 1%. This indicates that ownership concentration and duality of CEO, probably underwent financial reporting delay than other firms.

The determinants of the interim period are shown in table (5,6).

Adjusted R-squared of the models range from 30.68% to 32.08%. Ownership concentration and the duality function of the CEO and good news are significant at less than a significant level of 5%. The length of the period, depend largely on the board decisions, to release the annual reports. The regression results reveal that both governance proxies (concent, CEO), are significant, but the coefficient of the institutional ownership is not.

The coefficients of the variables representing the board size, the out directors and the firm's size are insignificant. The insignificance of these coefficients should be seen as evidence against the effect of the variables on the timeliness of the annual reports, because some of these effects have already played a role in determining the audit lag period.

The results of these two regress models show that the coefficient of good news (profitability) is negative

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and significant. The positive sign of the coefficient of good news indicates that companies with good news are eager to release their firm results early (Haw, 2000), whereas those with bad news tend to delay the reporting of their results to the public, Kross (1982). These results lend further support to the stakeholders' theory and to the internal reporting hypothesis theorized by Watts and Zimmerman (1990) and Lurie and Pastena (1975), respectively to the results of a large number of empirical studies, including Abdulla (1996) and Wang and Song (2006). Additionally, good and bad news are factors that determine both the interim lag period and the publication period.

As a result, this information probably adds value to the investors, who can incorporate it in their investment decision process. Early publication will signal positive news about the companies' performance, and vice versa. It was found that the interim period is determined largely by the firm's corporate governance, measured by the ownership concentration, duality function of the CEO. The results show that the more ownership is dispersed, the shorter the interim period will be. Furthermore, when the chairman is not the president of the board of directors, the interim period gets shorter.

Leverage is found to play an insignificant role in determining the two reporting lags.

Table 4: Iteration 1 (ownership structure variables)

	Model 1			Model 3		
Variables	Coefficients β	t-value	p	Coefficients β	t-value	p
concent	0.003	2.74**	0.011	0.83	2.79***	0.009
Insinves	0.001	1.40	0.172	-0.10	-0.47	0.641
Leverage	(-0.001)	(-0.79)	0.436	-0.32	-0.97	0.342
ltactif	1.34 e-11	0.15	0.879	-5.46 e-09	-0.29	0.771
roe	(-0.001)	(-2.51)**	0.018	-0.11	-0.76	0.452
	R^2=0.59 F= 9.91 P= 0.000 N= 33			R^2=0.3068 F= 2.38 P= 0.0643 N= 33		

Table 5: Iteration 2 (board composition variables)

	Model 2			Model 4		
Variables	Coefficients β	t-value	p	Coefficients β	t-value	p
CEO	0.18	4.04***	0.000	19.85	4.04***	0.000

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Outdir	-0.004	-0.45	0.657	3.03	-0.45	0.657
bsize	-0.001	-0.16	0.872	0.20	-0.16	0.872
Leverage	0.0011	0.06	0.949	-0.35	0.06	0.949
ltactif	-3.74e -11	-0.43	0.670	-1.76 e -08	-1.84*	0.078
roe	-0.002	-3.99***	0.000	-0.261	-1.84*	0.078
	R^2=0.59		F= 7.54	R^2=0.3208		F= 2.04
	P= 0.0002		N= 33	P= 0.0951		N= 33

** Significant at 10%; ** significant at 5%; *** significant at 1%*

Variable definitions are provided in Table 1

Conclusion

One measure of financial reporting quality is the timeliness of the annual financial reporting. Thus, this study provides recent empirical evidence relating to the financial reporting lag of 33 companies listed on Tunisian Stock Exchange in 2009, using cross section data. In identifying the factors affecting the financial reporting lag, the findings show that the mean of delay is 150 days (which is still above the maximum period of four months as stipulated by the Tunisian Stock Exchange). As hypothesized and consistent with prior studies carried out in the developed country context, we find a strong evidence, by using emerging country data, that the institutional ownership is found to play an insignificant role in determining the two reporting lags. Furthermore, it is found that firms highly ownership concentration's tend to delay the publication of their annual reports as well as have a longer interim period. It was also found that the duality function of the CEO has a positive and significant role in delaying the financial reporting period.

Taken together, these results clearly illustrate, the role played by the ownership concentration and the duality of the CEO in determining the financial reporting delay. These companies should establish an appropriate corporate governance system to limit the opportunistic behavior of managers and ensure the decision to publish the annual financial reports within the statutory deadlines.

Nevertheless, the study is not without some limitations. Since the study is based on cross-sectional study with small sample size, the trend of the financial lags and long term effects of board composition and ownership structure on timeliness of the financial reporting lag could not be examined. Furthermore, the exclusion of companies from the financial sector, due to the different regulations of financial institutions, may also be a pushed factor from generalization.

However, the study may be extended and modified in a number of ways. Firstly, in order to enhance the explanatory power of the financial reporting lags, future studies may consider other mechanisms such as

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the board meetings, the compensation committee and the proportion of the board ownership to examine the whole influence on financial reporting timeliness. Future studies may include more variables to give a broader view of other mechanisms on financial reporting timeliness.

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ISSN 2076-9202

Assessment of the link between Organizational culture and job satisfaction *(Study of an Indian Public Sector)*

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ABSTRACT

In the contemporary business environment, characterized by rapid changes, performance improvement becomes a significant challenge for each enterprise, which can not be addressed by a single activity, but rather by a series of continuous activities at all organizational levels.

This study investigates the impact of organizational culture on employees' job satisfaction. Despite extensive research on organizational culture, very little empirical research examines this scope of investigative study, thus the proposed model was developed and 96 employees surveyed, to test the hypothesis. Questionnaires developed by The Business Research Lab and employeesurveys.com for ascertaining the level of overall job satisfaction. Data were analyzed by employing correlation, simple and multiple regression analyses. Results revealed that employees' perceptions of organizational culture dimensions significantly relate to employees' job satisfaction, with those perceiving a greater degree of awareness of organizational culture dimensions exhibiting the more positive reactions towards job satisfaction.

ISSN 2076-9202

The purpose of this investigation is four-fold. Firstly, to identify a set of organizational culture dimensions that would prove to be an effective guide in the measurement of employees' job satisfaction.

Key Words: *Organizational Culture, Leadership, Management Style , ,Job satisfaction ,Management*

1. Introduction:

In today's business environment, organizational culture is used as a powerful tool that portrays many facets of a workplace as well as to quantify the way a business functions . Research has confirmed that organizational culture is not only able to change, guide and display but also give significant contributions by influencing the thought, feeling, interacting and performance in the organization . The importance of culture is enhanced through its impact on employee morale and work attitudes such as job satisfaction

Today, organizations need more from HR than someone to administer the tactical aspects of an employee survey and to check that managers are holding feedback discussions and have action plans.

Organizational culture and job satisfaction have received significant attention in studies of the work place. This is due to the general recognition that these variables can be the major determinants of organizational performance and effectiveness. Some studies have reported strong correlations of organizational commitment and job satisfaction with turnover. When employees are dissatisfied at work, they are less committed and will look for other opportunities to quit. If opportunities are unavailable, they may emotionally or mentally “withdraw” from the organization. Thus, organizational commitment and job satisfaction are important attitudes in assessing employees’ intention to quit and the overall contribution of the employee to the organization *[17]*

2. Literature Reviews

2.1 Organizational Culture:

The concept of ‘organizational culture’ has become popular since the early 1980s. Along with the growing interest in the topic, there seems to be little agreement within the literature as to what ‘organizational culture’ actually is and, therefore, there are different definitions and perspectives on this topic.

Culture encompasses the values, beliefs, attitudes and behavior of an organization. Culture is how things get done in organizations. It is also a well known fact that an organization’s culture shapes its

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learning orientation. It is therefore important to understand the cultural aspects of the organization before planning any initiative in e-learning or knowledge management."The culture of an organization is an amalgamation of the values and beliefs of the people in an organization. It can be felt in the implicit rules and expectations of behavior in an organization where, even though the rules are not formally written down employees know what is expected of them. It is usually set by management whose decisions on policy usually set up the culture of the organization. The organizational culture usually has values and beliefs that support the organizational goals.

Organizational or corporate culture is the pattern of values, norms, beliefs, attitudes and assumptions that may not have been articulated but shape the ways in which people behave and things get done. Values refer to what is believed to be important about how people and the organizations behave. Norms are the unwritten rules of behavior. The definition emphasizes that organizational culture is concerned with abstractions such as values and norms which pervade the whole or part of an organization. They may not be defined, discussed or even noticed. Put another way, culture can be regarded as a 'code word for the subjective side of organizational life' Nevertheless; culture can have a significant influence on people's Behavior *[13]*

An empirical study by Lund (2003) examined "the impact of the types of organizational culture on job satisfaction in a survey of marketing professionals in a cross-section of firms in the USA". Out of the 1,800 respondent questionnaires mailed, 360 usable questionnaires were received, representing a 21% response rate. The results indicated that job satisfaction levels varied across organizational cultural typology. *[11]*

Chow et al., (2001) conducted an empirical study to explore the association between organizational culture and job satisfaction in a Chinese cultural context. Hypothesis testing was conducted on 762 completed questionnaires. The questionnaire was completed by employees from a wide range of divisions and functional areas and across all staff levels. The results provided quite compelling support for the importance of organizational culture in affecting outcomes. *[2]*

Pool (2000) *[18]* "examined the relationship between organizational culture and job stressor. He found that executives working in a constructive culture reduced the role stressors in their working environment" (Rashid et al., 2003. The results indicate that "a constructive culture will significantly reduce role stressors, thereby, decreasing job tension and increasing job satisfaction, job performance and job commitment" *[21]*

Gifford, Zammuto and Goodman (2002) *[5]* investigated the relationship between hospital unit culture and nurses' quality of work life within seven different hospitals, located in five Western United States cities. Data analysis showed that unit organizational culture did affect the nurses' quality of work life and

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that human relation cultural values were positively related to organizational commitment, job involvement, empowerment and job satisfaction.

Another empirical study conducted by Gray, Densten and Sarros (2003*) [6]* to examine executive perceptions of organizational culture and job satisfaction in small organizations (i.e. less than 100 employees), data were collected using a mailed survey resulting in a final total sample of 1,918 useable responses (i.e. 39% response rate). The results indicated that where emphasis on rewards and supportiveness were perceived as dominant cultural characteristics, there was a strong association with job satisfaction. The results were consistent with findings of previous research by Nystrom (1993) *[15]* in which he found that employees in strong cultures tended to express greater organizational commitment as well as higher job satisfaction within health care organizations

Crawford et al. (1999) used a causal modeling approach to examine the determinants of organizational commitment and labour turnover. Their main conclusion was that a variety of variables (age, pre-employment expectations, perceived job characteristics, and the consideration dimension of leadership style) all influence commitment indirectly via their effects on job satisfaction. In other words, job satisfaction mediated the effects these variables had on commitment. *[4]*

A weaker conclusion was drawn by Price and Mueller (1981 who concluded that the influence of some, but not all, antecedents of commitment was mediated by job satisfaction. Other antecedents (for example, professionalism and kinship responsibility) had a direct effect on commitment. *[20]*

2.2 Different aspects of organizational culture

Similarly, Schein (1989) referred to various 'cultural elements' such as the physical layout of an organization's offices, rules of interactions that are taught to newcomers, basic values that come to be seen as the organization's ideology or philosophy, and the underlying conceptual categories and assumptions that enable people to communicate and to interpret everyday occurrences. He distinguished among these elements by treating basic assumptions as the essence – what culture really is – and by treating values and behaviours as observed manifestations of the cultural essence. In a sense, he classified these elements into three levels of culture (see Figure 1)

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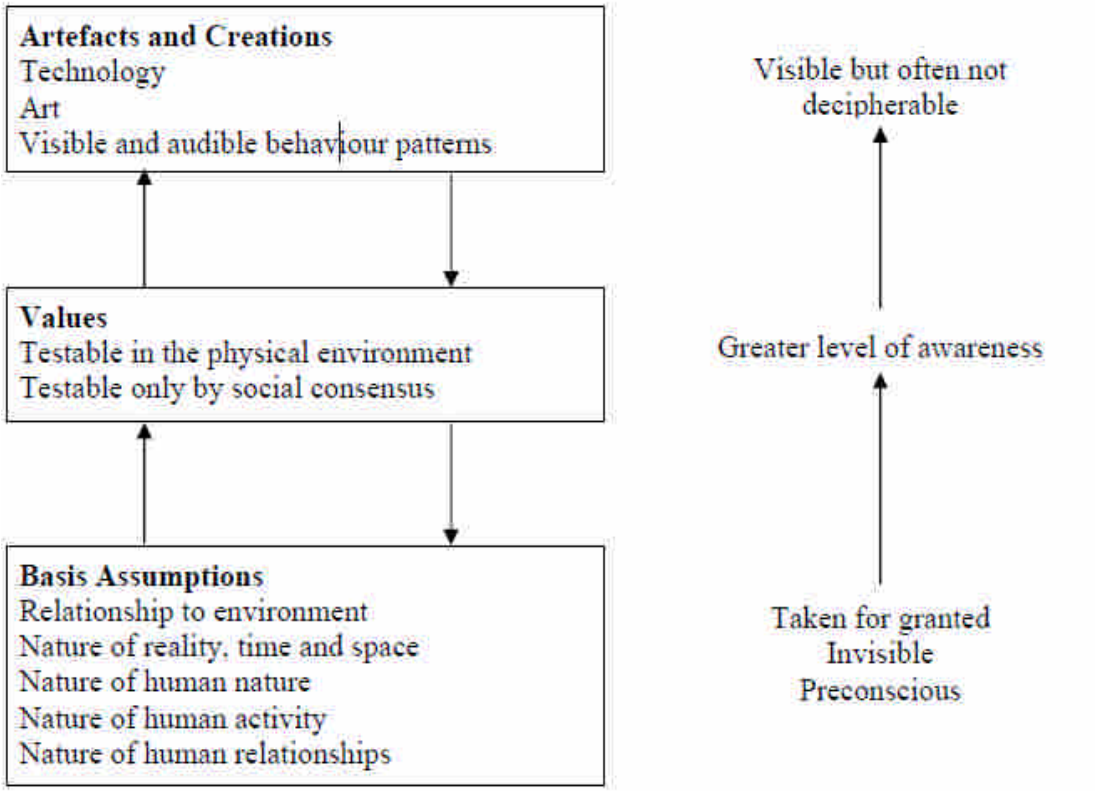
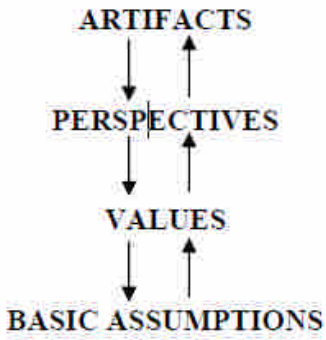
Fig. 1 : Levels of culture and their interaction



Source: Schein, EH 1989, *Organisational culture and leadership*, Jossey-Bass, San Francisco, p. 14.

Earlier, Lundberg (1985, p. 171-172) had offered a very similar view and distinguished four (4) separate levels of meaning for an organization's culture (adapted from Schein (1981*) [22]* and Dyer (1982) (See Figure .2)

Fig. 2 : Organizational culture – levels of meaning



Source: Adapted from Lundberg, CC 1985, 'On the feasibility of cultural intervention in organizations', *Organizational Culture*, Sage Publications, Beverley Hills, CA, pp. 171-172.*[12]*

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At the more visible or superficial levels of culture in Schein's and Dyer's formulation are ***artefacts***. These are tangible aspects shared by members of an organizational group, including variable verbal, behavioural and physical attributes. Also included are such things as the language, stories and myths, rituals, symbols and ceremonies, technology and art used by an organization. The next level involves ***perspectives***: the rules and norms the members of a group or organization develop and share socially in any given context. Perspectives may be viewed as the solutions to a common set of problems encountered by organizational members from time to time. They define and interpret situations of organizational life and prescribe the bounds of acceptable behaviour in such situations. They are relatively concrete and members are usually aware of them The ***values*** are the evaluation base that members of an organization use for judging the 'rightness' or 'wrongness' of situations, acts, objects and people. Values reflect the real objectives, standards and goals in an organization and define as well its transgressions, sins, and wrongdoings. At the deepest level of an organizational culture are the ***basic assumptions***, which are the tacit beliefs that members hold about themselves and the world, their relationships to one another and the nature of the organization in which they work. Largely unconscious, they underpin the first three levels above. They can be viewed as the implicit and abstract axioms that determine the values, perspectives and artefacts of an organization's culture.

Individuals with high desire for influence in the organization and satisfied with work situations showed clear authoritarian tendency in their personality, while persons with high need for social achievement and less satisfied with work situation tended to show democratic tendency in their personality. It seemed that the organization provided greater satisfaction to persons with high authoritarian tendency and high desire for influence. The democratic oriented persons with motivation for social achievement were not satisfied. Individuals with varying degrees of authoritarian personality tendency with varying need patterns interacting with an organizational climate, perceived mostly as authoritarian, showed varying degrees of work satisfaction. Work satisfaction emerged as a function of organizational climate, personality and need patterns. [*19]*

Harris and Mossholder (1996) point out that organizational culture stands as the center from which all other factors of human resource management derive. It is believed that culture influences individuals' attitudes concerning outcomes, such as commitment, motivation, morale, and satisfaction *[7]*

Odom, Boxx, and Dunn (1990), found that the bureaucratic culture neither improves nor distracts an employee's commitment and satisfaction. They also found that employee attitudes and behaviors are enhanced by an organizational culture that exhibits innovative characteristics. Additionally, they found that employees who work in a supportive environment express more job-satisfaction *[16]*

Some organizational researchers argue that employing high performance work systems improves organizational productivity and increases job satisfaction (Appelbaum et al. 2000). *[1]*

Other researchers focus more squarely on the promise of bilateral control as a mechanism for workers to have meaningful input into decision making processes even as they directly relate to improving job satisfaction (Hodson 1999). *[8]*

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2.3 Organizational Culture and Job Satisfaction:

Jimfrase and his colleagues propose that the culture of the workplace is the foundation from which workers develop an assessment of appropriate organizational behavior *([9]* And their qualitative analysis highlights that the perceived gap between organizational norms and their actual implementations creates a deeply felt discontent for many workers from a number of social groupings.

Harris and Mossholder (1996) point out that organizational culture stands as the center from which all other factors of human resource management derive. It is believed that culture influences individuals' attitudes concerning outcomes, such as commitment, motivation, morale, and satisfaction. *[7]*

Wallach (1983) has suggested that individual job performance and favorable job outcomes, including job satisfaction, propensity to remain with the organization, and job involvement, depend upon the match between an individual's characteristics and the organization's culture. *[24]*

A study conducted by Odom, Boxx and Dnun (2003) at Mckinnon and co in Taiwan indicates that there is a quite compelling support for the importance organizational culture of in affecting job-satisfaction. They found that the bureaucratic culture neither improves nor distracts an employee's commitment and satisfaction. They also found that employee attitudes and behaviors are enhanced by an organizational culture that exhibits innovative characteristics. Additionally, they found that employees who work in a supportive environment express more job-satisfaction. *[16]*

2.4 Job Satisfaction and turnover:

It has been found that employees who are not satisfied with their jobs will have high turnover. Employees who are satisfied will not have high turnover. Satisfaction is also negatively related to turnover but the co-relation is stronger than what we found in absenteeism. Employee performance is a moderating factor of the satisfaction—Turnover relationship. In recent times a phenomenon amongst the software engineers whose performance is high, their turnover has been noticed as high because of competition for personal growth. Organization lures the competent person for their organizational growth. *[23]*

Organization cares for such high performers and their retention. Poor performers do not leave the organization for fear of lack of job opportunity outside. Dissatisfied workers may express their satisfaction as given in ***Figure.3*** below. The responses are based on two dimensions i.e. constructive/destructive and activity/passivity

Active

Destructive	Exit	Voice	**Constructive**
	Neglect	Loyalty	

Passive

Fig. 3. Expression of dis-satisfaction

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Exit – individual starts searching a new job and resign from the current job.

Voice – employees tries to improve working conditions. In the process suggestion to management are submitted, increased union activates and communication is important.

Loyalty– workers behave passively in situation like external criticism. They wait for things to improve on their own.

Neglect – deliberately and consciously allow conditions to worsen by long absenteeism, lack of interest for quality control, targets, quota, etc. They put in reduced efforts and display lack of interest

3. Scope (An Overview of selected Universe, SAIL—RSP, India)

Rourkela Steel Plant (RSP), the First Temple of Modern India under the ageis of Steel Authority of India Limited is the pride of Orissa. The state's glorious heritage of initiative, enterprise and entrepreneurial brilliance finds its modern expression in the Steel Plant. Rourkela Steel Plant is located in the north-western tip of Orissa and at the heart of a rich mineral belt.

A major producer of diversified range of sophisticated steel products, RSP is an integral part of the Steel Authority of India Limited (SAIL) - a Navratna Company. Built in the late 50's with West German collaboration, RSP was the first integrated steel plant to be set up in the public sector. RSP also pioneered the adoption of the sophisticated LD process of steel making in Asia.

The Plant, initially designed to produce half a million ton (MT) of crude steel per annum, was upgraded to produce 1 million ton of crude steel. The production of hot metal commenced at RSP with the lighting up of its first Blast Furnace **'Parvati'** by the then President of India, His Excellency Dr. Rajendra Prasad on 3rd February, 1959. The other units at the 1 MT stage were commissioned by the early part of 1962.

In order to meet the additional demand for flat products in the country, the capacity of the steel plant was further expanded to 1.8 MT. Commissioning of the expansion units commenced in 1965 and was completed by 1969.In order to overcome technological obsolescence and to continue to remain competitive in the market place, RSP went for further modernization in 1988. The modernization of the Plant was completed in two phases from 1994 to 1999. With this the production capacity of the Steel Plant was augmented to 2 million tons of Hot Metal and 1.8 Million tons of Crude Steel with total Human resource of 12853.

4. Current Research Hypotheses / Research Objectives

In order to bridge the gap and provide organizations with practical assistance in dealing with this issue, this research is aimed towards:

1) Determining the relationship between the organizational culture dimensions and job satisfaction among

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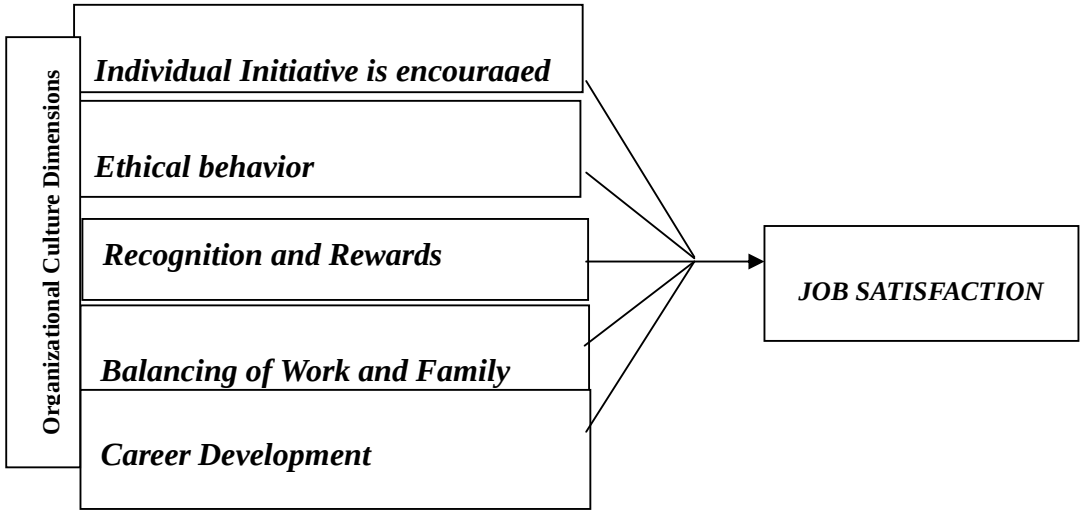
Employee of Indian Public Sector (Steel Authority of India Ltd.-Rourkela Steel Plant)

4.1. Research Framework:

The conceptual schema of this study focuses on the development of a theoretical organizational culture model as a systematic way in measuring the employees' job satisfaction. Examining the
Relationship between the organizational culture and job satisfaction should contribute to our knowledge of the relationship that exists between them.

The link between the dimensions of organizational culture and employees' job satisfaction is illustrated in **Figure 4**. In this theoretical framework, organizational culture dimensions are independent variables and employees' job satisfaction is a dependent variable. The present study thus attempts to bridge the gap by providing a basis for a thorough and insightful discernment of organizational culture and job satisfaction. The model suggests that the greater the extent to which these five dimensions of organizational culture are present, the greater will be the satisfaction of employees

Fig. 4. Research Frame work



4.2. Hypothesis Development:

Based on the extensive study of previous research, it would therefore suggest that organizational culture improves employees' job satisfaction. As such, the following hypothesis is proposed:

H1: Employees perceiving organizational culture dimensions such as Encouragement to Individual initiative, Tolerance to unethical behaviour, value of Ethical behaviour to Profit, Balancing of work and family life are strongly associated with employees' job satisfaction within their respective organizations.

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5. Methodology:

Standard Methodology adopted for this work like sampling procedure, data collection procedures and operational measures of variables used in the study as well as the statistical tests used to evaluate the hypothesis.

5.1 Sampling procedure:

There were 80 (80%) Non-Executive and 20 (20%) Executives respondents Out of this group of respondents, 18% aged were between 25-30 years old, 34% between 30-35 years old and the remaining 48% aged over 35 years old. From the age group results, these organizations consisted of a rather old population with about 48% of them being 30 years of age or older. 62.30% of the sample respondents were married. Out of all the respondents, 65 (65%) had achieved at least a Diploma qualification. Employees from two category were represented in the sample (i.e. Non-executive, N =80; executives, N= 20).

5.2 Variable Measurements:

Independent Variables*: Organizational Culture Dimensions*

This measure is based on the five dimensions of organizational culture developed by Business Research Lab with appropriate changes to make the items more relevant to the present study.

According to Cooke and Rousseau (1988*) [3],* organizational culture is a multidimensional construct, and therefore it is essential to evaluate each dimension. *The five dimensions which consist of 25 items are* supportiveness to individual initiatives; emphasis on rewards; Ethical behaviour, balancing of work and family life, Respect to individual Employee;

Sample items include " Management is flexible and understands the importance of balancing my work and personal life " (Scope for work life balance); " Individual initiative is encouraged at RSP " (emphasis on Initiative/Innovation); " My Company displays values I share " (Recognition and Rewards); "The organization encourages and supports innovation" (innovation); The people at my company always behave in an ethical manner " (Ethical behaviour). The performance appraisal system is fair (Career Development) Responses to these items were made on a five-point Likert format which ranged from 1 = "strongly disagree" to 5 = "strongly agree". The mean Cronbach's alpha coefficient of 0.60 indicated acceptable reliability for the instrument.

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5.3 Dependent Variable: Job Satisfaction

Job satisfaction:

Locke (1976defines job satisfaction as an emotional reaction that "results from the perception that one's job fulfils or allows the fulfillment of one's important job values, providing and to the degree that those values are congruent with one's needs". This was operationalised by a five-item scale adapted from Wright and Cropanzana (1998) reflecting overall general satisfaction with the job. Each item measured a dimension of the satisfaction constructs: degree of satisfaction with the work, co-workers, supervision, total pay and promotional opportunities. Each item requires the respondents to indicate their agreement or disagreement on a five-point scale ranging from 1 = "strongly disagree" to 5 = "strongly agree". Sample items are "All in all, I am satisfied with the work of my job" and "All in all, I am satisfied with my co-workers". The internal consistency reliability coefficient for the scale was 0.87. *[10]*

6. Result of the Survey

6.1. Reliability Analysis

Reliability outcomes for the total sample presented in **Table-1** reflect several interesting findings. The reliability of the questionnaire was tested according to Cronbach's Alpha measurements. The reliability coefficient (Alpha) of each dimension of organizational culture were as follows: Recognition and Rewards (81%); Ethical behavior (64%); Career Development (72%), Balancing of Work and Family Life (70%) and Individual Initiative (69%). The reliability coefficients of all the five dimensions of organizational culture are good, thus adequately meeting the standards for such research (Nunnally, 1967) *[14]*

Table.1: Reliability of Organizational Culture Dimensions (N=100)

Measures	N	Number of Items	Reliability
Recognition and Rewards	100	5	0.81
Ethical Behaviour	100	5	0.64
Individual Initiative	100	4	0.69
Balancing of Work & Family	100	4	0.70

Table .2: Mean, Standard Deviation and Scales of Organizational Culture Dimensions and Job Satisfaction (N=100)

Measures	Mean	SD	Scale
Recognition and Rewards	3.66	0.49	1-5
Ethical Behaviour	3.60	0.62	1-5
Individual Initiative	3.74	0.59	1-5

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life			
Career Development	100	4	0.72
Job satisfaction	100	5	0.87

Balancing of Work & Family life	3.77	0.48	1-5
Career Development	3.90	0.57	1-5
Job satisfaction	3.78	0.58	1-5

6.2. Descriptive Statistical Analysis:

Table-2 indicates that employees within the SAIL-Rourkela Steel Plant, India perceived Career Development(M = 3.90, SD = 0.57) (with the highest mean scores) to be the most dominant organizational culture dimension within their firms and evident to a considerable extent, followed by Balancing of Work & Family life (M = 3.77, SD = 0.48), Individual Initiative (M = 3.74, SD = 0.59), Recognition and Rewards (M = 3.66, SD = 0.49) which were all rated as moderate dimensions of their firm. Emphasis on Ethical Behaviour (M = 3.60, SD = 0.62), with the lowest mean score was perceived on the overall as least practiced within these organizations. Meanwhile, the degree of organizational culture on job satisfaction in these organizations was largely positive. The standard deviations were quite high, indicating the dispersion in a widely-spread distribution. This means that the effects of organizational culture on job satisfaction are an approximation to a normal distribution. This also indicates that respondents were in favour of job satisfaction.

6.3. Correlation Analysis: Relationships between the variables

The correlation matrix in **Table 3** indicates that organizational culture was positively and moderately correlated with employees' satisfaction. There were strong positive relationships between Recognition and Rewards and Job satisfaction (r = 0.71, n = 96, p <0.01). The moderate positive correlations were for Individual Initiative and job satisfaction (r="0.66," n="96," p < 0.01) and between Ethical behavior and job satisfaction (r="0.62," n="96," p < 0.01), Balancing of Work and Family Life and job satisfaction (r="0.59," n="96," p < 0.01). The weakest correlation was for Career Development with job satisfaction (r="0.35," n="96," p < 0.01). The findings show that the respondents who better perceived organizational culture exhibited more positive reactions in favour of employees' satisfaction.

Table.3: Co-relation of Organizational Culture Dimensions and Job Satisfaction (N=100)

Measures	**1**	**2**	**3**	**4**	**5**
Recognition and Rewards					
Ethical Behaviour	0.70#				
Individual Initiative	0.77#	0.63#			
Balancing of Work & Family life	0.70#	0.64#	0.72#		

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Career Development	0.61#	0.37#	0.50#	0.54#	
Job satisfaction	0.71#	0.62#	0.66#	0.59#	0.35#

Co-relation is significant at p<0.01 level [2 tailed test]

7. Conclusion

In summary, this paper reports on an exploratory investigation of the relationship between organizational culture and Job satisfaction based on study of SAIL-Rourkela Steel Plant, India.

The findings stress the need to monitor organizational culture and to evolve better management practices so that employees' satisfaction is maintained at a high level. In other words, the findings could prescribe potential practical implications for managers in management development programmes consistent with the training needs of the employees in the organization. Hence, employees will be likely to perform better and feel a high level of job satisfaction, and in turn will develop more commitment towards their organizations. Finally, the higher levels of employees' satisfaction in such organizations may give an advantage over other organizations in attracting and retaining employees in a competitive environment.

It is concluded that, organizational culture does play an important role in promoting the job satisfaction for employees towards the organizational success, and this could only be achieved by ensuring that an appropriate culture was being developed or shaped in the organization that matched managerial values, attitudes and behaviours .Evidently, organizational culture does affect employees' job satisfaction. This study shows that there is a positive relationship between organizational culture and employee job satisfaction.

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ISSN 2076-9202

FINANCIAL LITERACY AND DECISION MAKING: AN OVERVIEW FROM TUNISIA

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Abstract: *Individual's decisions and successive actions flow from their understanding of the atmosphere in which they operate. In order to make easy economic and financial sustainability, persons need to the cognitive ability to understand financial information in the context of these surroundings. The intellectual construct inferred from this encompassing and complex process is financial literacy.*
The expression 'financial literacy' consists of the words financial and literacy, both of which are used to symbolize a myriad of issues that can easily lose their relevance when used together. This article addresses the interface (or gap) between information (matter) and mind, is explored by means of a literature review and an empirical survey. From the survey, respondents' perceptions of the financial literacy construct were gleaned. Awareness of financial literacy from the interface perspective promotes a deeper appreciative of the concept.
Keywords: *financial literacy, organization, decision makers, financial information.*

1. INTRODUCTION

The understanding of how organizations manage information, especially financial information, has a significant effect on decision-makers' ability to plan strategies and create a competitive advantage. Meaningful information can be regarded as communicated knowledge, and according to Ditillo (2004: 401), the understanding of how an entity can manage knowledge is an issue that has received increasing attention in both theory and practice over the past decade. He also states that "knowledge and the capability to create and utilise such knowledge are the most important sources of competitive advantage" in organizations. Knowledge creation focuses attention on both information and individuals' ability to use

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it. Edwards, Collier and Shaw (2003: 35) also regard organizational knowledge as an asset, "the use of which is a key driver of competitive advantage".

Nowadays, financial management responsibilities are widely diffused and are no longer the exclusive interest of the chief financial officer (CFO); this demands a high degree of financial literacy from managers throughout the organization (Beauchamp and Hicks 2005).

The main purpose of this study is to address the financial literacy construct servings as an interface between financial information and decision-makers in organizations.

2. Background

General literacy refers to a person's ability to read and write (Zarcadoolas, Pleasant, and Greer 2006). The standard definition of literacy developed by the Literacy Definition Committee and used by the National Adult Literacy Survey is "using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential" (Kirsch et al. 2001, p. 3). When operationalized, this definition covers three broad areas—prose (written information), document (tabular/graphical information) and quantitative (arithmetic and numerical information)—each with its own standardized testing instrument (Kirsch et al. 2001). Literacy in the broadest sense consists of understanding (i.e., knowledge of words, symbols and arithmetic operations) and use (ability to read, write and calculate) of materials related to prose, document and quantitative information.

This idea of literacy has been expanded to the study of particular skill sets, for example computer literacy (Wecker, Kohnle, and Fischer 2007), statistical literacy (Callingham and Watson 2005) and health literacy (Baker 2006). The Educational Testing Service (ETS) identifies four types of literacy: prose, document, quantitative and health skills. ETS offers two sets of adult literacy tests (available at www.ets.org). Each type of literacy measures how well an individual can understand and use information. For example, health literacy measures how well an individual can understand and use health-related information related to five activities (health promotion, health protection, disease prevention, health care maintenance and systems navigation). Like general or health literacy, financial literacy could be conceptualized as having two dimensions—understanding (personal finance knowledge) and use (personal finance application) (Figure 1) (Huston 2009).

Although several financial literacy definitions have been proposed, there is no universally accepted meaning. Following the proposed financial literacy conceptual framework depicted in Figure 1, financial literacy could be defined as measuring how well an individual can understand and use personal finance-related information. This definition is direct, does not contradict existing definitions within the literature and is consistent with other standardized literacy constructs.

According to international studies on financial literacy, the factors that make financial education increasingly important include changing demographic profiles, the growing complexity of the financial sectors, and the decrease in personal savings while personal indebtedness is increasing. The organization

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for economic cooperation and development's financial understanding is low among consumers across their 30 member countries and that consumers, among other things, feel that they know more about financial matters than is actually the case. The surveys also reported that consumers believe that financial information is difficult to find and understand (OECD: 98).

3. Problem statement and objective of the study:

The problem addressed in this article relates to the complexity of the financial literacy phenomena to act as an interface between financial information and the decision-making proficiency of individuals in organizations.

This phenomenon can be conceptualized in the following dimensions: it involves the haphazard use of the term "financial literacy", secondly, it relates to the perception that financial literacy involves two separate systems(the information system and the human behavior system), which means that it is not regarded as a single encompassing process, and thirdly, the gap between complex financial and economic information, on the one hand, and decision –makers' mental processes, on the other, is difficult to reconcile without using an interface.

The research problem focuses specifically on the complexity of the financial literacy construct with regard to its role in organizations. The problem is further exacerbated by the fact that the majority of existing financial literacy programs focus on financial literacy at consumer level rather than in relation to organizations. Hence, before financial literacy education for decision-makers in organizations can be contemplated, it is necessary to determine the decision-makers 'perception of the financial literacy construct.

The objective of this article is to investigate how individuals decision-makers in organizations perceive the financial literacy construct, as well as how it is perceived by the various economic sectors and decision-making levels. In order to achieve this objective, a literature study on the complexity of financial literacy in organizations was conducted. This was followed by an empirical study of decision-makers' perception of the financial literacy construct from an organizational point of view.

4. Method

Our empirical study is based on qualitative research. We use a questionnaire as a method of data collection. Our questionnaire consists of the two main parts: The questionnaire investigated the perception of decision-makers at different levels of the organization on the financial literacy concept and their perceptions of the financial literacy proficiencies needed by decision-makers in organizations. Furthermore, the questionnaire tests the respondents' level of financial education in the second section.

5. Questionnaire

The questionnaire was designed to assess the perception of the financial literacy concept of individuals participating in different economic activities and decision making categories.

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Section A of the questionnaire focused on the financial literacy concept and comprised statements relating to financial literacy for decision-making in an organization. The statements in this section were evaluated on a five-point agreement Lickert scale rating.

Section B: of the questionnaire test the respondents' level of financial education. The financial literacy questions are composed of 3 questions. These questions aim to assess basic financial literacy. The questions cover topics ranging from the workings of interest rates and interest compounding to the effect of inflation, discounting, and nominal versus real values. These questions were designed using similar modules in the HRS and a variety of other surveys on financial literacy. Households are instructed to answer the questions without consulting additional information or using a calculator. The exact wording of the questions measuring basic financial literacy is reported in table1.

6. Sample choice and response rate

Since the total population of decision-makers in organizations could not be determined, use was made of purposive sampling. The sample chosen for the empirical survey comprised members of organizations in the economic categories (primary, secondary, and tertiary, and government, parastatal and academic sectors).

Table 1 provides a summary of the sample size, completed questionnaires and response rate by sector. Due to confidentiality considerations, the names of the chosen organizations that participated per sector were not listed.

Table 1: summary of responses to the distributed questionnaires

Sector	Sample	Completed questionnaires	Response rate (%)
Primary sector	33	12	36.36%
Secondary sector	42	35	83.33%
Tertiary sector	57	51	89.47%
Government sector and parastatal	53	41	77.35%
Academic	20	11	55%
Total	205	150	73.17%

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7. Summary of the results

7.1 Perceptions of individual decision-makers on financial literacy construct:

This section addresses the objective of how individual decision-makers perceive the financial literacy construct and the need for financial literacy in an organizational context.

Section A: of the questionnaire contained statements testing the respondents 'perceptions of the financial literacy concept, also, the participants had to indicate their perceptions of the current status or need for financial literacy for decision-making in organizations. The research findings from section A of this questionnaire are summarized in table 3.

Table 2: Responses to statements on financial literacy for decision making in organizations

Statement	Rating scale (%)					
	Strongly disagree	disagree	unsure	agree	Strongly agree	Total
1-Les connaissances financières guident contre les risques liés à la prise de décision.	**0**	**0**	**14**	**34.66**	**51**	**100**
2-Les connaissances financières sont un processus à suivre plutôt que d'un résultat obtenu.	**0**	**5.33**	**1.33**	**53.33**	**24**	**100**
3-Il sera dans l'intérêt général de votre organisation si les décideurs ont tout un niveau des compétences financières.	**18**	**0**	**0**	**29.33**	**51.33**	**100**
4-Les employés de votre organisation n'ont pas besoin d'une formation financière pour comprendre comment on évalue la réussite de l'entreprise.	**66.66**	**24**	**0**	**8**	**1.33**	**100**
5-Les cadres supérieurs doivent comprendre la signification des rapports financiers afin d'évaluer la	**0.66**	**0**	**8**	**58.66**	**32.66**	**100**

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performance de leur organisation.						
6-il est difficile de comprendre les états financiers de votre organisation.	**3.33**	**36.66**	**6**	**30**	**24**	**100**
7-En général, il ya un manque des gens qui possèdent des compétences financières aux postes décisionnels.	**2**	**12.66**	**6**	**64**	**15.33**	**100**

In statement (1), a great number of respondents 85.66% agreed or strongly agreed that financial literacy mitigate against the risks involved in decision-making. In this regard, Bernstein (1998); concurs that individuals can test their own degree of risk aversion by determining their certainty "equivalent". Thus, the more financially literate decision-makers are, the higher their certainty equivalent will be. One can therefore deduce that financially literate decision-makers are better equipped to make a trade-off between risk and return.

Regarding statement (2), 77.33% of the respondents agreed or strongly agreed that financial literacy is a process to be followed rather than an achieved result. Financial literacy is a lifelong process. Because economic circumstances continually change, decision-makers'fianncial knowledge and skills have to adapt to these changes. Although 1.33% of the respondents were unsure, and 5.33% of them disagree. Widdowson and Hailwood (2007) contend that 'financial literate can influence the allocation of resource in the economy'. Financially literate decision-makers are likely to choose more wisely when they allocate the organization's resources.

In statement (3), 80.66% agreed or strongly agreed that 'it will be to the overall benefit of your organization if decision-makers at all levels are financially literate. 'Zulauf (2003) confirms that "entrepreneurs and governmental organizations a like recognize that financial literacy contributes greatly to financial success."

In statement (4), 90.6 % of the participants disagree or strongly disagree that employees in an organization do not need financial training to understand the basics of how business success is measured.

Of the respondents, 91.32% agreed or strongly agreed with statement (5) that senior managers have to understand the meaning of financial ratios in order to evaluate their organizations' performance. Although it is necessary for managers to understand the meaning of financial ratios, Brooks (2007) mentions "the extremely important need for non-financial managers to know about and recognize the limitations of ratio analysis". Although, 54% of the respondents strongly agreed or agreed that, in statement (6), "managers seldom admit that they do not know how to read their organization's financial statements".

This corroborates Berman's (2001) concern that 60% of the employees cannot read an income statement.

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Hence 79.33% agreed with statement (7) that there is a general shortage of financially literate people in decision-making positions.

7.2 Basic financial literacy index:

The measures of financial literacy used in existing studies are often crude, for example Lusardi and Mitchell (2006, 2007a) rely on only three questions to measure financial literacy, and Stango and Zinman (2007) rely on one question.

1-Suppose you had 100D in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

(1)More than 102D, (2) Less than 102D, (3) exactly 102D, (4) Do not know.

2-Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

(1)More than today, (2) Exactly the same, (3) Less than today ;(4) Do not know.

3- If interest rates rise, what will typically happen to bond prices?

(1)They will rise, (2) they will fall, (3) Do not know, (4) Do not know.

The first two questions, which we refer to as "interest rate" and "inflation", help evaluate whether respondents display knowledge of fundamental economic concepts and basic numeracy. The third question, which refers to as "compounding interest", evaluates respondents' knowledge of compounding interest (interest rate and bond prices).

The table shows that 65.33% of respondents correctly answered the interest rate calculation question; so it is surprising that many were unable to respond correctly.

By contrast, only 12 % of the respondents knew that the bond prices will fall if the interest rates rise.

Table 4: Answers for standard measures - Weighted percentages

question	Simple interest	inflation	Compounding interest
Correct	65.33%	37.33%	12%
Incorrect	32.66%	50.66%	57.33%
DK/Refuse	2%	10%	54.66%

In our questionnaire we asked respondents to report on a scale from high to low their understanding of economics. Such a question has the advantage of being simple. Note also that the question is located at the beginning of the literacy set of questions included in the basic financial literacy index is asked. Thus, respondents have to assess their own knowledge before they answer the literacy questions: How would you assess your understanding of economics?

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Table 5: Answers for self-assessment understanding of economics - Weighted percentages

Question	high	Average	low	DK/Refuse
Weighted percentages	2%	54%	43.33%	0.66%

Most respondents assessed their economic knowledge as being above 2: (54%) at (2); (43.33%) at (3). Only (2%) reported their knowledge of economics as being high (1). Importantly, there is a very strong correlation between objective and subjective literacy. More, the most of respondents who report knowing a low about economics (scale 2 or 3) are located in lowest quartile of the basic literacy index.

More than (43%) of respondents declare to have a low of financial culture. Those results suggest that people have indeed a low level of financial literacy and that they are aware of their shortcomings. It also shows that measuring financial literacy is not an easy task. We have to bear in mind that measurement errors are inherent to assessing such complex concepts.

7.3 Most important source of advice for different level of literacy:

This table shows, for different levels of basic financial literacy, the sources of advice used in making important financial decisions. We group the basic literacy measures in four quartiles and report weighted percentages of households within each literacy quartile using a specific source of information. An important question we aim to answer in our paper is not only whether respondents possess financial literacy but also whether financial literacy matters in financial decision-making.

We do so by first examining whether literacy influences the sources of information households consult when making financial decision.

To shed some light on why literacy affects financial behavior; we then examine whether financial literacy affects financial behavior.

Table 6: Answers for most important source of advice: Weighted percentages

source	Media, internet, newspaper	Friends, parents acquaintances	Employee of financial institution	Professional financial advisers
Weighted percentages	54%	13.33%	6.66%	26.%

The analysis shows that a high proportion of respondents, with low basic literacy, rely on informal sources of information, such as a family, friends and acquaintances. However, this proportion sharply decreases when we move to higher levels of basic literacy.

Conversely, the proportion of households relying on newspapers, financial magazines, guides and books

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and financial information on the internet increases substantially as we move from low to high levels of basic literacy. Households with higher financial literacy are also more likely to rely on professional financial advisers. This table shows that financial literacy is strongly connected with sources of financial advice. Insofar, as financial advice is an input in financial decision-making and leads to better saving and investment decisions.

8. Conclusion

With reference to the research problem and the results of the literature study and empirical survey, financial literacy can be regarded as one of the basic requirements needed to facilitate sound financial decision-making in organizations. There is also general agreement that there is a dire need for financially literate individuals, who can participate fully in the various management levels of an organization.

The main problem in organizations is that only a few key players, especially that financial department, understand intricate financial reports and the annual financial reporting. Employees in organizations require financial training to understand the basics of how business success is measured. In this paper, we show that lack of understanding of economics and finance is widespread.

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ISSN 2076-9202

The impact of interest rate and exchange rate volatility on bank's returns and volatility: Evidence from Tunisian

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Abstract

This study specially investigates the effect of the market index, interest rate and foreign exchange rate risk on Tunisian banks stock returns using the OLS and GARCH estimation models. These results suggest that exchange rate and market index have an impact and an important role in determining the dynamics on the conditional bank stock return. However, interest rates do not appear to be significant factors in the Tunisian bank return. The results further indicate that long-return interest rate and exchange rate volatility are the major determinants of the conditional bank stock return volatility.

Keywords: Market Risk, Market Index, Interest Rate Risk, Foreign Exchange Risk, Bank Stock Returns and GARCH.

1. Introduction

The banking business is like any business because of the specific risks it poses to the community: loss of depositors' savings crisis, systematic failure of one or more credit institutions of the entire banking system. In addition, the system is regularly confronted with a difficulty although this sector is one of the most regulated economies. The most recent example is the subprime crisis. This crisis leads to bank failures with adverse consequences on the real economy across the world. It is therefore imperative to protect the depositors against these bank failures in an environment characterized by the existence of market imperfections (Dewatripont and Tirole, 1994). These failures can lead to a systemic crisis (Bhattachary and Thakor, 1993) where social cost are higher than the private ones therefore, risk is at the heart of the banking business. Moreover, the high volatility in interest rates in recent years a long with the significant level of financial leverage for most companies has also contributed to the growing relevance of interest rate exposure.

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The impact of interest rate and exchange rate changes on banks' stock returns has been of major interest to bank managers, regulatory authorities, academic communities and investors, since the failure of numerous banks has been especially attributed to the adverse impacts of fluctuations in interest rates and exchange rates.

The issue of interest rate risk is of major interest to the banking, regulatory, and academic communities. The Interest rate risk (IRR, hereafter) is acknowledged as one of the major financial risks borne by companies. This is due to the fact that changes in interest rates affect both a firm's expected cash flows and the discount rates used to value them. As a matter of fact, the only two studies that have employed a nonparametric approach in the context of corporate exposure to risk have focused on exchange rate exposure (Guo and Wu, 1998; Aysun and Guldi, 2009). In the study we will focus on the impact of interest rate and exchange rate volatility on bank's returns and volatility: Evidence from Tunisian.

2. Literature review

Early studies of bank interest rate sensitivity include the works of stone (1994), Lloy and Shicks (1977), Chance and Lane (1980), Lynge and Zumwalt (1980), Flannery and Janes (1984), Booth and officer (1985), Scott and Peter-son (1986), and Bae (1990). These authors apply a tow –index model market and interest rate factors) to bank equity returns under the assumption of constant variance error terms.

Saunders and Yourougou (1994) contrast the effect of interest rate changes on banking and non-banking firms during periods of rel- active interest rate stability (pre-october 1979) and high interest rate volatility, (post-october 1979) and report that interest rate effects vary substantially over time. In addition, Yourougou, (1990) explained that the interest rate and exchange rates have a significant impact on these hares of financial institutions including banks. Moreover, (Kessel, 1956, Bach and Ando, 1957, French et al, 1983) explained the sensitivity of banks' interest rate, given the composition of their balance sheets. The first empirical studies have drawn attention to the risk of exchange rate on bank stock returns were generated by Grammatikos and al, 1986 and Chamberlain et al 1997.The results of these studies have shown that U.S. banks were exposed to the risk of exchange rate. Furthermore, by employing the same three-factor model to return the generating process of Korean banks, Hahm (2004)concluded on the risk of interest rate risk and exchange rate in that Korean bank stock returns were sensitive to those factors. His work shows that Korean commercial banks have been very involved with the risk of interest rate and currency risk. The result also shows that the efficiency of Korean banks is significantly associated with the degree of interest rate and credit policy.

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Most of existing studies concentrate on the interest rate and exchange rate sensitivity of bank stock returns separately by employing different methodologies. This variation in turn gives rise to different empirical results. Song (1994) was the first study to employ the ARCH –type methodology in banking. Song finds ARCH-type modeling as the appropriate framework for analysis of bank stock return. These studies mainly use linear estimation methods such as OLS and do not consider the sensitivities of bank stock return to both interest rates and exchange rates factors which are time-varying. Whatever empirical studies were used ARCH-type models to capture variation over timeline this regard, the literature has overwhelmingly highlighted this gap more in North America and it is clear from a comparison with international studies which cited examples such asMadura and Zarruk (1995), Adjaoud and Rahman (1996) and Rasad rajan (1995), Choi et al (1998) and Chamberlain et al (1997). They have examined the interaction between partners were market interest rate and exchange rate in U.S financial institutions. In addition, there is another similar empirical work that was conducted by Suzannak et al (2004) who explained the Market, interest rate and foreign exchange rate risk in Australian banking. Even more work was conducted by Saadat Kasman and al (2011) who explained the impact of interest rate and exchange rate volatility on banks' stock returns and volatility: Evidence from Turkey.

3. Methodology

3.1. Model specification

- *Linear Regression*

Most research into market, interest rate and foreign exchange rate risk in banking has been undertaken using single or multi-factor least squares regression where by the parameter estimates provide an indication of risk sensitivity. Examples of two-factor models, largely concerned with market and interest rate risk, include Chance and Lane (1980), Lynge and Zumwalt (1980), Flannery and James (1982, 1984a, 1984b), Booth and Officer (1985), Kane and Unal (1988), Akella and Chen (1990), Brewer and Lee (1990), Madura and Zurruk (1995), and Adjaoud and Rahman (1996). Alternatively, Choi, et al. (1992) and Wetmore and Brick (1994) have employed a three-factor approach to model market, interest rate and foreign exchange rate risk simultaneously.

- *GARCH model*

The sensitivity of bank stock returns to both interest rate and exchange rate changes are time-varying. The crisis is identified with volatility spikes then refers to the extension of the uncertainty in the financial markets. The most common method used to test externalities volatility estimation models in the ARCH.

Since the introduction of the autoregressive conditional heteroscedasticity (ARCH) by Engle (1982), ARCH-type modelling has become the standard econometric approach for describing dynamics of

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changing variances of time series with heteroscedasticity. In this perspective, an important extension of the generalized autoregressive conditional heteroscedastic (GARCH) is suggested by Bollerslev (1986).The GARCH (p, q) is a form of ARMA model on the conditional variance. This approach requires fewer parameters to estimate the formulation ARCH (p) model for the phenomena of persistence of shocks. The conditional variance of the study variable is determined by the square of the error terms p and q past conditional variances delayed. GARCH models have proven their ability to capture the following properties: The first is that volatility clustering, large variations tend to be followed by large changes, and small changes by small changes. It is a leveraged finance.

The second property is specific to fat tails of financial time series: financial series are generally characterized by a leptokurtic distribution that is away from a normal distribution. Tails of distributions are thicker than those of a normal distribution, which reflects the presence of extreme event.

Process ARCH (q) is given by: $\sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-1}^2$

Where $\alpha_0 > 0$ and $\alpha_i \geq 0$ for all itches constraints help ensure the positivity of the conditional variance.

A GARCH (p, q) is defined by: $\sigma_t^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-1}^2 + \sum_{j=1}^{p} \beta_j \sigma_{t-j}^2$

$\alpha_0 > 0, \alpha_i, \beta_j \geq 0$.

Leptokurtic characteristics, heteroscedasticity and clustering of volatility that characterize high-frequency financial time series are correctly modeled by the GARCH process, since they can capture the persistence of volatility shocks using the parameters $\alpha_i$and βj the conditional variance equation. ARCH models (allowing thus eliminating problems of heteroscedasticity) were used to study the propagation of volatility (spillovers) as a main feature of the stock market volatility. Variability over time in volatility is now generally accepted and modeled through ARCH type specifications (as in Bollerslev, 1987, and Engle and Lee, 1994).According to the logic of portfolio choice models, volatility plays a crucial role in determining the performance, a more risky way is supposed to provide superior performance, this effect has been measured primarily through ARCH-M model, in which volatility is directly introduced as an explanatory variable performance (Engle et al, 1987).

Some authors (eg Schwert, 1990) showed that, conversely, the yield may be involved in explaining the volatility. It is then the effect of asymmetry (or leverage), because the reaction of volatility to a shock on output is different depending on the sign of shock: there is usually a shock down performance increases the higher the volatility, all other things being equal, a shock on the rise. These interactions appear to be relatively robust to account for the dynamics of most financial asset prices (stock indices and exchange rates in particular).We can then see that the quadratic specification in the conditional variance equation obscures the characteristic asymmetry of shocks. However, ARCH and GARCH models by establishing a quadratic relationship between the error variance can not take into account the volatility skew. In other words, volatility tends to rise in response to bad news (expected returns lower than

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expected) and decrease to good news (expected returns higher than expected).Indeed, the most used models for series modeling financial and market models are ARCH (Engle, 1982) and GARCH (Bollerslev, 1986).Both models have shown through modeling the conditional variance of the series studied as a linear function of past squared errors, which can provide estimates where the estimated parameters are highly statistically significant, but which are not stable through time. Hamilton and Susmel (1994) have addressed this problem by introducing the SWARCH model that allows data to follow several ARCH models.

3.2. The data

The construction of our econometric model GARCH is made on the basis a sample that consists of 10 Tunisian commercial bank stocks listed on the stock exchange of Tunisian. The information gathered on the banks, are listed on the principal market, the evolution of stock prices traded and the evolution of sector indices are monthly data for the period 2007 until to 2011.In the empirical part we use a data set consisting of: course of action, volume of transactions, foreign exchange rates, interest rates, risk-free interest rate and market index that we consider to be the most important and the most promising model formulation type ARCH and GARCH as representative as explanatory variables. And as our sample is given monthly to a period ranging from January 2007 to December 2011. Our data source is the BVMT and the BCT. These variables are applied to 10 Tunisian banks traded.

3.3. Empirical model

The seminal autoregressive Conditional Heteroscedastic model (ARCH introduced by Engle (1982), to model this phenomenon has given a huge push to both econometric model building and applied research, is used in order to compensate for the lack of representation ARMA (p, q) for monetary and financial problems. Engle's process proposed to model time varying conditional volatility using past innovations to estimate the variance of the series. Based on the ARCH model, Bollerslev (1986) suggested the more widely used generalized autoregressive conditional heteroscedastic model (GARCH), which is an important type of time series model for heteroscedastic data. GARCH model (p) generates episodes of high volatility followed by periods of low volatility. The effect of ARCH or conditional heteroscedastic is the presence of auto correlation in the residuals squared. There are two main approaches to identify. The first known non Engle test is a lagrange multiplier test TR^2 regression, namely the size of the sample multiple R square which follows a chi-square with p degrees of freedom which analyze the presence of ARCH effect. The second approach is Mcleod test which is similar to that ljuing-Box test for the difference in the squared residuals, which are measured as follows.

The transition to the impact of interest rate and exchange rate volatility on banks stock returns requires understanding not only of the sensitivity of bank stock returns and changes in interest rates but also the volatility of exchange rates. This cannot be achieved without using both the OLS and the standard GARCH model. Most empirical studies use OLS to estimate the effect of interest rates and

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changes in exchange rates on banks' stock returns. The following model is estimated with OLS:

$$r_t = \beta_0 + \beta_1 MRK_t + \beta_2 INT_t + \beta_3 FX_t + \mu_t \quad \textbf{(1)}$$

Where r_t is the return of the ith stock return at time t, MRK_t is the return of the market index, INT_t is the return of a risk- free interest rate or bond index; and, FX_t is the return of the foreign exchange rate. β_0 is the intercept term and μ_t, is an error term with the assumption of an iid condition. The equation OLS estimation is tested with the test ARCH. The ARCH process was generalized by Bollerslev (1986) with GARCH (Generalized autoregressive conditional heteroskedasticity). The GARCH (1, 1) is specified as follows:

$$r_t = \gamma_0 + \gamma_1 MRK_t + \gamma_2 INT_t + \gamma_3 FX_t + \varepsilon_t$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta\, \sigma_{t-1}^2 \quad \textbf{(2)}$$

This model takes into account the variance of returns for previous periods and random shocks to model future returns, capturing the stochastic nature of this variance. In addition, they exhibit nonlinear dynamics that captures the impact of skewness observed in financial series. A GARCH models the variance of the following form:

$$r_t = y_0 + \varepsilon_t$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2 + \theta_1 INT_t^2 + \theta_2 FX_t^2 \quad \textbf{(3)}$$

INT^2 is the interest rate and FX^2 is the return volatility of exchange rates, α_1 is ARCH coefficient, and β is the coefficient of GARCH model .GARCH model contains two parameters to specify the number of delayed shock squared (p) and conditional variance (q) to consider, where its general form GARCH (p, q).

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4. Empirical results

Table 1: Descriptive statistics

Variables	Mean	Standard error	Skewness	Kurtosis	Jarque-Bera	ADF
ATB	5.271	0.223	1.373	2.628	7.228** (0,026)	-7.202
BIAT	38.446	1.890	1.431	3.341	9.683 ** (0,017)	-4.232
BNA	12.778	5.148	0.409	-2.141	2.629 ** (0,026)	-6.396
Attijari Bank	7.633	0.356	0.158	-1.390	1.017 ** (0,016)	-5.958
STB	11.281	1.253	1.406	0.917	4.374** (0,011)	-5.779
UBCI	33.484	2.252	1.080	-0.212	2.356 ** (0,031)	-10.65
BH	22.900	1.212	0.208	-0.763	0.377** (0,021)	-11.15
Amen Bank	25.749	2.428	-0.402	-1.438	1.359** (0,050)	-31.69
BTE	30.451	0.823	0.770	-0.082	1.191 ** (0,045)	-6.383
UIB	15.268	1.570	0.130	-1.439	1.070 ** (0,048)	-9.551
MRK	0.980	30.67	0.095	8.144	157.646 ** (0,014)	-8.099

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FX	5.138	0.368	-0.385	0.229	1.536 ** (0 ,028)	-5.490
INT	5.138	0.368	-0.385	0.229	1.592 ** (0,015)	-6.490

Note: MRK, FX and INT, market index return, foreign exchange rate and interest rate respectively.

**: Indicates the significance level at 5%.

After applying the ADF tests on the return series, the empirical results indicate that all series are stationary

4.1. Detecting the presence of ARCH effect

According cf. Berra and Higgins (1993), if the unconditional kurtosis is always greater than the normal distribution it indicates that the process is in liptokurtique. r_t This is the second reason, the conditional variance with time-dependent for which the ARCH process is used to represent financial series or residuals of a linear model defined on financial time series which allows to pass the ARCH model estimation.

Table 2: Result of the detecting the presence of ARCH effect

	Test de Mcleod Ljuing Box (Q-stat			**Test de Lagrange multiplicateur** (TR^2)		
Banks	**Stock Return**	**Transaction volume**	**Interest Rate**	**Stock Return**	**Transaction volume**	**Interest Rate**
ATB	387.654 (0.001)*	487.65 (0.000)*	317.22 (0.000)*	4.34 (0.000)*	7.51 (0.03)*	6.98 (0.02)*
BIAT	487.256 (0.000)*	391.25 (0.001)*	421.57 (0.000)*	3 .453 (0.000)*	8.42 (0.02)*	6.77 (0.03)*
BNA	398.127 (0.003)*	318.74 (0.000)*	531.74 (0.000)*	0.699 (0.000)*	9.41 (0.00)*	7.54 (0.00)*
Attijari B	456.785 (0.000)*	402.38 (0.000)*	458.32 (0.000)*	6.769 (0.000)*	10.51 (0.02)*	7.84 (0.00)*
STB	356.182 (0.001)*	476.28 (0.000)*	427.51 (0.000)*	4.047 (0.000)*	7.81 (0.00)*	8.21 (0.03)*
UBCI	423.857	428.67	483.61	5.685	8.57	8.54

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	(0.000)*	(0.003)*	(0.000)*	(0.000)*	(0.00)*	(0.022)*
BH	465.289	452.36	428.34	5.369	9.20	9.57
	(0.000)*	(0.000)*	(0.000)*	(0.000)	(0.00)*	(0.000)*
Amen Bank	458.267	436.48	412.68	8.457	7.53	6.57
	(0.000)	(0.005)*	(0.000)*	(0.000)*	(0.000)*	(0.000)*
BTE	278.618	437.36	473.64	4.295	7.59	7.54
	(0.000)*	(0.000)*	(0.000)*	(0.000)*	(0.003)*	(0.03)*
UIB	387.159	358.47	246.201	6.190	8.63	7.280
	(0.000)*	(0.006)*	(0.002)*	(0.000)*	(0.002)*	(0.003)*
Exchange rate		532.18		7.578		
		(0.000)*		(0.001)*		
Market index		357.24		6.87		
		(0.000)*		(0.00)*		

Note: Numbers in parentheses indicate the standard errors.

*: indicates the significance level at 1.

From Table 2, the application of two tests, test Ljuing Box and Lagrange multiplier test (TR^2) show that for all series of residues, the probability associated with two statistical tests is very low and zero in two tests which reject all series, The assumption of homoscedasticity in favor of alternative conditional heteroscedasticity . Therefore it rejects the hypothesis of no ARCH effect exists. This conditional heteroscedasticity ARCH effect or there in this series is defined as the presence of autocorrelation in the squared residuals which favors the presence of a combination of volatility (volatility clustering). From this table we note the existence of autocorrelation or heteroscedasticity thereby rejecting the null hypothesis, that is to say there is no ARCH effect.

4.2. OLS estimation

Table 3: Estimates of OLS regression of individual banks and portfolio

Banks	**(β_0)**	**(β_1)**	**(β_2)**	**(β_3)**	**ARCH**	**R^2**
ATB	27.968	0.000	0.530	-22.915**	8.52*	0.073
	(0.140)	(0.994)		(0.0424)		
			(0.848)			
BIAT					9.24**	0.004

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	17.532	0.005		-4.811		
	(0.347)	(0.259)	-1.963	(0.671)		
			(0.457)			
BNA	-60.796	0.0263	-1.479	50.472	21.23**	0.011
	(0.618)	(0.651)		(0.484)		
			(0.934)			
Attijari	37.340**	0.002	-1.332	-21.748**	35.23*	0.083
Bank	(0.046)	(0.713)		(0.049)		
			(0.624)			
STB	-0.945	0.023**	0.803	-2.459	43.23*	0.068
	(0.971)	(0.052)		(0.874)		
			(0.836)			
UBCI	50.436**	0.001	-3.592	-23.536***	54.23*	0.093
	(0.022)	(0.853)		(0.069)		
			(0.263)			
BH	8.120	0.009***	2.291	-15.109	54.89*	0.089
	(0.645)	(0.089)		(0.149)		
			(0.381)			
Amen Bank	-3.249	0.013**	2.699	-6.899	42.37*	0.101
	(0.836)	(0.041)		(0.460)		
			(0.247)			
BTE	0.451	-3.974	-9.007	-3.091**	58.36*	0.072
	(0.391)	(0.663)		(0.045)		
			(0.763)			

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UIB	-2.640	0.017*	0.012	1.894	8.42*	0.103
	(0.862)	(0.014)		(0.833)		
			(0.995)			

Note: Numbers in parentheses indicate the standard errors.

*: indicates the significance level at 1.

**: indicates the significance level at 5%.

***: indicates the significance level at 10%.

Table 3 reports the results of the OLS estimation. The variable of the market risk are positive for all individual bank and portfolio return except BTE bank which are negative. In addition, the coefficients of market risk are statistically significant in only 4 banks (STB, BH, Amen Bank and UIB) compared with 10 banks with a positive effect. Moreover, the results show that the market returns explains a modest proportion of bank returns, compared to interest rates and exchange rates returns. Evidence of the interest rate is not significant for all individual banks and portfolio return and a negative effect in only 5 of 10 cases, therefore, we see that the market risk is considered the most important by the interest rate which has no impact of the bank stock return. The coefficient of exchange rate, are negative for all individual bank and portfolio return expect BNA and UIB banks, and statistically significant in 4 out of 10 cases. Evidence of exchange rate sensitivity is stronger compared to the interest rate since the latter is not significant for all individual bank and portfolio return. Overall, most of the impact on the individual bank and portfolio returns is associated with the overall market returns and the exchange rate return, This result is confirmed by the study of Saadet Kaasman, Gulin Vardar and Gokce Tunc (2011) who find that the market return and the exchange rate has an impact of the individual bank and portfolio return, but the interest rates return has a small effect (significant in only 4 out of 14) of the bank return in Turkey. In addition, we note the presence of the ARCH effect has an impact on the series of bank returns this present for all banks and the portfolio return level analysis. For R^2 is a statistic that will give some information about the best fit of a model. In this table, we see that the quality of model is fitting for low subject in all cases.

At the equation OLS, if the squared residuals contain autocorrelation or hetroscedasticity, it is likely that the null hypothesis will be reject, OLS is not, in this case, the best methods to estimate the model, why we should have tests to detect it.

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4.3. Estimation of return with GARCH (1, 1) model

Table 4: Estimation of return

Bank	(γ_0)	(γ_1)	(γ_2)	(γ_3)	(α_0)	(α_1)	(β)	$\alpha_1 + \beta$
ATB	27.795	-0.001	0.472	-22.560 ***	19.665***	0.9367 **	0.0538	0.990
	(0.182)	(0.846)	(0.866)	(0.083)	(0.090)	(0.015)	(0.669)	
BIAT	16.481	0.006	-1.965	-4.066	33.244	0.1923	0.148	0.34
	(0.397)	(0.241)	(0.468)	(0.732)	(0.131)	(0.412)	(0.715)	
BNA	-78.584	0.027	-1.774	64.404	88.813	8.3779 **	-0.000	8.377
	(0.556)	(0.653)	(0.923)	(0.433)	(0.161)	(0.013)	(0.735)	
Attijari	37.075***	0.002	-1.355	-21.457 ***	41.592*	-0.086 *	0.379 *	0.293
bank	(0.061)	(0.760)	(0.615)	(0.077)	(0.000)	(0.000)	(0.000)	
STB	-1.585	0.024**	0.791	-1.950	76.796*	-0.055 *	0.357 *	0.32
	(0.955)	(0.048)	(0.841)	(0.911)	(0.000)	(0.000)	(0.000)	
UBCI	60.029*	0.004	-3.357	-31.355**	46.547 *	-0.029 *	0.402 *	0.373
	(0.008)	(0.561)	(0.276)	(0.024)	(0.000)	(0.000)	(0.000)	
BH	17.345	0.009**	2.362	-21.854**	79.958*	0.112	-0.628	-0.516
	(0.311)	(0.052)	0.333	(0.037)	(0.003)	(0.271)	(0.115)	
Amen	-5.128	0.012 ***	2.660	-5.397	27.908 *	0.4980 ***	-0.060	0.438
Bank	(0.759)	(0.063)	(0.267)	(0.595)	(0.001)	(0.074)	(0.413)	
BTE	0.5320	-4.924	-1.061	-3.1732**	6.456 *	0.000*	-0.457 **	-0.457
	(0.347)	(0.615)	(0.731)	(0.046)	(0.000)	(0.007)	(0.018)	
UIB	-8.779	0.0167*	-0.130	6.894	24.489	0.176	0.1688	0.344
	(0.498)	(0.006)	0.9432	(0.381)	(0.116)	(0.241)	(0.690)	

Note: Numbers in parentheses indicate the standard errors.

*: indicates the significance level at 1.

**: indicates the significance level at 5%.

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***: indicates the significance level at 10%.

The estimated GARCH (1, 1) parameters of the conditional return shown in table 4. We find that the coefficient y_1 ,which measures the effect of market returns on each of the bank stock return is positive in all cases except ATB, and BTE and statistically significant in the following cases STB, BH, Amen bank and UIB with a positive effect. In addition, the results indicate that the market returns has a positive impact and more or less on the bank stock returns. The market return is found to explain a greater proportion of conditional bank stock returns compared to interest rate that are negative in only 6 cases out of 10 and non-significant in all cases. Moreover, the most remarkable of the exchange rate is negative in all cases except in the following cases: BNA and UIB and statistically significant in only 5 cases out of 10. This result is confirmed with the study of Ryan, Suzanne K. & Worthington, Andrew C. (2004)" The results suggest that market risk is an important determinant of bank stock returns, along with short and medium term interest rate levels and their volatility. However, long-term interest rates and the foreign exchange rate do not appear to be significant factors in the Australian bank return generating process over the period considered".

The main rationale for the negative relationship with the exchange rate can be explained by the sharp depreciation of the exchange rate that will have an adverse of the economic effects the deterioration of net assets (liabilities denominated in foreign currency exceed assets denominated in foreign currencies) in the banks and companies. On the other hand, the depreciation of the local currency may lead to damage in the bank balance sheet and the deterioration of bank equity may result in a decline in the bank stock return, which makes exports from countries that use the currency, more competitive, means it is cheaper on the international market, however, the price of imports increases, given that money is very impaired, it is not usually a sign of economic health.

Both the ARCH parameter α_1 and the GARCH parameter β. The ARCH parameter α_1 is statistically significant in all classes of bank stock returns except BIAT, BH and UIB. In addition we note that the condition of stationary of the variance for GARCH (1, 1) parameter, namely $\alpha_1+\beta<1$ holds for all courses except BNA (8,377) bank. Changes in market volatility of each may be considered the following of a stationary process. On the other hand, the results is related to estimates of these processes indicate that the coefficients are statistically significant in 5 of 10 at 1%, the volatility persistence, measured by $\alpha_1$and β is very significant since the sum of these parameters within a range of [-0.5, 0.37] which supports a low presence of ARCH parameter and GARCH parameter effects in all cases except ATB which has 0.99 that is to say $\alpha_1+ \beta \geq 1$ has a high persistence of volatility shock. Additional, is, according to the conditional variance equation, $\alpha_0$that is positive in all cases of each bank and statistically significant in most cases; this indicates that there is a significant time-invariant component in the process of generating returns. In particular, the bank stock return sensitivities are found to be stronger for market return than interest rates, implying that market return plays an important role in determining the dynamics of the conditional bank stocks return.

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4.4. Estimation of volatility with GARCH (1, 1) model

Table 5: Volatility estimates

Banks	$\gamma(1)$	$\alpha_0(1)$	$\alpha_1(1)$	β	θ_1	θ_2
ATB	-0.361*	0.269*	-3.275*	17.401*	17.401*	-0.014*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BIAT	0.1515	-0.189	3.679	27.382**	0.257	0.1974
	(0.326)	(0.3578)	(0.230)	(0.047)	(0.327)	(0.4735)
BNA	-0.151*	0.0191*	-2.627*	193.947*	3.688*	-0.022*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Attijari bank	-0.004*	-0.024*	1.082*	48.979*	-0.101*	0.357*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
STB	0.038*	-0.058*	0.0318	8.2690*	-0.045*	0.287*
	(0.000)	(0.0000)	(0.410)	(0.000)	(0.000)	(0.000)
UBCI	-0.062*	0.027*	-0.613*	59.863*	-0.038*	0.337*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BH	0.138	0.007	-0.102	81.138*	0.109	-0.680***
	(0.3483)	(0.971)	(0.972)	(0.005)	(0.175)	(0.098)
Amen Bank	0.330*	-0.073	1.0460	30.673*	0.787*	-0.329*
	(0.000)	(0.523)	(0.538)	(0.000)	(0.006)	(0.000)
BTE	-0.080*	-0.061*	0.9680*	9.479*	0.403*	-1.057*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
UIB	0.115	-0.210	2.964	23.42**	0.322	0.056
	(0.399)	(0.208)	(0.231)	(0.052)	(0.221)	(0.875)

Note: Numbers in parentheses indicate the standard errors.

**: indicates the significance level at 1.*

***: indicates the significance level at 5%.*

****: indicates the significance level at 10%.*

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Table 5 presents the results of the bank stock and index return volatility model with the inclusion of variables is the reflecting interest rate volatility and the exchange rate volatility. We find that the coefficient α_1 of ARCH model is statistically significant in all cases except in BIAT, STB, BH, Amen Bank and UIB, over the results indicate that the ARCH parameter is small except BNA, and UIB which provides a weak support for the presence of a shock in last period of the bank stock return volatility, While the coefficient β of GARCH is wider, positive and statistically significant in all cases are indicating that solid evidence of previous surprises. Both ARCH and GARCH parameters as a measure of volatility persistence is relatively low in all cases, with the inclusion of interest rates and exchange rate volatility. Concerning the estimated coefficient θ_1, which measures the effect of interest rate volatility on the bank stock volatility are positive in all cases except Attijari bank, STB and UBCI, and statistically significant in only 8 out of 10 cases, this manifested that, when the interest rate becomes more volatile, will lead to an increase in the bank stock volatility. One possible explanation for the increase in the bank stock volatility following an increase of interest rates volatility is that banks are unable to refrain from interest rate risk, because they can not hold derivative securities that is to say, the off-balance sheet activities (swaps, and option contracts ...) is corresponding to a duration of assets and liabilities. Into account, the absence of derivatives in the financial market and the inability to implement effective techniques for risk management. This result is confirmed with studies Elyasiani and Mansur (2003) and also with Saadet Kasman, Gulin Vardar and Gokce Tunc. Concerning, the exchange rates volatility, presented by the coefficient θ_2 it is statistically significant in only out 8 of 10 cases. Lastly, in relation to the findings on the effect of exchange rate volatility on bank stock volatility, the exchange rate volatility is positive relationship with bank volatility in only 5out of 10 cases (BIAT, Attijari-bank, STB, UBCI and UIB bank). This necessarily implies that the fluctuation of the exchange rate leads to an increase of bank stock volatility. A number of potential explanations for this unexpected finding exist. First, and foremost, is that Tunisian banks simply are exposed to significant foreign exchange rate risk over the sample period. Second, while exposed to adverse fluctuations in the foreign exchange rate, tunisian banks may simply do not have adequately hedged their foreign exchange rate exposure throughout the sample period. This result is inconsistent with the results of Suzanne K. Ryan & Andrew C. Worthington who find that Australian banks are not exposed to the risk of exchange rate of the sample period, is probably negligible because the vast majority of this exposure was covered in the derivatives markets, primarily using instruments such as currency swaps and foreign exchange forward.

Generally, the interest rates volatility would information relating to the overall of financial markets volatility, and primarily reflects the uncertainty that follows the direction of monetary policy. The interest rates volatility is a determinant of banks stock volatility.

5. Conclusion

The article provides a comprehensive analysis of the simultaneous interest rate; foreign exchange rate and market risk of the Tunisian banking by employing both OLS and GARCH estimation models.

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Among the measures qualifying risk, based on the OLS, most empirical studies use this method to estimate the effect of interest rate and exchange rate fluctuations on stock returns of banks. Besides this method is used as the GARCH model, as we mentioned earlier, it has been proposed to take into account time-dependent conditional variances. However, due to the existence of residual autocorrelation in the data, the GARCH model produces more efficient coefficients than OLS.The general principle is therefore to question the ownership of homodoscedasticity we generally hold in the linear model. Measuring the outcome of conditional volatility GARCH model can capture the volatility as expected ex ante on the basis of the available information related to the past evolution of the volatility. In our work, the results suggest that market returns and exchange rate are an important determinant of bank stock returns, but the more remarkable that the interest rate has no effect of the bank stock returns. However, that long-return interest rate and exchange rate volatility are the major determinants of the conditional bank stock return volatility.

Concerning, the verification of our hypothesis we found that the exchange rate and the market index has an impact on the bank stock return, while the interest rate has no impact of the bank stock returns. Moreover, the effect of exchange rate volatility on bank stock returns volatility, the exchange rate volatility is positive relationship with bank; this necessarily implies that the fluctuation of the exchange rate leads to an increase of bank stock return volatility. While the effect of long-term interest rate volatility on the bank stock volatility is very important, when the long- term interest rate becomes more volatile, this will lead to an increase in the bank stock return volatility

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ISSN 2076-9202

TRAVELLING MADE EASY (A Case Study of redBus.in)

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ABSTRACT

redBus.in is an online travel agency offering bus tickets in India. redBus.in was founded by three engineers- Phanindra Sama, Charan Padmaraju and Sudhakar Pasupunuri -who studied together at the BITS, Pilani, and later worked in various companies in Bengaluru. Started modestly in August 2006 with a few seats from one bus operator, redBus today is one of the most successful online bus ticket booking agencies. Today, it has 700 bus operators, 10,000 buses listed on it, works in 15 states and sells around 5,000 tickets every day. The Company raised its first capital in 2007 from Seedfund Advisors, an early stage investor and their second investment in 2009 from Seedfund, Helion and Inventus Capital. Phanindra became the second entrepreneur from India to join Endeavor, a non-profit organisation started by the Harvard alumni. Business magazine Fast Company recently released its 2012 list of the World's 50 most innovative companies. One of the companies to be featured on the list is the Bangalore-based redBus. The journey of redBus has been amazing and an eye-opener to all the budding entrepreneurs. This type of business model is not present anywhere in the world. This paper attempts to explore the journey of redBus. An earnest attempt has been made to develop a case study of redBus that could be administered in management classrooms.

KEYWORDS: Business Model, Online Travel Agency, Venture Capital

ISSN 2076-9202

TRAVELLING MADE EASY (A Case Study of redBus.in)

1.1. Introduction

Bus ticket booking during the offline era posed various difficulties to the customers as well as the bus operators. Offline ticket booking reduced the scope of customers to choose different options based on their travel criterion. It also increased the franchising cost for the bus operators. At the same time, the bus operators were also finding it difficult to monitor their bus seat filling information. Many small and medium bus service organizations do not have their own online bus ticket booking system. E – Bus Ticket booking system enables those bus service organizations to cater their services online and get benefit out of it. Online bus ticketing system facilitates the customers to book their tickets of their desired bus services. The premium search engine enables customer to choose one of many buses belongs to different bus services based on their travel criterion. A unique characteristic of online ticket booking system is that it allows customers to book tickets with highly interactive features. This system will also allows the bus service organizations to monitor their booked tickets information online which reduces the human mistakes in off line bus ticket booking process, increases accuracy and enhance the flexibility of information processing. It also has a sophisticated, easy to use and good user interface which enables the customers to perform their online transactions smoothly.

1.2. redBus.in- A Kick Starter

redBus.in is an online travel agency offering bus tickets in India. redBus.in was founded by three engineers- Phanindra Sama, Charan Padmaraju and Sudhakar Pasupunuri -who studied together at the BITS, Pilani, and later worked in various companies in Bengaluru. Started modestly in August 2006 with

ISSN 2076-9202

a few seats from one bus operator, redBus today is one of the most successful online bus ticket booking agencies. Today, it has 700 bus operators, 10,000 buses listed on it, works in 15 states and sells around 5,000 tickets every day. The Company raised its first capital in 2007 from Seedfund Advisors, an early stage investor and their second investment in 2009 from Seedfund, Helion and Inventus Capital. Phanindra became the second entrepreneur from India to join Endeavor, a non-profit organisation started by the Harvard alumni. Business magazine Fast Company recently released its 2012 list of the World's 50 most innovative companies. One of the companies to be featured on the list is the Bangalore-based redBus. The journey of redBus has been amazing and an eye-opener to all the budding entrepreneurs. This type of business model is not present anywhere in the world.

2.1. Review of Literature

An attempt has been made to review case studies and the work of individual researchers, magazines, journals, articles pertaining to case methodology in teaching management concepts. A wide range of academic literature case methodology as a teaching pedagogy has been reviewed for the purpose of this study.

Philip (1996) reports the results of a study on how undergraduates in one BBA programme perceived the use of case incidents and illustrates different methodologies for using case incidents in higher education. Argues that they are a powerful, easily utilized methodology which could embrace a variety of disciplines, but even in business only a third of the teaching profession uses them regularly.

Chad Perry, (1998) states that qualitative research has not been viewed as a rigorous alternative to established quantitative methods in postgraduate marketing research. However, this paper reports on the

ISSN 2076-9202

Australian development of a successful, structured approach to using the case study methodology in postgraduate research. Its aim is to present and justify guidelines for using the case study research methodology in honours, masters and PhD research theses, and so it should interest candidates and their supervisors. First, appropriate positions on a range of scientific paradigms and core issues of induction and deduction are established. Then implementation of the case study methodology is examined, including the numbers of case studies and of interviews. Unusual but effective uses of theoretical replication to rigorously analyze case study data are illustrated from postgraduate theses. Finally, a framework is provided for constructing a thesis, emphasizing the key methodology chapter.

3.1. Need for the Study

redBus.in has a unique business model. It is the first of its kind in the world. The success story of redBus.in is very inspirational for the budding entrepreneurs. redBus.in has proved to the world that thinking out of the box would yield excellent results. It was started by people who had settled very well with their IT jobs. They quit their comfortable jobs to start redBus.in. Though they suffered from initial hiccups, redBus.in has grown in leaps and bounds within six years of its inception. This case study apart from motivating the youth to become entrepreneurs would also help them to understand the nuances of doing business in the most competitive world. This paper attempts to explore the journey of redBus. An earnest attempt has been made to develop a case study of redBus.in that could be administered in management classrooms.

4.1. Objectives of the Study

- To analyse the reasons behind the success of redBus.in

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- To formulate the success story of redBus.in as a management case study

5.1. METHODOLOGY

Information for the study was collected from both Primary and Secondary sources.

5.1.1. PRIMARY DATA was collected by interviewing the founders and the employees of redBus.in

5.1.2. SECONDARY DATA was collected from various online sources, books and journals.

5.1.3. LIMITATION OF THE STUDY

- The study is confined only to the operations of redBus.in

6.1. redBus.in-The Success Story

redBus.in was founded by three engineers-Phanindra Sama, Charan Padmaraju and Sudhakar Pasupunuri who studied together at the BITS, Pilani and later worked in various companies in Bengaluru. They neither had entrepreneurial instincts in them nor were particular about starting something on their own. All the three were comfortable with their lucrative jobs.

About five years into his job, Mr.Phanindra Sama, one of the Co-founders of redBus.in was trying to go from Bangalore to Hyderabad for Diwali. While every travel agent claimed that there were available seats on some bus, none of them could book the tickets and kept asking him to try another agent. Ultimately he was not able to go to his home town due to lack of access to the available tickets. He saw a huge business opportunity through these available but un-booked seats. His engineering instincts persuaded him to build a better system to solve the problem. His analytical skills ushered him to look at this problem as a business opportunity. He felt that computers could solve these problems easily.

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6.2. The Reason behind the Name and the Logo

The founders were impressed by the autobiography of Richard Branson who started the Virgin brand. The way he rose up from poverty fascinated them. The Virgin brand is red in colour. They felt that marketing would become easier if there is a colour. As redBus is an Internet-based company, people would have to type the name. So, they wanted to give an easy name. When they were studying in BITS Pilani, they used to go via Delhi and there, they found red line and white line buses. They first thought of naming their business as redline, but it was already booked. Hence they decided to go in for redBus. Angeline, a friend of their classmate, designed the logo for them. They registered redBus.in and created a web site for the same.

6.3. Handholding by TiE

In January, 2006, the founders of redBus with their friends divided the work and started working on weekends on the project. When the prototype was ready, they went to the bus operators and tried selling it to them, but they were not even willing to take it for free. The bus operators felt that these people were trying to disturb the status quo. The founders were perplexed and had no clues to go ahead. It was at that time TiE selected their idea as one of the three ideas out of 300 for mentoring. It was followed by venture capitalists contacting the founders as they found our idea interesting. Before they went to TiE, they did not know anything about VCs. That was the time there were many VCs and very few ideas. So, people

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were willing to put up money for the idea. TiE gave them three mentors to advise on what to do. The mentors gave the idea to start a business of our own. The mentors gave assignments to the founders on a weekly basis. It was like doing a market survey. The founders were very prompt in doing all the assignments. The founders were very much impressed about the time spent by the mentors. They collected a plethora of information about the number of buses, the number of routes, the average price of a ticket, how people buy tickets, the profile of customers, how much commission a bus operator pays to an agent, etc. It was not comprehensive, but it gave them a general idea of the industry. They started in August 2006 with Rs 5, 00, 000 which was the savings of the three founders. One room of the house where they stayed became their office. Initially the founders gave a budget of Rs.30 lakhs to the VCs and that was a big amount for them then. When they worked their budget with one of the VCS, they found that they needed Rs 3 crore to scale up the business. The agreement was that money would be invested in three years. That was in February 2007 and the money was supposed to last till February 2010. But they spent all the Rs 3 crore in one-and-a-half years. The VCs also asked them to change from an online bus ticketing company to just bus ticketing company, and that is what redBus is now.

6.4. redBus- The Journey- From First Gear to Top Gear

The founders left their comfortable corporate jobs and started redBus. From a pampered corporate life, they were thrown into a life of uncertainties where they had to go to people requesting for things. To the bus operators, they were like the hundreds of sales people who went there. The world of business is totally different from the world they saw as an employee. They faced huge challenges. They used to go to the IT companies, stand outside when the employees came out for lunch and gave their redBus cards. For

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the first time, they were on the other side of the fence. A few weeks back, they were inside a campus and they used to ignore such sales people or brush them aside. Now, they had to kill their egos. It was a big moment of truth for them. In entrepreneurial life, one would have to face such humbling experiences.

After several visits and many requests, one operator agreed to give them five seats on 18th August 2006. The bus operator gave them one week to sell the tickets. They told all their friends and colleagues and also requested one of their friends to write about redBus on their discussion board at Infosys. On the 22nd of August 2006, they sold their first seat. A lady working at Infosys booked a ticket to go to Tirupati. They were so tensed that they went to the bus station and waited till she boarded the bus. They sold all the seats in five days and went back to the bus operator. Slowly, they could add more operators to their inventory.

The first year was not a full year and they did Rs 50 lakh worth of business in the first financial year. There were no profits. During the year ending 2008 March they had turnover was Rs 5 crore . They had 25-30 people working in three offices and had 50 bus operators. In 2009, they grew six times and the turnover was Rs 30 crore. In 2010 March, they had Rs 60 crore as turnover. Today, they have around 250 people working in 10 offices. This covers all the places where the bus industry is active. Southern India is most vibrant on the Internet and then comes western India. They sell more than 5,000 tickets every day. They have 700 bus operators. redBus wants to join the Rs. 500 crore club by 2013-2014.

6.5. redBus on Cloud Platform

The cloud solution has empowered the developers to focus on building apps based on their business needs and customize for the customer. After using a traditional datacenter for over a year, redBus ran into

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scalability issues. Procuring a new server or upgrading an existing one took more than two weeks. Moreover, the limited server capacity could not effectively handle processing fluctuations, which had a negative impact on productivity. They wanted to open a port on one of their servers and it took only two days. On another occasion, the memory size was not enough to service the workload. They realized that procuring new hardware was no more an option. They found that the answer lay in a cloud solution. And that was something that was not new to redBus. redBus is much larger than its closest competitor in terms of its resource network. To capitalize on that, the company offers software, on a SaaS basis, to its bus operators. This gives them the option of handling their own ticketing and managing their own inventories. The service helps bus operators get access to a large number of customers. redBus used a cloud vendor, Amazon Web Service (AWS), to build its SaaS offering. Padmaraju, one of the co-founders observed that the entire process of hosting and managing this service was smooth and easy. So he decided to move his entire infrastructure to the cloud. Today, all redBus' applications, including the mission critical ones are on the AWS cloud. This solution includes features such as the ability to easily manage access to servers through security groups, easy-to-use self-service management console, the concept of Elastic IPs, and superior support. The cloud solution has empowered Padmaraju's developers to focus on building apps based on their business needs and customize for the customer. This was not possible in the older model where developers were spending time making changes to the apps to accommodate the traditional datacenter's limited capabilities. After moving to the cloud and hosting their infrastructure at the AWS Asia Pacific (Singapore) region, the traffic to redBus has increased 3 folds due to reduced latency. This was possible only in a cloud platform due to its elasticity and scalability. It has also given them an overall cost benefit of

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about 30 to 40 percent. redBus business no longer needs to wait because of capability limitations associated with a traditional datacenter. As soon as there is a demand, Padmaraju has the infrastructure ready to meet it. The use of cloud technology has given us the competitive edge that helps them to innovate quickly.

6.6. Revenue Model of redBus.in

redBus has three lines of business. BOSS or the Bus Operators Software System is an ERP platform that gives bus operators access to their inventory. redBus.in is the consumer facing travel booking site. And Seat Seller is a workflow system for travel agents. With BOSS, they charge a subscription fee per month while for Seat Seller they levy a transaction fee. For redBus.in, they earn a commission for each ticket booked. There is a nice network effect between these three, more operators using BOSS leading to a larger inventory available for the redBus.in consumer. Regarding the bus routes, they initially focused on few routes and tried getting one to two operators per route. That helped them to do basic targeting. Specifically at redBus, they have always been very cost conscious. They always felt that they were more of a travel agent than an e-commerce site. To keep costs down, they compromised on quality in certain areas. They did not set up the best call center or use air-conditioning. Several people doubted the ability to make money in this sector with small transaction amounts but they had managed to do that. Today, they have benefited from efficiencies of scale within their back end systems and call centers.

6.7. redBus.in Secret of Success

The common maxim in ticket booking is “More Booking-More Commission”. But the founders of redBus thought this business model was not sustainable as the agent may become a parasite on the seller. Though the whole world follows the model, they decided not to follow it. They decided irrespective of the

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volumes the commission would remain the same. This idea gave a lot of comfort to the bus operators and increased their confidence in redBus. It is an out of the box kind of business model.

redBus is constantly trying to fix customers' pain points. Customers often find that they have not been allotted the same seat they had been promised. Each bus operator has a different seat numbering system. So redBus added features such as seat layout and seat numbers. The other feature was return tickets booking. Return seats are somehow not available or very expensive.

redBus.in expanded offices wherever there was logical connect in terms of routes and where they were sure they could generate demand. Today, for example, they are selling tickets for buses plying between Kolkata and Dhaka too. Several operators run buses on the return route and want redBus to support that as well.

7.1. Conclusion

This is the journey of redBus.in. It has been fantastic so far. It was one of discovery and lot of learning. It was a journey of excitement and disappointment. The journey so far has been amazing and an eye-opener as an entrepreneur and also as a human being. Every day is a learning experience for an entrepreneur. Entrepreneurship in India is at its best. The entire community is more open to entrepreneurs and there is an incredible ecosystem that is emerging with supportive VC investors, media and events. No company can be built in isolation. The Indian domestic market is huge, just Mumbai is almost as big as the entire Malaysian market. This market offers any consumer- focused company access to a tremendous customer base that is hard to find elsewhere. A lot more impact can be derived in a vast country like India. It can also be replicated in other countries. The entrepreneurs should focus on this idea and work harder. The

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case conveys a very strong message that if you do one good job, your life is worth it. But, the important thing is, whatever you do, do it well.

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ISSN 2076-9202

FIRM SPECIFIC FACTORS AFFECTING STOCK RETURN – AN INVESTIGATION IN INDIAN CONTEXT

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ABSTRACT

The study attempts to explore the firm specific factors that contribute to variability of stock returns in Indian stock market. However from the view of the management of the firm or an investor who invests only in a few stocks, firm specific factors are important since they are very much under its control. The study uses Panel Regression using both fixed and random effects and found that firm specific attributes like valuation ratios including price to book value ratio, price to cash EPS, market capitalization to sales, debt-equity ratio, current ratio, cash profit margin, dividend and ROCE plays some role in explaining variation in stock return. The study concluded that the risk is multidimensional and that decision makers should give due consideration to firm specific factors to explain variation in returns.

1. INTRODUCTION

Identification of sources that contributes to variations of stock return is probably one of the most researched areas in financial economics. The influence may be systematic, such as economic, political or sociological changes or unsystematic. The Capital Asset Pricing Model (CAPM) uses systematic risk represented by beta as the single measure of risk. While early tests supported the CAPM, subsequent

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studies found a number of other variables that could explain expected stock returns. The apparent violations of the CAPM have spawned research into possible explanations. The explanations can broadly be divided into two categories: risk-based alternatives and non risk-based alternatives. The risk-based category includes multifactor asset pricing models which suggest that the source of deviations from the CAPM is either missing risk factors or the misidentification of the market portfolio. The empirical findings against CAPM naturally led to the empirical examination of multifactor asset pricing models motivated by the arbitrage pricing theory (APT). The basic approaches has been introduction of additional factors in the form of excess returns on traded portfolios and then reexamine the zero-intercept hypothesis. These additional factors are intended to capture common non-market risk factors.

The primary objective of this study is to identify the firm level characteristics that have a bearing on the stock return in the Indian context. The objective of shareholder wealth maximization necessitates that management strives to maximize the value of the firm, which in turn requires effective management of investor's perceived risk of an investment in a specific firm. Perceived risk of a particular investment is a function of both the firms' characteristics as also the risk emanating from the environment in which it operates. Equilibrium asset pricing models like the CAPM does not value the former because unique risk is diversifiable. These equilibrium theories view risk from the angle of a well-diversified investor, who has already diversified firm specific risk factors by selecting a diversified portfolio. However from the view of the management of the firm or an investor who invests only in a few stocks, firm specific factors are important. A firm's management has little control over the environmental factors' that affects its operation adversely, but the other set of risk factors are very much under its control because it is specific to the firm itself. While equilibrium models of return and risk are not concerned with these firm specific factors, individual firms do consider these important while pursuing the objective of shareholder wealth maximization and so does undiversified investors. The study also intends to decipher the common risk factors over the period of study for different industry groups and for firms of different size. In fact, for all the practical purposes, there is a great need for a more comprehensive study to make an attempt to chart

ISSN 2076-9202

out a clearer picture on the issue. Moreover, it is also to be noted here that there remains always a natural need to vouch and verify the existing research findings. The proposed study is also to take care of this aspect.

2. LITERATURE REVIEW

A growing number of studies found that the cross-sectional variation in average security returns cannot be explained by the market beta alone and showed that fundamental variables such as size (Banz, 1981), ratio of book-to-market value (Stattman, 1980; Chan et al. 1991) and the price to earnings ratio (Basu, 1983) account for a sizeable portion of the cross-sectional variation in expected returns. Ben-Zion & Shalit (1975) found size and leverage to be significant. Sharpe and Sosin (1976) have discussed that the group with lowest dividend yield had highest average excess return and also highest beta. Reinganum (1981) found that size and P/E ratios could explain variations in returns. Bhandari (1988) finds that high debt-equity ratios (book value of debt over the market value of equity, a measure of leverage) are associated with returns that are too high relative to their market betas. Fama and French (1992, 1993) synthesized the evidence of the empirical failures of the CAPM and proposed a three- factor model for expected returns using cross-sectional regressions. They confirm that the two non-market risk factors SMB (the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks) and HML (the difference between the return on a portfolio of high-book-to-market value stocks and the return on a portfolio of low-book-to-market value stocks) are useful factors when explaining a cross-section of equity returns. Among practitioners, the three-factor model is offered as an alternative to the CAPM for estimating the cost of equity capital. However Jegadeesh and Titman (1993) showed that the serious problem with three-factor model is the momentum effect of stocks, which is left unexplained by the three-factor model, as well as by the CAPM. Davis (1994) and Davis, Fama and French (2000) confirmed the influence of book to market ratio and size over various time periods from 1929-1997. Lakonishok et al. (1994) in their study have shown that the ratios with accounting numbers such as sales per share and cash flow can also be used to predict returns. Jagannathan and Wang (1996)

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found no size effect after inclusion of human capital in wealth and allowing betas to vary over the business cycles. They also showed that their model performs as well as the three factor model of Fama and French (1993). These studies were conducted in the American stock market. Carhart (1997) added a momentum factor (the difference between the returns on diversified portfolios of short-term winners and losers) to the three- factor model to study the mutual fund performance. But since the momentum effect is short- lived, it is largely irrelevant for estimates of the cost of equity capital. More recently, Singh (2009) used panel data analysis and suggested that size, earnings yield, cash earnings yield, dividend yield, and book-to-market ratio explains variation crosssection of returns in Indian context.

3. OBJECTIVE

The study aims to investigate the determinants of common firm specific factors that have a bearing on stock returns in Indian context.

4. DATA

Data for the study are obtained from Company Annual Reports, Capitaline Plus database and NSE publications. The time period of study is April 2005 to March 2011 for firm attributes but firm stock returns are from July 2005 to June 2011. This was done to ensure that previous year's annual report was available prior to calculation of returns.

5. METHODOLOGY

For this purpose 11 variables were initially selected that are expected to affect stock returns

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irrespective of industries they belong and have been used in previous studies across the globe. The variables include Price to Earnings Ratio (PE); Price to Book Value Ratio (PB); Price to Cash EPS Ratio (P/CEPS); Enterprise Value to Earnings before Interest, Depreciation, Tax and Amortization Ratio (EV/EBIDTA); Market Capitalization to Sales Ratio (M/S); Debt-Equity Ratio (D/E); Current Ratio (CR); Cash Profit Margin (CPM); Dividend (Div); Return on Capital Employed (ROCE); and Profit before Interest Tax Margin (PBITM).

All companies in S&PCNX500 list as on 31.03.2011 were initially considered. The firms were eliminated if firm specific data points were missing or they were not traded for more than three months between the periods April 2005 to July 2011. Banking and other financial Institution stocks were also not considered due to the different nature of their balance sheet. We had 335 companies list for 6 years and have used panel regression to explore if they are important to explain the returns on firms. The regression equations are explained as under:

First, 6 cross-sectional regressions with the explanatory variables are run for each of the 6 years with the aim to find out the significant variables in each of the years and if the significant variables changes in between years. This is followed by the panel regression (both random effect and fixed effect models) that takes into consideration both aspects of crossectional and time series data.

After running regression for 6 years, the data is organized into stacked cross sections where each block of cross sectional data is stacked on top of itself over time. The general pooled model specification is expressed as: $y_{i,t} = X_{i,t}\beta + u_{i,t}$ where $y_{i,t}$ is the observation on the dependent variable for cross-sectional unit i in period t, $X_{i,t}$ is a 1茎 vector of independent variables observed for unit i in

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period t, β is a $k \times 1$ vector of parameters, and $u_{i,t}$ is an error term. Under the error component specification, the disturbance term takes the form $u_{i,t} = \alpha_i + \varepsilon_{i,t}$ where α_i's are company specific and time invariant component and $\varepsilon_{i,t}$'s are remainder effects with standard properties (zero mean, no serial correlation or heteroskedasticity, zero correlation with X and with α). There are basically two types of panel models, the fixed effects and the random effects model. They differ by their assumptions regarding how the heterogeneity is captured and in estimation techniques. Fixed effect models are estimated using Ordinary Least Squares method but random effect models are estimated using Generalized least squares (GLS) method. The α_i under error component specification captures the individual or company specific effect and is assumed to be fixed in the fixed effects model. For the random effects model it is stochastic and distributed. In other words individual effects are not correlated with the error-term but with the regressors in the fixed effects model (vice versa in the random effects model).

Random effect regression is run using GLS method. With estimation of random effects regression, following two tests are considered:

(a) The Breusch–Pagan test (Chi-square test) where the null hypothesis is that the variance of the unit-specific error i.e., variance across entities equals zero. If this hypothesis is not rejected then it may be concluded that individual firm differences are not random.

(b) The Hausman test (Chi-square test) hypothesises the consistency of the random effect estimates against the alternative that only the fixed effect model is consistent. Rejection of null hypothesis suggests that the random effects estimator is not efficient and the fixed-effects model is preferable. Estimation of fixed effect models often involves a dummy variable for each cross-sectional unit

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which is called the Least Squares Dummy Variables (LSDV) method. Alternative approach is to subtract the group mean from each of variables and estimate a model with or without a constant. For the study, the group mean ($\bar{y}_i$) from each of variables is subtracted and the dependent variable is written as $\tilde{y}_{i,t} = y_{i,t} - \bar{y}_i$ where group mean is defined as $\bar{y}_i = \frac{1}{T_i}\sum_{t=1}^{t=T} y_{i,t}$ when T_i is the number of observations for unit i. An exactly analogous formulation applies to the independent variables. Parameter estimates, β_i is obtained using such de-meaned data using the equation $\tilde{y}_{i,t} = (y_{i,t} - \bar{y}_i) = \alpha_i + \beta_i(X_{i,t} - \bar{X}_i) + (\varepsilon_{i,t} - \bar{\varepsilon}_i)$. After estimating the model using fixed effects, F-test is done for the null hypothesis that the cross-sectional units all have a common intercept, i.e., to say all α_i are equal. Rejection of null hypothesis suggests that adequacy of fixed effect model over the pooled least square model. Fixed effect regressions have been run with and without time series dummies to check the effect of time variable on the model followed by Wald test for joint significance of time dummies.

6. FINDINGS

6.1 CORRELATION ANALYSIS

The correlation between average values of firm specific attributes and average stock returns are displayed in Table 1. The average was taken over a period of 6 years.

Table 1: Correlation Matrix - Firm Specific Attributes and Stock Returns

	PE	PB	P/	EV/EB	M/S	D/E	CR	CPM	ROCE	PBITM	DIV	RET
PE	1	0.15	0.279	0.3017	0.21	0.05	-0.01	-0.03	-0.1006	-0.0325	-0.15	0.087
PB		1	0.157	0.2269	0.35	-0.02	-0.02	0.101	0.4044	0.0836	-0.16	0.182

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P/CE			1	0.4204	0.19	-0.05	0.006	0.041	0.0073	0.032	-0.10	0.133
EV/E				1	0.20	-0.01	-0.01	-0.04	-0.0698	-0.0362	-0.26	0.111
M/S					1	-0.08	0.077	0.462	0.0689	0.3886	-0.17	0.133
D/E						1	0.41	-0.07	-0.1003	0.2558	-0.06	-0.02
CR							1	0.191	-0.0282	0.3291	0.03	-0.01
CPM								1	0.2167	0.8017	0.08	0.059
ROC									1	0.162	0.12	0.125
PBIT										1	0.09	0.031
DIV											1	-0.18
RET												1

6.2 REGRESSION RESULTS

The regression results showing significant variables explaining crossection of stock returns across 6 years are displayed in Table 2. The findings are for each of the 6 years from 2005-06 to 2010-11. Then the result of a panel regression with all the selected variables is tabulated in Table 3 and Table 5. The R square values as shown in Table 2 and Table 5 are far from satisfactory. This was followed up with another panel regression with time dummies and the selected variables as displayed in Table 6.

Table 2: Regression between Stock Returns and Firm Specific Attributes

(Year wise)

Year	Significant variables	R square	DW
2005-06	PB, P/CEPS, EV/EBIDTA, Div	0.25	2.01
2006-07	PB, CPM, ROCE	0.21	1.87

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2007-08	P/CEPS, D/E, PBITM, ROCE, M/S	0.18	1.73
2008-09	ROCE, M/S, D/E	0.18	2.09
2009-10	PB, ROCE, D/E	0.05	2.09
2010-11	PB, P/CEPS, ROCE, M/S	0.14	2.10

The findings from the cross sectional regressions show that ROCE is significant in explaining return in all the years except 2005-2006. PB is significant in the period 2005-2007 and 2009-2011. D/E ratio is significant during the recession hit period 2007-2010 while P/CEPS is significant in 2005-2006, 2007-2008 and 2010-2011. M/S is significant in 2007-2009 and 2010-2011. While EV/EBIDTA and Div are significant in 2005-2006, PBITM is significant in the year 2007-2008. Therefore cross sectional regression analysis gives a mixed picture and to improve the precision, panel regression model is used.

Table 3: Estimated coefficients from Panel Regression (Random Effect)

Regression Type	**Explanatory Variables**	**Coefficient**	**Std. Error**	**t-ratio**	**p-value**
Random-effects (GLS), Included 335 cross-sectional units	Constant	1.47705	3.7641	0.3924	0.69481
	PB	1.24294	0.3549	3.5016	0.00047
	P/CEPS	0.16733	0.0373	4.4767	<0.00001
	EV/EBIDTA	-0.02702	0.1318	-0.2050	0.83761
	M/S	0.65949	0.4821	1.3679	0.17150
	D/E	1.09035	1.1079	0.9841	0.32518
	CR	0.16208	0.4759	0.3406	0.73345

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Time-series length = 6 Dependent variable: return	CPM	0.37516	0.1832	2.0478	0.04071
	PBITM	-0.19366	0.1314	-1.4737	0.14073
	Div	-5.39973	0.8198	-6.5863	<0.00001
	ROCE	0.26196	0.1019	2.5696	0.01025
Breusch-Pagan test - Null hypothesis: Variance of the unit-specific error = 0 Chi-square(1) = 50.2813 (p-value = 1.33215e-012) **Hausman test** - Null hypothesis: GLS estimates are consistent Chi-square(10) = 128.118 (p-value = 1.13016e-022)					

The rejection of the null hypothesis under Breusch-Pagan test indicates that the effects are random and ordinary pooled least square model is inadequate to capture such random effects. However the null hypothesis that GLS estimates are consistent under Hausman test is also rejected indicating random effect may be correlated with the regressors. This suggests that the fixed effect model may be considered to obtain consistent parameter estimates.

Before applying for fixed effects, Variance inflation factors were examined to explore the presence of multi collinearity if any. The Variance inflation factor (VIF) is calculated as

$VIF(j) = 1/(1 - R(j)^2)$, where R(j) is the multiple correlation coefficient between variable j and the other independent variables. The minimum possible value = 1.0 and values > 10.0 may indicate a collinearity problem. The Variance inflation factor (VIF) is calculated and displayed in Table 4.

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Table 4: Variance Inflation Factors (VIF)

Firm Specific Factors	**VIF**
PB	1.677
P/CEPS	1.287
EV/EBIDTA	1.731
M/S	1.970
D/E	1.696
CR	1.396
CPM	3.817
PBITM	4.171
Div	1.143
ROCE	1.625

Variance Inflation Factors (VIF) are all within a satisfactory level (all are under five) suggesting that there is no significant multi collinearity problem in the data.

Table 5: Estimated coefficients from Panel Regression (Fixed Effect)

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Regression Type	Explanatory Variables	Coefficients	Std errors	t value	p value	
Fixed-effects, Included 335 cross-sectional units Time-series length = 6 Dependent variable: return	Constant	2.9679	6.6888	0.443	0.65731	R^2 =0.18
	PB	1.7278	0.4270	4.045	0.00005	
	P/CEPS	0.1895	0.0424	4.468	<0.00001	F = 1.19 (p value=0.016)
	EV/EBIDTA	0.1432	0.1622	0.883	0.37722	
	M/S	2.4875	0.6824	3.644	0.00028	
	D/E	2.9660	1.8356	1.615	0.10632	
	CR	-1.9815	1.4814	-1.33	0.18119	DW=2.31
	CPM	0.6382	0.2748	2.321	0.02036	
	PBITM	-0.1505	0.2206	-0.68	0.49529	
	Div	-11.8051	1.2112	-9.74	<0.00001	
	ROCE	0.2381	0.1850	1.287	0.19820	
	Test for differing group intercepts - Null hypothesis: The groups have a common intercept Test statistic: F(334, 1666) = 0.668775 with p-value = P(F(334, 1666) > 0.668775) = 0.999997					

Table 6: Estimated coefficients from Panel Regression with Time Dummies

Regression Type	Explanatory Variables	Coefficients	Std errors	t value	p value	
Fixed-effects, Included 335 cross-sectional	Constant	37.3124	4.76856	7.8247	<0.00001	R^2=0.67
	PB	1.030	0.27461	3.7523	0.00018	
	P/CEPS	0.144	0.02697	5.3753	<0.00001	
	EV/EBIDTA	-0.116	0.10350	-1.1245	0.26097	F Value =
	M/S	1.187	0.43659	2.7196	0.00660	

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units, time	D/E	2.335	1.16601	2.0029	0.04535	9.75
	CR	-1.602	0.94279	-1.6996	0.08939	
dummies	CPM	0.381	0.17536	2.1780	0.02955	
Time-series	PBITM	-0.103	0.14094	-0.7350	0.46245	
	Div	-2.388	0.81119	-2.9446	0.00328	DW=2.14
length = 6	ROCE	0.393	0.11881	3.3127	0.00094	
Dependent	dt_2	-61.496	3.19326	-19.258	<0.00001	
	dt_3	-69.402	3.21126	-21.612	<0.00001	
variable:	dt_4	-112.682	3.48238	-32.35	<0.00001	
return	dt_5	33.902	3.23065	10.4941	<0.00001	
	dt_6	-48.823	3.24294	-15.06	<0.00001	

Test for differing group intercepts -

Null hypothesis: The groups have a common intercept

Test statistic: F value = 9.28493 with p-value = 2.7481e-218

Wald test for joint significance of time dummies

Asymptotic test statistic: Chi-square = 2472.36 with p-value = 0.00

Fixed model allows for intercept to vary across the groups. However, the value of F statistic obtained in fixed effect model without time dummies (Table 5) fails to reject the hypothesis of common intercept across groups. As such, the adequacy of the fixed effect model cannot be established. Also the R square value is far from being satisfactory. To improve the findings fixed effect model with time dummies were estimated. The F statistic obtained (Table 6) rejects the null hypothesis of common intercept across groups, which is suggestive of the validity of the use of fixed effect model with time dummy. The Wald test indicates that time dummies were jointly significant in explaining the return. Also R square value improved suggesting that use of time dummy in fixed model explains the return series better.

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7. Conclusion

Empirical study of firm specific factors found factors including price to book value ratio, price to cash EPS, market capitalization to sales, debt-equity ratio, current ratio, cash profit margin, dividend and ROCE are significant in explaining the cross-section of returns. Apart from above, the validity of the fixed effect model suggests that stock returns may be influenced by some time invariant properties which are specific to each firm like firm specific style of functioning, management policies and efficiency, etc.. Contrary to the findings of many earlier studies, PE ratio was not significant for determination of return in the presence of other factors and hence has been excluded from regression models to improve the power of the model. D/E ratio was found to be significant during 2007-08 to 2009-10. Since the subprime crisis started in 2007-08 and the entire period of 2007-08 to 2009-10 was a period of recovery, this clearly indicates investors' faith on fundamentalist approach to stock investing. Information related to strength of capital structure is disclosed by D/E ratio and investors considered it important during the time of crisis.

The findings possibly indicate the multidimensional nature of risk and suggests firm specific attributes like valuation ratios, debt equity ratio, liquidity ratio, dividend yield, cash profit and ROCE plays some role in explaining variation in stock return. The above findings may be viewed with caution since results may vary depending on the sample, time period and estimation methods used. We can only suggest that decision makers should give due consideration to firm specific factors and not rely solely on systematic factors to explain variation in returns.

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ISSN 2076-9202

Examining Work Engagement as a Precursor to Turnover Intentions of Service Employees

(Keywords: Work engagement, esprit de corps, Turnover Intentions, India)

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Type of manuscript: Research Article

Abstract

The researchers in past have long established the relevance of employee work engagement and their desired organizational outcomes all over the world. Little or no such research has focused on understanding the linkage between work engagement and employee turnover intention particularly in a developing country like India. The present study, conducted in Indian service sector match service employee perception about several forms of work engagement (vigour, dedication and absorption) with esprit de corps and their turnover intentions. The study revealed that engagement exerts its direct positive impact on service employees' esprit de corps and negative impact on their turnover intentions. Using path analysis, the empirical results also indicated indirect impact of employee work engagement on their turnover intention via the employee esprit de corps, thus, highlighting the role of employee esprit de corps as effective intermediating variable in the causal relationships.

(Keywords: Work engagement, esprit de corps, Turnover Intentions, India)

ISSN 2076-9202

Introduction

Turnover intention refers to chance of leaving the current organization permanently by an employee in near future where as turnover is when an employee actually resigns from an organization permanently (Vandenberg and Nelson, 1999). In the series of withdrawal cognition- stages that finally lead to actual turnover, research has confirmed that intent to leave is the most immediate preceding stage of actual turnover (Tett and Meyer, 1993; Griffeth *et al*. (2000).

Turnover intentions has been one of the major concerns for business practitioners and research scholars for it leads to number of negative consequences like hiring and training costs, loss of productivity and disruption to work flow (Firth *et al.,* 2004), cost on account of lost sales and management's time (Catherine, 2002) and low morale among existing staff who feel overworked as a reason of turnover (Hendrie, 2004).Although, much research work has been done around the turnover related issues, however, not much has been done around the area reflecting as to why employee intend to leave (Lee and Mitchell, 1994; Morrell *et al.,* 2004).

Employee intent to leave is not only one of the influential drivers of actual turnover, but also the last proceeding cognitive stage of an employee turnover. Therefore, it is worthwhile on the part of research scholars and practitioners to understand causes of turnover intentions and explore ways to check this undesired employee attitude. There can be several causes of employee intention to leave, yet the focus of the present study is to examine the employee work engagement in service organisation as an antecedent to employee turnover intentions.

Work Engagement

The study of Kahn (1990) is recognized as a pioneering work on work engagement. Kahn in this study argued that engaged people remain psychologically present, do entirely express themselves physically, cognitively, and emotionally at their work places. This kind of attitude is called as "*self-in-role*." in his work and is considered significant to make employees feel attentive, connected, integrated, and focused at their job places (Kahn, 1992). Saks (2006, p. 602) defined work engagement as "a distinct and unique

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construct consisting of cognitive, emotional, and behavioral components . . . associated with individual role performance". It is inclusive of long-term emotional involvement and positively influences job attitudes like job satisfaction and commitment (Wagner and Harter, 2006), generates enthusiasm and feeling of connection to their organization, (Buckingham and Coffman, 1999), and improves productivity (Meere, 2005). Macey *et al.* (2009) define engagement as a "psychic kick of immersion, striving, absorption, focus and involvement."

The most commonly accepted definition of work engagement is given by Schaufeli *et al*. (2002) as "a positive, fulfilling, work-related state of mind characterized by vigour, dedication, and absorption." In this study, '*vigour'* refers where a worker feels energetic, willingly invests effort in one's work and maintains persistence despite difficulties. **'***Dedication'* refers where a worker experiences enthusiasm as a reason of sensing his work purposeful, challenging and inspiring. *Finally*, *'absorption'* is characterized as being deeply engrossed in one's role so much so that one's time passes quickly and one does not feel like withdrawing from work.

Kahn (1990, 1992) pointed towards three main drivers of workers engagement. *First*, the sense of meaning as perceived by the workers in their work role. *Second*, how far psychologically, a worker is sure that his or her performance will not lead to any undesired reward. *Finally*, the availability and accessibility to the sources as needed by the worker for performing one's role. Both the accessibility and availability of resources play a significant role in one's being engaged or otherwise (May, *et al*., 2004; Rich *et al.,* 2010).

Research to date suggests that organizations with high levels of work engagement report various desired organizational outcomes (Kular *et al*., 2008;Bakker *et al.,* 2011).Specifically it positively influences employee productivity and financial returns(Richman, 2006) job performance (Halbesleben and Wheeler, 2008;Bakker and Bal, 2010), organisational citizenship behaviour or extra role behaviours (Schaufeli and Bakker, 2004;Saks,2006), job satisfaction(Richman, 2006)customer satisfaction (Salanova *et al*., 2005; Richman, 2006), business returns (Richman, 2006;Xanthopoulou *et al.,* 2009), organizational commitment (Schaufeli and Bakker, 2004), and better health and consequent work performance

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(Sonnentag, 2003).Several studies have also reported negative relationship between work engagement and turnover intentions(*e.g*., Schaufeli and Bakker, 2004; Hakanen, *et al.*, 2006; Lloyd, 2008).

Justification of the Study

Given the literature, most of that what has been written about work engagement has come either from practitioner literature or consulting firms and very little is reported in the academic literature (Robinson *et al.,* 2004).In order to plug the gap, the present study is conducted in Indian service sector where the concept of work engagement and its linkages with turn over intention has almost remained unexplored to the best of author's knowledge.

In view of the fact that MNCs are opening its business units in India at an increasing rate than ever before, both in product as well as services sector. Pertinently, the Indian service sector in particular has witnessed noticeable growth in recent past. Countless MNC's approach potential candidates with exciting and interesting jobs simultaneously, thus making employee retention a challenging task for Indian corporate. Here lies the justification for this study that aims at diffusing the understanding of the concept of work engagement and highlights as to how it can help service managers deal their turnover related issues.

Research in past has established linkage between employee work engagement and employee turnover through various intermediating employee job attitudinal responses like job satisfaction, commitment *etc*. However, an indirect impact of employee works engagement, mediated by employee outcome like "*esprit de corps*" is assessed for the first time in the turnover literature. Pertinently, the significance of employee *esprit de corps* and its impact on employee turnover intentions has almost remained unexplored in turnover literature even relatively in the west.

Work engagement and Turnover Intentions: Linkages

Engaged workers are generally satisfied, enthusiastic and energetic in their work environment. Once a worker experience decline in these positive feelings, it is logical that he or she will look

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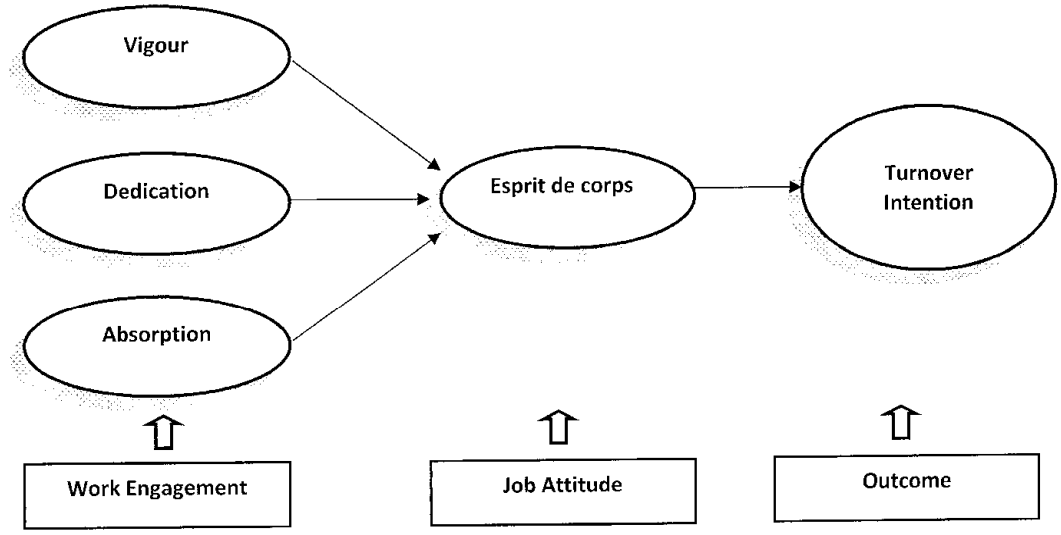

Figure: 1: Impact of Work engagement on turnover intention via employee job attitude

for alternative work environment to restore the same level of positive experience and may quit the present job. Kahn (1990; 1992) argues that engaged workers invest their self in their work roles. In view of the considerable investment of energy in the present job, engaged workers are less likely to think about other jobs or organisations (Halbesleben and wheeler, 2008). This sounds more logical because quitting the present job may result into loss of resources those might have been attained and accumulated by the worker in the present job environment (De Lange *et al.,* 2008).

Drawing on the COR (*Conservation of Resources Theory)* workers obtain, accumulate, retain, and care for those things that they value most ((Hobfoll, 1989). In organisational context, these things refer to worker's job resources like better autonomy, social relationships, supervisors support and feedback about their performance that help them perform better. Workers have to be adaptive to improve their chances of obtaining these job resources. To put it other way engaged workers can be more adaptive and consequently can improve their job resources. Conversely, less engaged workers are unable to improve their resources and as a reason of constrained for want of adequate resources tend to quit the present job.

Thus, in view of the above arguments the present study proposes following hypothesis:

H1 Greater the level of work engagement, lower the turnover intentions.

Work engagement and *esprit de corps*: Linkages

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Engaged workers invest their self in their roles known as "*self-in-role*." This is considered pivotal to make employees feel attentive, connected, integrated, and focused at their job places (Kahn, 1992).Again work engagement is referred as long-term emotional involvement which in turn influences workers' commitment and generates enthusiasm and feeling of connection to their organization(Buckingham and Coffman, 1999;Wagner and Harter, 2006).This kind of environment is similar to that of organisations with *esprit de corps* which also reflect a deeper sense of connectedness , mutual support, freedom of expression and genuine caring for each other within the work group. Thus work engagement is expected to be related to *esprit de corps* thus clarifying the basis for the following hypothesis:

H2 Employee work engagement is positively related to employee esprit de corps.

Where ever, antecedents can be assumed to be predictor of some dependent variable which in turn is itself predictor of some other outcome variable, there is scope of testing mediation. Further in the present model of causal relationship, work engagement is not only predicting *esprit de corps* but also the turnover intentions. Thus, it is also reasonable to assume following:

H3 employee esprit de corps will mediate the relationship between employee work engagement and their turnover intentions.

Methodology

Investigations were carried out to ascertain the relationships between employees perceived work engagement, *esprit de corps* and employee turnover intentions.

The details of the methodology are presented as follows:

***Data collection and the sample*:** The primary data was collected from several branches of four (4) prestigious banks in India (SBI, PNB, J & K bank Ltd and Standard Chartered Bank.), operating in the states of Delhi, Punjab and Jammu and Kashmir. The proportionate stratified sampling procedure was followed to consider all the possible categories like rural, semi rural, urban, and metropolitan in the sample. The employees were given questionnaire to capture the notion about their engagement level, *esprit de corps* and their turnover intention in near future. Out of 350, as many as 206 completed and

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usable questionnaires completed by employees were received resulting into a response rate of 59 percent.

The Scale Purification: Lickert's 5- point scale was used throughout the study to measure respondents' reaction to each item, ranging from strongly disagree (1) to strongly agree (5). Items of various scales were deleted during the preliminary scale purification processes that include item-scale correlations and exploratory factor analysis. Items were also deleted if the factor loading was less than 0.40 or cross loaded. After deletions, all scale items were statistically significant and all scales showed unidimensionality in terms of model fit indices and face validity.

The dimensions of work engagement like 'vigour', 'dedication', and 'absorption' were measured by seventeen-item Utrecht Work Engagement Scale (UWES) originally developed by Schaufeli *et al.* (2002).The factor loadings of its components were statistically significant and their standardized estimate ranged from 0.48 to 0.86. Four-item scale of Seashore *et al.,* 1982 was found appropriate for measuring the employee turnover intention. Finally, '*esprit de corps'* was measured with the six item scale adopted by Jaworski and Kohli (1993). However, one item was deleted as their factor loading was less than 0.40.Therefore, only five (5) items were retained for analysis after scale purification process that provided for a unidimensional scale (x^2 = 19.07, df = 5, p = 0.02, RMR = 0.02, GFI = 0.88, AGFI = 0.96, CFI = 0.94).

Analysis and Results

Using LISREL, 8.7, the present analysis identified causal pattern of several variables as considered in this study. The author estimated a measurement model prior to examining the relationships through the path coefficients. Table 1 shows the measurement model that provides a reasonable fit to the data. Whereas the x^2 value is statistically significant (x^2 = 841.1, df = 348, p < .05, RMR = 0:044, GFI = 0:79, AGFI =0:75, CFI = 0:91), the goodness-of- fit index (GFI) and the adjusted goodness-of-fit index (AGFI) were 0.78 and 0.77 respectively. The CFI showed a high value of 0.91.

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Table 1- Statistics indicating Inter-Item Correlations and Alpha Values

Scale	*Mean*	*SD*	*1*	*2*	*3*	*4*	*5*
1.Esprit de corps	3.20	0.694					
2.Vigour	3.05	0.727	0.37*				
3.Dedication	3.91	0.714	0.13	0.23*			
4.Absorption	2.86	0.520	0.15*	0.11*	0.26*		
Cronbatch alpha			0.69	0.69	0.67	0.47	0.74

Notes: Goodness-of-fit statistics x2 = 841.1, df = 348, p < .05, RMR = 0:044, GFI = 0:79, AGFI =0:75, CFI = 0:91)

Thus slightly low Cronbatch alpha value in a few constructs is not considered to be a problem with analysis. Further, generally the alpha- estimates are nearer the cut off point (0.70).The Factor loadings (ranging from 0.47 to 0.73) of the constituent items are also satisfactory.

The Impact of Work engagement on Esprit de corps: The estimated R^2 in Table 2 suggest that a variation of 38 percent in employee *esprit de corps* is explained by various elements of work engagement. Specifically, greater the employee vigour, greater the employee *esprit de corps* (b = 0. 14, *p* <.001).Absorption is the most influential (b = 0. 42, *p* <0.001) on the *esprit de corps*. However dedication does not appear to be driver of the *esprit de corps* that should be taken with care unless sufficient replications are available. Taken together, the statistics in Table 2 supports the H2 that employee work engagement is positively related to employee *esprit de corps*. Additionally, direct path indicates a significant negative relationship (b = 0. -38, *p* <0.001) between *esprit de corps* and turn over intentions

The Direct and Indirect Impact of Work Engagement on Turnover Intentions

Examining the significant total causal effects of the various variables on turnover intentions, both direct and indirect effects are ascertained (See Table 3)

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Table 2: Path coefficients, indicating Impact of Work engagement on Employee Perceived *Esprit de corps*

Dimensions of Work engagement ***(Independent variables)***		Esprit de corps (***Dependent Variables***)
	1. Vigour	0.14 ***
	2. Dedication	0.59 ns
	3. Absorption	0.42*
	R^2	*0.38*

*Note * <.001 ;**< .01;*** <.05; and ns = not significant*

Direct impact*:* The statistics in Table 3 reveal that dedication is one of the most powerful elements of work engagement that exerts its direct effect on turnover intention (b = -0.348, *p* <.01), followed by vigour (b = -0.189, *p* <.01). Absorption appears to be marginally influencing the turnover intention (b = -0.076, *p* <.05).

Indirect impact*:* The results have revealed several indirect relationships as well. Both vigour and absorption more or less influence equally the outcome variable *i.e.*, turnover intention (b = -0.159, *p* <.05and b = -0.147 *p* <.01 respectively).However, dedication marginally influences the turnover intentions. Thus, considering the overall direct as well as indirect effects of work engagement on turnover intentions, there is ample evidence in support of *H1* that greater the level of work engagement, lower the turnover intentions.

Mediating impact: One important observation from the above results is that excepting with that of dedication, all other elements of work engagement exerts significant and substantial indirect effects on turnover intention. This suggests a considerable mediation of intermediating variables excepting with that

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of dedication variable. Taken together the significant indirect effects, it is safe to accept *H3* that employee *esprit de corps* mediates the relationship of work engagement and turnover intentions.

Table 3- Direct, Indirect and Total Impact of Dimensions of Work Engagement on Turnover Intentions in decomposed form.

Dimensions of Work Engagement	**Turnover Intentions**		
	Direct impact	*Indirect impact*	*Total impact*
1. Vigour	-0.189*	-0.147*	-0.336*
2. Dedication	-0.348*	- 0.058**	-0.406*
3. Absorption	-0.076**	-0.159**	-0.235**

*Note: * significant at p <.01; ** significant at p < .05*

Discussion, Conclusion and implications

The present study focused on empirical examination of the hypotheses about several positive effects of work engagement dimensions on employee turnover intentions in Indian services context. It is found that the three dimensions of work engagement exerted its direct impact positively on *esprit de corps* as well as on employee turnover intentions. The empirical results also report several indirect effects of work engagement on employee turnover intentions via the employee *esprit de corps*. These direct as well as indirect linkages of work engagement highlight the relevance of engagement to desired employee attitudes, performance and specifically to employee turnover intentions.

The organisations need to monitor the engagement levels of their employees and continuously find ways to improve their *esprit de corps.* The organisations would benefit from understanding and measuring each dimension of work engagement. In fact they can decide about bench marks and monitor how well their employees at individual, division or business unit level are performing. This in turn can become the basis for decisions related to reward system. All this is expected to reduce intention to quit, actual turnover and

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consequent cost in terms of the cost and effort involved in the recruitment, induction and training of replacement staff.

The basic premises of work engagement can be strengthened through management intervention. *Specifically,* management needs to ensure that employees are involved in meaningful work that matches their aspirations, experience and interests. The employees should feel safe that their efforts may not lead them to experience any negative reward and finally all required resources must be made available and accessible to them for their smooth performance. In order to encourage work engagement culture in organisations, treating people fairly, building environment of trust in management and in immediate supervisors, rewarding managers for creating effective engagement culture and providing employee with adequate autonomy and feedback are some of the common measures suggested by several engagement scholars (e.g., Macey *et al.,* 2009).

Limitations and Future Research Agenda

As with any other research, this study also has some principal limitations that need to be addressed in future research works.

Using longitudinal study, scholars in future can examine impact of work engagement on actual turnover instead of their turnover intentions. However, using turnover intention instead of actual turnover in this study is justified in as much as the intent to leave is reported to be highly correlated with actual turnover.

Employee *esprit de corps* was the single job attitude intermediating variable considered in this study. Using other employee job attitudinal responses like job embeddedness, service effort, job involvement, job satisfaction, motivation, and commitment as intermediating variable between work engagement and turnover intentions seems to be immediate research requirement. Similarly, instead of considering turnover intentions the only outcome variable, scholars can consider other desired organizational desired outcome like profitability, ROI, corporate image, customer retention and loyalty in banking and other service sectors.

The results of the present study cannot be generalized unless replication studies are carried out in other

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service sectors. Further, examining influence of various work engagement forms on turnover behaviour across sectors, cultures may help ascertain its relative impact across these sectors, cultures to enable practitioners to prioritize their focus in accordance to culture or sector specific findings**.**

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ISSN 2076-9202

Relationshipbetween cultural Factors and Knowledge Management Effectiveness, Case Study: Iranian Government Organizations

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Abstract

The purpose of this study to examines the relationship between cultural factors and knowledge management effectiveness in Iranian government organizations. The sample has been selected in the 92 executives in county and municipal government organizations in Iran. Particularly, this study examined municipal government and county employees working in 30 different county departments with the 10 highest populations in Iran. The results of hypothesis test showed that there are no relationship between cultural factors and knowledge management effectiveness.

1- Introduction

KM refers to management's conscientious efforts to use tools and approaches to locate, refine, transfer, and apply the knowledge and experience available to the company (von Krogh, 1998). Generally, KM refers to the overall effort to manage knowledge within an organization. In contrast, a KM system (KMS) is the information technology component of a KM program (Alavi and Leidner, 2001). The technology is extremely important to KM through the capabilities it provides in the form of communications, collaboration, and the storage of vast amount of data, information, and knowledge. While technology is certainly a critical enabler of KM programs (Alavi et al., 2000; O'Dell and Grayson, 1998), climate (Bock et al., 2005), culture, and structure (Gold et al., 2001) are also important aspects of KM. In a similar view, KM is a deeply social process that must take into account human and social factors (Mason and Pauleen,

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2003). Theoretical research focuses on the universal aspects of a problem as opposed to its particulars (McGrath, 1982).

Frameworks are especially useful in better understanding the universal in a discipline and help guide the work of researchers (Palvia et al., 2003). One framework examines the effects of incentive alignment on users and organizational effectiveness in the contexts of decision support systems, KM, and supply chain coordination (Ba, Stallaert and Whinston, 2001). The relationship between strategy, structure, people, and technology with individuals, groups, and organizations as key elements in the KM process is the basis for another framework (Grover and Davenport, 2001). Another framework suggests that more research is needed on how informal networks (networks of people, rather than technology) affect knowledge transfer and whether or not some organizational structures are more effective than others (Argote et al., 2003). Argote, 2003 used KM outcomes in the forms of creation, retention, and transfer versus KM context in the form of properties of units, knowledge, and relationships between units to better understand the current state of KM research. In one of the most frequently cited articles in KM (Jennex and Croasdell, 2005), Alavi and Leidner (2001) describe knowledge processes in organizations and pose a variety of research questions.

This sample of research questions posed by Alavi and Leidner (2001) illustrate the desire of researchers to better understand many of the social-cultural issues in KM today. Although technology allows us to communicate in real time from any place on the planet, social and organizational issues still limit our ability to communicate with people in our organization. One common theme in the frameworks described above is the discussion of the social and organizational issues prevalent in KM systems. The dominant issues in these frameworks are based on cultural factors in organizations. Culture refers to the values, beliefs, and assumptions held by organizational members (Dennison, 1996). The development of effective knowledge management is discussed in the literature, and prescribed by vendors, often from the perspective of the organization as a whole without consideration for the organization's size or structure (Serenko et al.,2007).The problem with using only the organization as the unit of analysis is that it provides little guidance for business leaders (Hedberg, 1981) in how they can influence the success of

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knowledge management programs (Grant, 1996; Janz and Prasarnphanich, 2003; Lynn et al., 2000). Knowledge management research could provide more value if the unit of analysis (individual, team, or organization) is aligned with the practitioner's level of implementation.

The paper presented several contributions. First of all, research determines impact of organizational culture on the KM effectiveness at the individual level. Other research has examined these factors in isolation with respect to a specific construct in KM in the context of how a particular construct affects KM processes such as knowledge creation or knowledge transfer. The second contribution is the study will examine KM in a more holistic sense and examine the factors individually and collectively together with their relationship to effectiveness, and the third contribution is, there is little or no research on the impact of organizational culture on knowledge management effectiveness in Iranian government organizations.

2- Literature review

2-1 Knowledge management

Beginning in the early 1990s, the idea of knowledge management was a response to increasing competition resulting from advancing technology and the demands of more sophisticated customers (Mattson et al., 2000). Knowledge considers the new wealth of organizations by which superior business performance and a competitive advantage can be achieved (Al-Alawi et al., 2007; Amit and Schoemaker, 1993; Barney, 1991; Bohn, 1994; Drucker, 1992; Gloet and Terziovski, 2004; Grover and Davenport, 2001; Hoopes and Postrel, 1999; Jolly and Thérin, 2007; Kalling, 2003; Liu and Tsai, 2007; Prahalad and Hamel, 1990; Stewart, 1991, 1997; Teece, 1982). Knowledge management hinges on the notion that employees possess knowledge (tacit knowledge) that can be used to achieve superior business performance (Al-Alawi et al., 2007; DeTienne and Jackson, 2001; Drucker, 1992; Gloet and Terziovski, 2004; Grover and Davenport, 2001; Hoopes and Postrel, 1999; Jolly and Thérin, 2007; Kalling, 2003; Liu and Tsai, 2007).

The basic idea is that employee knowledge can be guided, managed, controlled, or manipulated for

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a desired outcome (Land et al., 2005), usually through a formalized process for capturing individual expertise and experience (Appleyard, 1996; Gloet and Terziovski; C-P. Lee et al., 2007; J. N. Lee, 2001; Porter- Liebskind, 1996; Spender, 1996), transforming it to the organization through integration (Edgington and Chen, 2002; Grant, 1996, 1997)for the purposes of knowledge re-use, which creates new knowledge (Nonaka, 1991; Nonaka and Takeuchi, 1995), thus resulting in improved performance through improved capabilities (Bose, 2004; Dawson, 2000; Goh, 2003; Gold et al., 2001; Ju et al., 2006; C-P. Lee et al., 2007; J. N. Lee, 2001; Paisittanand et al., 2007; Yang and Chen, 2007), such as improved ability to innovate (DeLong, 1997; Duffy, 1999, 2000; Leonard, 1995; Leonard and Sensiper, 1998). Knowledge management programs are often implemented at the team level, such as project teams, business units, and social network groups due to the complexities involved with a company-wide implementation (Bixler, 2002; Bollinger and Smith, 2001; Connelly and Kelloway, 2003; Janz and Prasarnphanich, 2003; Peachey, 2006; Serenko et al., 2007; Walczak, 2005).

Knowledge management processes are needed so that knowledge can be efficiently captured, reconciled, stored, shared, and integrated (Almeida, 1996; Appleyard, 1996; Davenport et al., 1996; Grant, 1996; Leonard, 1995; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995; Porter-Liebskind, 1996; Szulanski, 1996). Many researchers and practitioners have defined knowledge management from pluralistic points of view. In general, there are three major trends in defining knowledge management: work processes or activities (Carvalho and Ferreira, 2001; Marwick, 2001; Milam, 2005), technological infrastructure (Alavi and Leidner, 1999; Chinowsky and Carrillo, 2007; Hansen et al., 1999),or behavioral norms and practices – often called organizational culture(Chong et al., 2000; De Long, 1997; Hauschild et al., 2001; Pauleen et al.,2007).The research literature has emphasized that firms must move beyond information management into the scope of knowledge management in order to recognize, accumulate, create, transform, and distribute knowledge (e.g., Bose et al., 2000; Goh, 2003; Gold et al., 2001; Ju et al., 2006; Lee et al., 2007; Paisittanand et al., 2007; Yang and Chen, 2007).

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2-2 Knowledge management effectiveness

The theory of knowledge management effectiveness from the perspective of organizational capability was developed byGold et al. (2001).The theory is built on the two fundamental concepts of social-capital (its role in creating intellectual assets) and knowledge-integration (its role in creating a knowledge synthesis). Gold et al., (2001) provided a definition and empirical context for assessing knowledge management from the perspective of organizational capabilities that lead to improved business performance, as measured by organizational effectiveness Gold et al. (2001).The implementation of an effective KM system will often require people to change the way they interact with other people in the organization and their perceptions of the benefits of a knowledge friendly culture (Davenport et al., 1998). Several factors thought to be related to KM effectiveness are: specific links to performance, technical and organizational infrastructure, knowledge-friendly culture, change in motivational practices, and senior management support (Davenport et al., 1998).Other researchers have investigated the KM effectiveness by analyzing the results of financial or other organizational measures (Lee et al., 2005; Tanriverdi, 2005). One issue in measuring IS effectiveness, and similarly KM effectiveness, is matching the levels of the dependent variables, as described by Markus and Robey (1988).Researchers must use caution to ensure that the level of the dependent variable matches what is actually being examined. If researchers are examining factors within the organization at the individual level, effectiveness should be measured at a similar level (Markus and Robey, 1988).In this study, all variables are examined at the individual level. One study suggested that effectiveness should not be measured by asking a user if something was effective or not (Davenport et al., 1998), while another adapted an instrument from another KM effectiveness measure that asked users about their satisfaction with different aspects of the system (Becerra-Fernandez and Sabherwal, 2001).

The literature is replete with examples of nontechnical investments, which can be attributed to three main factors: organizational culture and structure, and business processes (e.g., Alavi et al., 2006; Becerra-Fernandez et al., 2004; Davenport et al., 1996; Goh, 2003; Gold et al., 2001; O'Dell and Grayson, 1998; Orlikowski, 2000; Stankowsky, 2005; Sutton, 2001; Verkasalo and Lappalainen, 1998; Walczak,

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2005; Widen-Wulff and Ginman, 2004; Yang and Chen, 2007). New knowledge can be considered the product of an effective knowledge management program. Accordingly, effective knowledge management is believed to contribute to organizational performance and lead to a competitive advantage (Amit and Schoemaker, 1993; Chuang, 2004; Drucker, 1992; Jolly and Thérin, 2007; Kogut and Zander, 1992; Narasimha, 2000; Spender and Grant, 1996).

2-3 Cultural factors and Knowledge management

The cultural component refers to the firm's vision and values, and the attitudes toward learning and knowledge transfer (Gold et al., 2001; Hult et al., 2000; Janz et al., 1997; Senge, 1990). Culture is a key component of knowledge management. Organizational culture is positively related to knowledge management programs. Chin-Loy and Mujtaba (2007)Organizational culture influences the adoption of knowledge management (P. Sanchez, 2004), and is one of the most significant hurdles of knowledge management effectiveness to overcome (Gold et al., 2001; Hinds and Aronson, 2002; H. Lee and Choi, 2003).Although shaping the culture to align with knowledge management goals is essential (Davenport and Klahr, 1998; Davenport et al., 1998; DeLong, 1997), in practice it is a complex undertaking, particularly in large or hierarchically structured and bureaucratic organizations (Brown and Duguid, 1998; Grant, 1996; Nonaka, 1994).

Cultural shifts are more easily achieved in companies with fewer employees, smaller groups in large organizations, and firms characterized as entrepreneurial (Becerra-Fernandez et al., 2004), due to the flexibility of the subcultures that exist in these smaller groups (Janz and Prasarnphanich, 2003).In large organizations, it may be more effective to implement knowledge management in teams defined by social networks (Allee, 2008), and then link the teams intra-organizationally (Peachey, 2006; Serenko et al., 2007). An organization's culture is one of the most important factors in effective KM. As will be discussed below, most researchers believe it is difficult to change, yet almost an a priori requirement for effective KM. Jaskyte (2004) states that leaders have a major impact on the formation of organizational

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culture through their beliefs, values, and assumptions. This research will focus on the second aspect of organizational culture and its interaction with KM programs. Since organizational culture reflects values, beliefs, principles, and behaviors within an organization, it is clearly linked with effective knowledge management (Iftikhar, 2003). It has been proven that various approaches and tools used for knowledge sharing and teamwork would have failed without the supportive organizational culture. Many researchers and practitioners agree that knowledge management should be supported by a knowledge-sharing culture (Chong et al., 2000 et al., 2001; Iftikhar, 2003; Martin, 2003; Pauleen et al., 2007). Knowledge management is a context embedded and particularly culturally dependent process (Pauleen et al., 2007).

3- Methodology and survey instrument

A target is the entire group of people, objects or events that the researcher wishes to study. An executive is a senior manager in an organization or company whose job is to make and to implement major decisions. Executives play key roles in knowledge management and they have a strong understanding of the organizational characteristics and environment. Therefore, the target population for this study was 92 executives in county and municipal government organizations in Iran. Particularly, this study examined municipal government and county employees working in 30 different county departments with the 10 highest populations in Iran, that the implementation of a knowledge management system. To represent the research population, the characteristics of the sample consisted of knowledge executives who, first, rank from individual contributor through the CEO, second, they are located in different functional teams across each of the geographical theaters in the company, third, they are familiar with the organization's culture, processes, patterns, concepts, categories, properties, and dimensions regarding knowledge management programs, and the organization's vision, values, and objectives in their organizations.

The instrument, consisting of 20 questions, was primarily developed from prior research. Table 1 shows the number of questions per dimension. There are two foundation articles that comprise the majority of the instrument items.

Table 1: Number of questions per dimension

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Dimension	Per dimension	Number of Questions per Dimension
	Corporate visions	5
Organization Culture factors	Mission statements	5
	Information services	5
KM Effectiveness	(Single construct)	5
Total	-	20

3-1 Variables and measure

The main aspects of culture that were thought by previous researchers to be pertinent to KM success are corporate visions, mission statements, and information services. The constructs use multiple-item measures, which increase accuracy and consistency when measuring the variables (Churchill, 1979; Nunnally, 1978). Measuring the variables with Likert-type scales facilitates standardizing and quantifying the relative effects (Gold et al., 2001).Higher scores in this measure indicate a more knowledge oriented culture that suggests higher levels of KM effectiveness. A strong knowledge culture encourages interaction and collaboration to promote the necessary change to meet organizational goals (Kanter et al., 1992; Nonaka and Takeuchi, 1995). The goals should be clearly communicated through the firm's vision and values, and should emphasize the role of knowledge in achieving the firm's goals (Gold et al., 2001).The specific items for corporate visions, mission statements, and information services were taken from Gold et al., (2001) study.

Based on a qualitative study and previous research in KM, researchers developed 11 items to measure knowledge effectiveness at the individual level (Becerra-Fernandez and Sabherwal, 2001) Using factor analysis (principal component method with varimax rotation) the researchers found that the 11 questions loaded on a single factor. The items showed a reliability of 0.92. Four of the items were very similar to other items, except they asked the question in a different context, i.e. one question at directorate level, and another at organization level. Given that this study will not differentiate between organizational levels within an organization, these duplicate questions were dropped, leaving five questions to assess the KM effectiveness at the individual level.

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Table 2 outlines the sources of the item generation. As described above, many of the constructs and underlying items were taken verbatim from the original research. In other cases, items previously validated by other researchers were edited slightly to increase readability or precision in the question. This technique is common in many studies and was used in one of the key foundation articles for this research (Bock et al.,2005).

Table 2: Sources of items

Construct	Sub constructs	Source
Organization Culture	Corporate visions	(Chong et al., 2000)
	Mission statements	(Chong et al., 2000)
	Information services	(Chong et al., 2000)
KM Effectiveness	(Single construct)	(Becerra-Fernandez and Sabherwal, 2001)

4- Hypothesis and conceptual framework

The model shown in Figure 1 shows the constructs and indicators for this study. This figure shows the one main construct of culture as independent variables. KM effectiveness is the dependent variable. Each construct was a key factor in previous research in predicting some form of KM effectiveness. This study tested the hypotheses that the cultural factor correlate with Knowledge management effectiveness.

4-1 Hypotheses

Hypothesis 1: Cultural factors such as corporate visions, mission statements and information services are positively related to KM effectiveness.

Hypothesis 2: corporate vision as a cultural factor is positively related to KM effectiveness.

Hypothesis 3: Mission statement as a cultural factor is positively related to KM effectiveness.

Hypothesis 4: Information services as a cultural factor is positively related to KM effectiveness.

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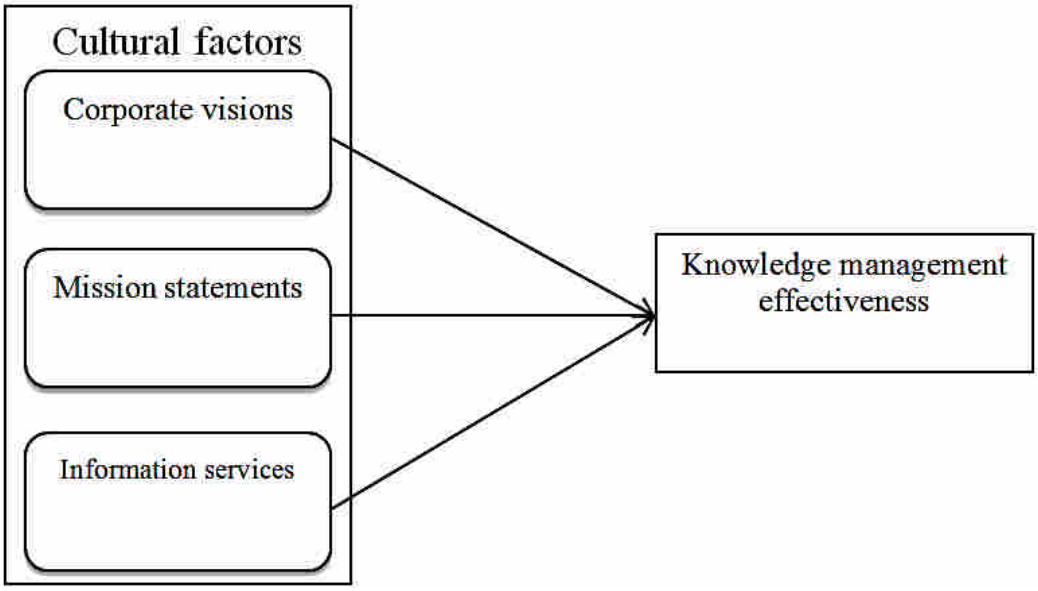

Figure 1: Conceptual framework

5- Results

Partial Least Squares (PLS) is gaining popularity among IS researchers because of its relaxed assumptions regarding normality and its ability to deal with small sample sizes in addition to being particularly useful for constructs with measurement error and covariance (Chin et al., 2003; Gefen and Straub, 1997). The ability of PLS to handle a high degree of covariance is critical because of the homogeneity of this sample. PLS is widely used in information systems research and can be used to analyze structural models with multiple item constructs (Chin andTodd, 1995). PLS simultaneously tests the validity and reliability of the data and estimates the differences between constructs. PLS requires minimal sample sizes to validate a model compared with alternate structural equation modeling techniques (Bock et al., 2005). The number of predictors is the highest number of formative indicators on any one construct or the number of constructs affecting the dependent variable. This model required a sample of 90.

5-1 Reliability

Reliability is essentially an evaluation of measurement accuracy, for example, the extent to which the respondent can answer the same or approximately the same questions the same way each time. High correlations between alternative measures or large Cronbach alphas are usually signs that the measure is

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reliable. A commonly used standard for reliability is 0.70. The reliability of the measure also affects the required number of indicators per construct. With more reliable measures (loadings of 0.80 or higher), requirements for sample size and 6 to 8 indicators per construct may be relaxed (Chin et al., 2003).A commonly used threshold is 0.70 as with other reliability measures such as Cronbach's alpha.

5-2 Validity

Content validity is the degree to which items in an instrument reflect the content universe to which the instrument will be generalized. This validity is generally established through literature reviews and expert judges or panels. In this research, the constructs were chosen after an extensive literature review. Each of the constructs in this study was already posed to affect some aspect of knowledge management. Other key literature in the field was then used to justify the case that these constructs were relevant to this study and to KM effectiveness. Construct validity is the extent to which an operationalization measures the concepts that it purports to measure. The focus on construct validity is on whether the selected items move together in such a way that they can be considered as an intellectual whole.

Factorial validity will be assessed using the technique described by Gefen and Straub (2005) focusing on convergent and discriminant validity (Gefen and Straub, 2005). Convergent validity is demonstrated when items thought to measure a construct show high correlation with each other, particularly when compared with items thought to measure other constructs. Convergent validity is shown when each measurement item load on its latent construct with a significant t-value (Gefen and Straub, 2005) The outer model loadings of this research model generated in PLS show a T-value greater than 1.96 to demonstrate the convergent validity (Gefen and Straub, 2005). Discriminant validity is demonstrated when the measurement items that comprise a construct differ from those that comprise other constructs. Discriminant validity is shown when the correlation of the latent variables show a pattern of loading highly on their assigned construct and lower on other constructs. This test is to determine if the correlation of the measurement items is larger than the correlation with other constructs. For average variance extracted, (AVE) a score of 0.5 is acceptable and the square root of the AVE should be greater than the levels of correlations involving the construct. AVE estimates also should be greater than the

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square of the correlation between that factor and other factors to provide evidence of discriminant validity. Therefore, if all AVEs of the variables in one model are over than their responding shared variances, we can claim the discriminant validity. The structure had the lowest AVE of 0.625. Table 3 outlines these results.

Table 3: Reliabilities and Ave

Construct	Composite Reliability	AVE
Corporate visions	0.940	0.848
Mission statements	0.926	0.899
Information services	0.932	0.826
Effectiveness	0.932	0.752

Examining the square root of AVE can be used to verify the discriminant validity of an instrument. The second requirement to test discriminant validity is to compare the correlations between constructs with the square root of the AVE. The square root of the AVE should be much higher than the correlation with any other construct.Table 4 shows these scores.

Table 4: Correlation

	Effectiveness	Corporate visions	Mission statements	Information services
Effectiveness	1			
Corporate visions	0.712	1		
Mission statements	0.643	0.732	1	
Information services	0.576	0.541	0.767	1

After convergent and discriminant validity checks and item reduction, this model ended with between three and nine items per construct which is similar to or in excess of other studies published in IS journals that have used between two and five indicators per construct. Hypothesis 1, that culture is a significant predictor of KM effectiveness was not supported. None of the underlying constructs of corporate visions, mission statements, or information services were significant predictors of KM effectiveness. Table 5 summarizes these results. Previous research has suggested that an organization's culture is important to effective KM. The difference between these conclusions could be the level of the

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dependent variable. The study by Gold et al., focused on organizational level effectiveness, but the study reported here measured the dependent variable of KM effectiveness at the individual level. The divergence between the significance of culture at the organizational level and this study suggests an interesting conclusion.

For an individual to perceive his or her KM as effective and important to their work, organizational culture may not matter. An organization may have a culture that is not one that is generally perceived as having a positive impact on KM, yet still be effective at KM at the individual level. This still has immense benefits for the organization in that if individuals are more effective at KM, the organization can still benefit from their efforts based on the results of Gold et al.

Table 4: correlation

H	Construct	Path Loadings	Effectiveness (T-statistic)	Result
H1	Organizational culture			Not Supported
H2	Corporate visions	-0.0065	0.0528	Not Supported
H3	Mission statements	-0.0165	0.1272	Not Supported
H4	Information services	0.0401	0.3751	Not Supported

6- Conclusion

This research produced interesting results for both researchers and practitioners. By developing and measuring the constructs with the dependent variable KM effectiveness, this study differs from other research that focused on one area of KM such as knowledge transfer. It is known that a company's employees play a critical role when it comes to generating and applying knowledge in their organizations (Garud and Kumaraswamy, 2005). Employees are the starting block for effective KM. This research suggests areas that an organization can focus on to facilitate this process.

There were several limitations of this study. Frist of all, this study is the lack of participation from the private sector. The results are biased toward public organizations such as county and municipal government organizations that have inherent less flexibility with their structure. In the last 20 years, government organizations have undergone a significant change by reducing layers of bureaucracy, yet they still lack the flexibility of private section organizations.

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The second limitation of this study is that the variables employed to measure the latent constructs are not all inclusive. That is, there are other factors that may affect these constructs for example technological capabilities, climatic factors, and structural factors. Also, culture has been operationalized in a variety of ways including collaboration, and learning, and as expertise, interaction, vision, innovativeness, and objectives among many others. However, based on the literature review the variables used in this study are indicative of the constructs if not universally completely.

Future research should continue to examine the constructs of culture, climate, and structure and seek to ground this research in the management literature where the constructs were first examined in the organizational context. It is possible that culture would be a significant predictor of KM effectiveness in a sample based on private organizations. The range of organizational cultures seems much broader in private organizations in contrast to government organizations which are much more restricted. Government organizations are constrained by less flexible budgets, public law, and other factors that tend to increase bureaucracy.

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FORECASTING STUDENT ENROLLMENTS TO UNIVERSITIESTHROUGH TREND CENTRALITY-BASED FUZZY TIME SERIES

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Abstract

This study aims to adapt trend centrality to fuzzy time series model in order to predict the future students enrollments to universities of Northern Cyprus. A trend centrality-based fuzzy time series model is proposed and applied as the forecasting model. Both in-sample and out-of-sample predictions are performed. Actual enrollments to universities of Northern Cyprus are examined from 1995 to 2009, and then forecasted enrollments are obtained from 2000 to 2009. Future enrollments up to 2015 are predicted using trend centrality of actual and forecasted enrollments that are obtained by using fuzzy time series. It is observed that there is an incremental trend in student enrollments in Northern Cyprus entailed substantial economic benefits to the country.

Keywords: Fuzzy time series; Trend Centrality; Forecasting student enrollments.

ISSN 2076-9202

1 Introduction

Literally, forecasting is the use of historic data to determine the direction of future trends. Faced with doubts about the future, the decision-maker requires as much information about the past and the future as possible. The objective of forecasting is to minimize uncertainty and to identify and evaluate risk. For these reasons, the problem of forecasting needs to be approached in a scientific manner. Forecasting problems have been solving by increasing number of forecasting methods.

Zadeh (1965) introduced the fuzzy set theory, whose primary purpose is to reduce system uncertainty. Literally, uncertainty is a term that describes the dispersion of the outcomes. The fuzzy sets were designed to mathematically represent the uncertainty. The fuzzy set theory is an alternative for increasing predictive performance. For this reason, the fuzzy set theory has been broadly used in forecasting.

In recent years, several methods and techniques such as Delphi method, exponential smoothing, moving average, and least squares method have been proposed for forecasting based on the fuzzy set theory.

During last few decades, various approaches have been developed for time series forecasting. Forecasting problems are handled using fuzzy time series to overcome the drawback of the classical time series methods since they can not deal with forecasting problems in which the values of time series are linguistic terms represented by fuzzy sets (Hwang et al, 1998).Fuzzy time series can work under the linguistic time series, and even can work when some of the data are not available. Fuzzy time series model can be established under the time space or state space conditions.

In the literature, the fuzzy time series models can only forecast the next year based on the historical data. However, we generally need more forecasts than one year for future plannings and for enhancing accurate decision making. From this standpoint, this study aims to adapt trend centrality to fuzzy time series model in order to predict the future students

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enrollments to universities of Northern Cyprus. A trend centrality-based fuzzy time series model is proposed and applied as the forecasting model. Both in-sample and out-of-sample predictions are performed. Actual enrollments to universities of Northern Cyprus are examined from 1995 to 2009, and then forecasted enrollments are obtained from 2000 to 2009. Future enrollments up to 2015 are predicted using trend centrality of actual and forecasted enrollments that are obtained by using fuzzy time series.

This paper is organized as follows. Section 2 presents the basic concepts and literature review related with fuzzy time series. Section 3 expains the proposed methodology called trend centrality based fuzzy time series. Section 4 firstly summarizes the profile of higher education in Northern Cyprus, and thenprovides the application study for forecasting enrollments to universities of Northern Cyprus through trend centrality based fuzzy time series. Results and discussion are given in section 5. The last section includes the conclusions and suggestions for further research.

2 Fuzzy Time Series

In this section, the basic concepts of fuzzy time series are firstly introduced, and then a literature review related to fuzzy time series will be presented, respectively:

2.1 Basic Concepts

A time series is a sequence of real numbers where each number represents a value at a given point in time (Tang and Liao, 2008). The main goal of the conventional time series analysis is the building of mathematical models based on the known past in order to forecast time series in future. Functional trend models are utilized assuming that the models are able to generate future values. It must be taken into account that this assumption is not suitable for medium or long range forecasts.

Fuzzy time series models are of great interest in forecasting when the information is imprecise and vague. Unlike conventional

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time series models, in the fuzzy time series models, linguistic values (fuzzy sets) are used as observations. Fuzzy relational equations are employed in order to describe the dynamic process. Principally, fuzzy time series model aims to forecast future values by using fuzzy relational equations. Each value (observation) is represented by a fuzzy set. The transition between consecutive values is taken into account in order to model the time series data.

Let U be the universe of discourse with $U=\{x_1, x_2, \ldots, x_n\}$. A fuzzy set A_i is of U is defined as:

$$A_i = \mu_{A_i}(x_1)/x_1 + \mu_{A_i}(x_2)/x_2 + \mu_{A_i}(x_3)/x_3 + \cdots + \mu_{A_i}(x_n)/x_n \quad (1)$$

where is the membership function of the fuzzy set A_i, such that $\mu_{A_i}: U \rightarrow [$ and μ_{A_i} represents the grade of membership of x_j in A_i, $\mu_{A_i}: \in \rightarrow [$. In the following, six fundamental definitions of fuzzy sets and relations are given (Song and Chissom 1993a, 1993b, 1994; Hwang et al 1998).

Definition 2.1 Let $X(t)$ a subset of $\Re$, be the universe of discourse on which fuzzy sets, $f_i(t)(i = 1,2, \ldots)$ are defined such that $F(t)$ is the collection $f_i(t)$, then $F(t)$ is defined as fuzzy time series on $X(t)(t = \ldots, 0,1,2, \ldots)$. Here, $F(t)$is considered as a linguistic variable and $f_i(t)(i = 1,2, \ldots)$are considered as possible linguistic values of $F(t)$. At different times, the values of $F(t)$can be different.$F(t)$ is a function of time and similarly, the universe of discourse *X(t)* may be different at different times.

Definition 2.2If for any $f_i(t) \in$ and $f_j(t-1) \in F(t \cdot$ there exist a fuzzy relation $R_{ij}(t, t \cdot$ such that $f_i(t) = f_j(t-1) \circ R_{ij}(t, t \cdot$ where " " is the max-min composition operator, then . is said to be only affectedby $F(t \cdot$ and is denoted by $f_j(t-1) \rightarrow j$ or by $F(t-1) \rightarrow$. This relation is called first order relation.

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Definition 2.3If for any $f_i(t) \in$ and $f_i(t-1) \in F(t$, there exist a fuzzy relation $R_{ij}(t,t$ such that $f_i(t) = f_i(t-1) \circ R_{ij}(t,t$ and $R(t,t-1) = \cup_{ij} R_{ij}(t,t$, where is union operator. Then $R(t,t$ is called the fuzzy relation between and $(t$. The fuzzy relation equation is defined as follows:

$$F(t) = F(t-1) \circ R(t,t \quad (2)$$

Definition 2.4Assuming that is only affected by $F(t$ or $F(t$ or …or $F(t-$ (m > 0), then this relation can be expressed as fuzzy relational equation. The first order models are defined as follows:

$$F(t) = F(t-1) \circ R(t,t- \quad (3)$$

or

$$F(t) = (F(t-1) \cup F(t-2) \cup \ldots \cup F(t-m)) \circ R(t,t- \quad (4)$$

Definition 2.5Assume that is only affected by $F(t$ or $F(t$ or …or $F(t-$ (m > 0) simultaneously, then relation can be expressed in fuzzy relation equation as follows:

$$F(t) = (F(t-1) \times F(t-2) \times \ldots \times F(t-m)) \circ R_m(t,t- \quad (5)$$

The equation given above is called the *m*th order model .

Definition 2.6Let be fuzzy time series and known as time-invariant fuzzy time series. Then, let the $R(t,t$ be a first order model of such that $R(t,t-1) = R(t-1,t$ for any time t. If $R(t,t$ is time dependent, the $R(t,t$ may be different from $R(t-1,t$ for any time t, then is called time-variant fuzzy time series.

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2.2 Literature Review

Initially, the fuzzy time series method is introduced by Song and Chissom (1993a, 1993b) in 1993.Afterward, Song and Reland (1993) and Song (2003) continued to present forecasting methods to forecast the enrollments of the University of Alabama. Song and Chissom (1993b) developed a fuzzy time series model using historical data, and then they proposed a complete procedure that includes: fuzzifying the historical data, developing a fuzzy time series model, and calculating and interpreting the outputs. Also, Song and Chissom (1994) proposed the first-order, time-variant fuzzy time series model to forecast the enrollments of the University of Alabama. They converted the output of the model using a 3-layer backpropagation neural network. Results showedsmallest average forecasting error could be obtained by the neural network defuzzification method.

Later, new versions of the method proposed by Song and Chissom were developed by many researchers such as time-variant and time-invariant; univariate and multi-variate; first-order and high-order, and etc. These methods have either used enrollment numbers or differences of enrollments as the universe of discourse (Stevenson and Porter, 2009).

Chen (1996) presented a method to forecast the enrollments of University of Alabama based on fuzzy time series. They concluded that their method could make good forecasts of the university enrollments and could make robust forecasts when the historical data are not accurate. They found their method more efficient than the method of Song and Chissom (1993a) due to the fact that they used simplified arithmetic operations rather than the complicated max-min composition operations used by Song and Chissom (1993a).

Sullivan and Woodall (1994) reviewed the first-order time-variant fuzzy time series model and the first-order time-invariant fuzzy time series model proposed by Song and Chissom and compared the models with each other and with a time-variant Markov model using linguistic labels with probability distributions.

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Hwang et al (1998) used the differences of the enrollments to present a method to forecast the enrollments of the University of Alabama based on fuzzy time series. They simplified the arithmetic operation process and enhanced efficiency.

Huang (2001, 2002) used simplified calculationswith the addition of heuristic rules into the judging criteria of future trends, and developed a heuristic fuzzy time series model to forecast the enrollments using Chen (1996).

Chen (2002) proposed a forecasting method basedon high-order fuzzy time series and developed an algorithm for forecasting the enrollmentsof the University of Alabama.Chen (2002), Chen and Chung (2006a, 2006b) and Chenget al (2006) presented several forecast models based on fuzzy time series to deal with the enrollments forecasting problem and obtain better forecasted accuracy with high-order fuzzy time series.

Melike and Konstsntin (2004) presented a new first order time series model for forecasting enrollments of the University of Alabama. Melike and Degtiarev (2005) proposed a forecasting approach using time-invariant fuzzy time series. They found that their time-invariant method improved the performance of forecasting process. Subsequently, they compared the performance of the proposed method with existing fuzzy time series time-invariant models using historical enrollment of the University of Alabama based on forecasting accuracy.

Jilani et al (2007) proposed a new method of fuzzy time series based on frequency density based partitioning of the historical enrollment data. The proposed method belongs to the *k*th order and time-variant methods.

Some researches that use enrollment numbers and differences of enrollments as the universe of discourse are summarized in Table I. Table I classifies the above studies with respect to the used methods.

The following studies aimed at improving the computational content of Song and Chissom's (1993) method.

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Singh (2007) presented a robust method with simple computational algorithms. The computational algorithms of the proposed model have complexity in linear order. Its simplicity can be viewed as neither it requires the process of generating relational equations by using complex min–max composition operations nor needs to apply the various defuzzification processes.

Wang and Hsu (2008) developed fuzzy time series models to forecast short-term series data. The tourism data from Taiwan to the United States were used to build the sample sets which were officially published annual data for the period of 1991–2001. The root mean square error and mean absolute percentage error were selected as the two criteria for evaluating the forecasting performance.

Chen et al (2009) presented a new method for forecasting the enrollments of the University of Alabama based on the automatic clustering techniques and fuzzy logic relationships. Their proposed method applies the proposed automatic clustering algorithm to generate the clustering-based intervals, and then divides each obtained interval into *p* sub-intervals, where p, to give each interval a different length. According to the experimental results, the proposed method had a smaller mean square error and higher average forecasting accuracy rate than methods of [Song and Chissom (1993a); Sullivan and Woodall (1994); Chen (1996); Huarng (2001); Cheng et al (2006)].

Li et al (2011) proposed a vector forecasting model that allows the prediction of a vector of the future values in one step by integrating the sliding window and fuzzy c-means clustering in order to deal with vector forecasting and interval partitioning.

Gangwar and Kumar (2012) presented a computational method for forecasting based on multiple partitioning and higher order fuzzy time series to establish the fuzzy logical relations of different order for each forecast. They developed computational method providing a better approach to enhance the accuracy in forecasted values. Robustness of the proposed method has been implemented on case of external perturbation that causes the fluctuations in time series data. The general suitability of the developed model has been tested by implementing it in forecasting of student enrollments at University of Alabama.

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Joshi and Kumar (2012) proposed a computational model of forecasting for fuzzy time series based on Intuitionistic Fuzzy Sets (IFSs). They used degree of nondeterminacy to establish fuzzy logical relations. They fuzzified the time series data on the basis of degree of nondeterminacy in IFSs. They implemented their method on the historical enrollment data for the University of Alabama used in (Song and Chissom 1993a, 1994) to show the superiority of the proposed method over existing methods.

3 Proposed Methodology: Trend Centrality-Based Fuzzy Time Series

Initially, Song and Chissom (1994) proposed the step-by-step procedure to develop and utilize the time-variant model, which is explained as follows:

Step 1. Define the universe of discourse *U* within which fuzzy sets.

Step 2. Divide the universe discourse *U* into several equal length intervals.

Step 3. Determine some linguistic values.

Step 4. Fuzzify the historical enrollment data.

Step 5. Select a suitable parameter *w*, where w > 1, calculate the fuzzy operation $R^W(t, t \cdot$ and forecast the enrollment. The time-variant fuzzy time series method can be explained as

$$F(t) = F(t-1) \circ R^W(t, t \cdot \qquad (6)$$

where

$$R^W(t, t-1) = F^T(t-2) \times F(t-1) \cup F^T(t-3) \times F(t-2) \cup \ldots \cup F^T(t-w) \times F(t-w \cdot \qquad (7)$$

where *w* is the model basis denoting the number of years before *t*, . is the value of fuzzy time series, " " is the Cartesian operator, and *T* is the transpose operator.

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Step 6. Defuzzify the forecasted outputs using the neural nets.

Hwang et al (1998) extended the above method of Song and Chissom (1994). In this section, in order to predict the future students enrollments to universities of Northern Cyprus, the concept of *trend centrality* to fuzzy time series model of Hwang et al (1998) is adapted, and the forecasting model called trend-centrality-based fuzzy time series is proposed.

Notably, it is possible to say that the definition of the window basis *w* in our proposed method adapted from Hwang et al (1998) is similar to the the definition of the model basis used by Song and Chissom (1994).

Since Song and Chissom's (1994) and Hwang et al's (1998) models can only forecast the next year based on the historical data. From this standpoint, we incorporate the concept of *trend centrality* to their models.

The step-by-step procedure of our method called *trend centrality-based fuzzy time series* is explained as follows:

*Step 1.*Compute the variations of the actual enrollments between any two continuousyearsfrom the historical enrollment data. The variation of considered year is the actual enrollment of the considered year minus the actual enrollment of the previous year of that considered year.Afterwards, find the minimum increase D_{min} and the maximum increase D_{max}. Then, set D_1 and D_2 as the suitable positive numbers and define the universe of discourse U representing as U=[$D_{min} - D_1$, $D_{max} + D_2$].

Step 2. Divide the universe of discourse U into several even length intervals, $u_1, u_2,..., u_n$

Step 3. Define fuzzy sets on the universe of discourse U. Determine some linguistic values represented by fuzzy sets to define the degree of variation between two continuous years.

Step 4. Fuzzify the values of historical data. If the number of variation of the enrollment of year i is p, where , and if there is a value represented by fuzzy set A_k in which the maximum membership value occurs at u_j, then p is translated to A_k.

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Step 5. Select a suitable window basis *w*. Compute the output from the operation matrix O and the criterion matrix , where *t* is the year to forecast the enrollment. Then, compute the relation matrix defined as $R(t)[t,j] = O^{w}(t)[t,j] \times C($; where $1 \leq t$, and $1 \leq j$.

Step 6. Defuzzify the fuzzy forecasted variations, which are obtained in Step 5.

Step 7. Compute the forecasted enrollments according to the forecasted variation plus the number of actual enrollment of previous year.

*Step 8.*Predict or forecast future values using trend centralities (Y_i) of actual and forecasted enrollments that are obtained from fuzzy time series.

4 An Application

In this section, the proposed methodology called trend centrality-based fuzzy time series model is applied to forecastthe student enrollments to universities of Northern Cyprus.

4.1 Higher Education in Northern Cyprus

Prior to the 1963 inter-communal conflict in Cyprus, Turkish Cypriots had only one education institution called "Turkish Cypriot Teacher's Academy" established in 1934. Following the division of the island in 1974, the Turkish Cypriot administration realized the absence of higher educational opportunities in Northern Cyprus. This led to the establishment of a Higher Technological Institute (HTI) in 1979, with English as the medium of instruction. In 1981, the high academic standards and laboratory facilities at the HTI are recognized, and the Turkish Higher Education Council (YÖK) of Turkey accredited a four-year B.Eng. course, which was instituted in 1982; the first B.Eng. degrees were conferred in June 1984. In 1986 the

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governments of the Northern Cyprus and Turkey agreed to establish a university in Northern Cyprus under the aegis of YÖK. In June 1986, the Parliament passed a new law that formally granted the HTI a charter establishing it as a "state-trust" institution of higher education and HTI became Eastern Mediterranean University (EMU). EMU was then fully accredited by YÖK. As a result, despite the non-recognition of Northern Cyprus, the degrees and diplomas awarded by EMU have generally been recognized internationally. After 1986, the campus and academic infrastructure of EMU grew at an extraordinary rate. Campus development of buildings was funded by the government of Northern Cyprus, primarily with aid from Turkey. Consequently, private universities began to spring up around North Cyprus in turn. Girne American University (established in 1985), Near East University (established in 1988), European University of Lefke (established in 1989), and Cyprus International University (established in 1997). In addition to these universities, there are private campuses of Turkish state universities. Middle East Technical University North Cyprus campus (METU-NCC) established in 2002. In 2006, Istanbul Technical University (ITU) opened campuses in Northern Cyprus. Also, Gazi University is performing the initiatives of opening campus that provides education in healthcare.

Universities play important role in Northern Cyprus, which is a devoloping country in eastern mediterranean region. The universities established in Northern Cyprus are producing science and technology within innovative, developmental perspectives. They are able to offer quality and sustainable education at universal standards. They try to produce, apply, promote and enrich knowledge, and educate individuals with the knowledge for the social, cultural, economic, scientific and technological development of humanity. They also try to provide solutions to the problems of national, regional and the international community. Universities in Northern Cyprus aim to become first choice of national and international students.

As a matter of fact, higher education seemed to be a large part of the answer to economic isolation of Northern Cyprus. It is observed that there is an incremental trend in student numbers in Northern Cyprus entailed substantial economic benefits to the

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country whose international non-recognition had effectively crippled the tourism as well as the other sectors. The revenues gained by the education sector is USD 400 million in 2011. Today, there are more than 40,000 students, which are studying at various universities in Northern Cyprus. These students are more than 25.000 from Turkey and more than 4000 from 65 different nationalities.

4.2 Application Study

Application study is performed by following the steps of the proposed methodology given in the previous section.

Step 1. From the historical enrollment data of universities of Northern Cyprus, the variations of the actual enrollments between the two consecutive years are evaluated. The variation of considered year is the actual enrollment of the considered year minus the actual enrollment of the previous year of that considered year. According to the actual enrollments, which are used as historical data of student enrollments to universities of Northern Cyprus, the variations of the enrollments between any two consecutive years are computed and given in Table II.

Afterwards, the minimum increase D_{min} and maximum increase D_{max} are identified. Then, the universe of discourse Ucan be defined as U=[-5500, 6500].

Step 2. The universe of discourse U are divided into six intervals, where u_1=[-5500, -3500], u_2=[-3500, -1500], u_3=[-1500, -500], u_4=[-500, 2500], u_5=[2500, 4500], and u_6=[4500, 6500].

Step 3. Some linguistic values are determined and represented by fuzzy sets to define the degree of variation between two consecutive years. In this study, six fuzzy sets are considered as A_1=(big decrease), A_2=(decrease), A_3=(no change), A_4=(increase), A_5=(big increase), A_6=(too big decrease). The fuzzy sets A_1, A_2, …, A_6 are defined on the universe of discourse U as follows:

$$A_1 = {}^{1}/_{u_1} + {}^{0.5}/_{u_2} + {}^{0}/_{u_3} + {}^{0}/_{u_4} + {}^{0}/_{u_5} + {}^{0}/_{u_6}$$

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$A_2 = {}^{0.5}/_{u_1} + {}^{1}/_{u_2} + {}^{0.5}/_{u_3} + {}^{0}/_{u_4} + {}^{0}/_{u_5} + {}^{0}/_{u_6}$

$A_3 = {}^{0}/_{u_1} + {}^{0.5}/_{u_2} + {}^{1}/_{u_3} + {}^{0.5}/_{u_4} + {}^{0}/_{u_5} + {}^{0}/_{u_6}$

$A_4 = {}^{0}/_{u_1} + {}^{0}/_{u_2} + {}^{0.5}/_{u_3} + {}^{1}/_{u_4} + {}^{0.5}/_{u_5} + {}^{0}/_{u_6}$

$A_5 = {}^{0}/_{u_1} + {}^{0}/_{u_2} + {}^{0}/_{u_3} + {}^{0.5}/_{u_4} + {}^{1}/_{u_5} + {}^{0.5}/_{u_6}$

$A_6 = {}^{0}/_{u_1} + {}^{0}/_{u_2} + {}^{0}/_{u_3} + {}^{0}/_{u_4} + {}^{0.5}/_{u_5} + {}^{1}/_{u_6}$

Step 4. The values of historical data of actual enrollments are fuzzified. If the number of variation of the enrollment of year *i* is *p*, where p, and if there is a value represented by fuzzy set A_k in which the maximum membership value occurs at u_j, then *p* is translated to A_k.

Step 5. A suitable window basis is selected. The output from the operation matrix O and the criterion matrix , where *t* is the year to forecast the enrollment, are evaluated. Then, the relation matrix represented by $R(t)[t,j] = O^{w}(t)[t,j] \times C($, where $1 \leq t$, and $1 \leq j$, is computed. The fuzzified forecasted variations from 2000 to 2009 are computed and the results are listed in Table III.

Table 3. Fuzzified forecasted variations with the window basis (w=5)

Years	Membership functions of forecasted variations					
	u_1	u_2	u_3	u_4	u_5	u_6
2000	0	0	0,25	1	0,5	0
2001	0	0	0,25	1	0,5	0
2002	0	0	0,25	1	0,25	0
2003	0	0	0,25	1	0,25	0
2004	0	0	0	0,5	0,5	0
2005	0	0	0	0	0,5	0,5
2006	0	0	0	0	0,5	1
2007	0	0	0,25	0	0	0
2008	0	0	0	0,25	1	0,5
2009	0	0	0	0,25	1	0,5

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Step 6. The fuzzy forecasted variations, which are obtained in Step 5, are defuzzified.

*Step 7.*Forecasted enrollments are predicted according to the forecasted variation plus the number of actual enrollment of previous year. The results of the forecasted enrollments to the universities of Northern Cyprus and the corresponding errors under the window basis w=5 are provided in Table IV.

Step 8. Future values are predicted or forecasted using trend centrality of actual and forecasted enrollments that are obtained from fuzzy time series. The forecasted enrollments of universities of Northern Cyprus from 2010 to 2015 are shown in Table V.

5 Resultsand Discussion

The results of the forecasted enrollmentsto the universities of Northern Cyprus and the corresponding errors under the window basis w=5 are provided in Table IV.Average forecasting errors for different window bases, w=2,3,...,9, are computed and given in Table V.

It can be seen that the average forecasting errors for different window bases range from 7.86% for window basis$w$=9 down to 5.86% for window basis$w$=4. The biggest average forecasting error occured at window basis w=9 and the smallest average forecasting error occured at window basis w=4.

It is possible to say that the definition of the window basis w in the proposed method is similar to the the definition of the model basis used by Song and Chissom (1994). Principally, the previous w years of data are used to forecast the enrollment of the considered year. For forecasting, the proposed method uses actual variation rather than actual enrollments.

Future values are predicted or forecasted using trend centrality of actual and forecasted enrollments that are obtained from fuzzy time series. The forecasted enrollments of universities of Northern Cyprus from 2010 to 2015 are shown in Table VI.

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6 Conclusions

We believe that the trend centrality-based fuzzy time series model proposed in this study has simple aritmetic operation process. This makes it efficient to be utilized outperforms other studies especially in forecasting the demands such as tourism data. The tourism data of Northern Cyprus can also be examined to build the sample sets which were officially published annual data for the period of 1995–2009.

It can be concluded that the best average forecasting error value is obtained when the window basis equals to 4 (w=4). In fact, it is difficult to find the relationships between the average forecasting error and the window basis. In order to find the better window basis for forecasting enrollments, genetic algorithms can be utilized.

Generally, the focus of current fuzzy time series research has been on the establishment of fuzzy relationships and interval partitions. More recently, interval partitions have received a considerable amount attention in current studies. The main reason for this paradigm shift is the requirement of formalized approaches to interval partitioning. While in early studies, intervals were assumed to be subjectively defined by the user. On the other hand, in recent studies, interval lengths are determined independently of forecast accuracy. Genetic algorithms (GA) or particle swarm optimization (PSO) can be used to tune interval lengths in order to improve forecast accuracy. Therefore, for future studies, different heuristics methods are going to be used to enhance minimum forecasting error.

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Table I.Methods use enrollments numbers and differences of enrollments as universe of discourse

Methods using Enrollment Numbers		**Methods using Differences of Enrollments**	
Author Name	**Publication Name**	**Author Name**	**Publication Name**
Chen (1996)	*Forecasting enrollments based on fuzzy time series*	*Hwang et al (1998)*	*Handling forecasting problems using fuzzy time series*
Chen (2002)	*Forecasting enrollments based on high-order fuzzy time series*	*Song and Chissom (1993a)*	*Fuzzy time series and its model*
Chen and Hsu (2004)	*A new method to forecasting enrollments using fuzzy time series*	*Song and Chissom (1993b)*	*Forecasting enrollments with fuzzy time series Part I*
Huarng (2001)	*Effective lengths of intervals to improve forecasting in fuzzy time series*	*Song and Chissom (1994)*	*Forecasting enrollments with fuzzy time series:Part II*
Huarng (2002)	*Heuristic models of fuzzy time series for forecasting*	*Sullivan and Woodall (1994)*	*A comparison of fuzzy forecasting and Markov*

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			modeling
Jilani et al (2007)	*Fuzzy Metric Approach for Fuzzy Time Series Forecasting based on Frequency Density Based Partitioning*	*Melike and Degtiarev (2005)*	*Forecasting Enrollment Model Based on First-Order Fuzzy Time Series,*

Table II. Actual enrollments and variations of historical data

Years	Actual Enrollments	Variations
1995	16651	-
1996	19262	2611
1997	20844	1582
1998	21498	654
1999	23931	2433
2000	25765	1834
2001	26321	556
2002	27748	1427
2003	30605	2857
2004	35473	4868
2005	41865	6392
2006	38799	-3066
2007	43021	4222
2008	45634	2613
2009	40431	-5203

Table III. Fuzzified forecasted variations with the window basis (w=5)

Years	Membership functions of forecasted variations					
	u_1	u_2	u_3	u_4	u_5	u_6
2000	0	0	0,25	1	0,5	0
2001	0	0	0,25	1	0,5	0
2002	0	0	0,25	1	0,25	0
2003	0	0	0,25	1	0,25	0
2004	0	0	0	0,5	0,5	0
2005	0	0	0	0	0,5	0,5
2006	0	0	0	0	0,5	1

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2007	0	0	0,25	0	0	0
2008	0	0	0	0,25	1	0,5
2009	0	0	0	0,25	1	0,5

Table IV. Results of forecasted enrollments using fuzzy time series method with window basis *w*=5

Years	Actual Enrollments	Forecasted Enrollments	Errors (%)
2000	25,765	27,265	5.82
2001	26321	27821	5,70
2002	27748	29248	5,41
2003	30605	32105	4,90
2004	35473	37973	7,05
2005	41865	46365	10,75
2006	38799	44299	14,18
2007	43021	42521	1,16
2008	45634	49134	7,67
2009	40431	43931	8,66

Table V. Average forecasting errors for different window bases, *w*=2,3,...,9

	Window Bases							
	w2	w3	w4	w5	w6	w7	w8	w9
Average Forecasting Errors (%)	7.10	6.43	5.86	6.90	7.02	7.18	7.43	7.86

Table VI. Forecasting enrollments from 2010 to 2015

	Years					
	2010	2011	2012	2013	2014	2015
Forecasting Enrollments	49,900	50024	49581	48362	46286	44190

ISSN 2076-9202

Determinants of Capital Structure: An Analysis of Cement Industry of Pakistan

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Abstract:

This study is based on analysis on Cement Industry of Pakistan to measure the determinants of capital structure. The data used in this study has been taken from the "Balance Sheet Analysis of Joint Stock Companies listed on the Karachi Stock Exchange 2005-2010" which is published by the State Bank of Pakistan and Balance Sheet Analysis of Joint Stock Companies listed on the Karachi Stock Exchange. We used panel regression analysis and descriptive statistics for analysis.

Introduction:

The determination of the capital structure has been one of the most controversial topics in the finance since Modigliani and Miller (1958) introduced their capital structure irrelevance theory. Companies differ

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with respect to capital structure that has proved to be the source of different capital structure theories in an effort by researchers to describe deviation in capital structure over time or across regions. The real debate on the capital structure was started after the publication of the celebrated paper of Modigliani and Miller (MM) in 1958. With the assumptions of perfect market and no tax world MM proposed that the selection of debt-equity was independent of the value of the firm. In their study, on the basis of certain unrealistic assumptions like zero taxes, they concluded that a firm's value is unaffected by the level of debt used. Modigliani and Miller provided path and guidelines for the researchers to analyze the financing patterns and later several hypotheses have been put forward or considerable work has been done by researchers to analyze the determinants of capital structure. In 1963, Modigliani and Miller wrapped up the corporate tax assumption and intended that the value of the firm or cost of capital varied with the variation in the utilization of debt capital due to tax benefits (Baral 1996). MM considered the corporate taxes and concluded that due to tax deductibility of interest; the use of debt increases the value of the firm. So the firms can use 100% debt. Because of the unrealistic assumptions in MM irrelevance theory, research on capital structure gave birth to other theories: the static trade-off, the pecking order theory, signalling theory and the agency theory.

Static trade-off Theory

Myers (1984) divides the contemporary thinking on capital structure into two theoretical currents. The first one is the Static Trade-off Theory (STT), which explains that a firm follows a target debt-equity ratio and then behaves accordingly. The benefits and costs associated with the debt option sets this target ratio. These include taxes, cost of financial distress and agency cost. Um (2001) suggested that a high profit level gives rise to a higher debt capacity and accompanying tax shields. The trade-off theory has dominated the capital structure literature. The tax benefit-bankruptcy cost trade-off models predict that firms seek to maintain an optimal capital structure by balancing the benefits and the costs of debt (DeAngelo and Masulis, 1980). The benefits include the tax shield whereas the costs include expected financial distress costs. This theory predicts that firms maintain an optimum capital structure where the

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marginal benefit of debt equals the marginal cost. The implication of the trade-off model is that firms have target leverage and they adjust their leverage toward the target over time.

One of the reasons for this is that the larger the firm, the lower is the risk of bankruptcy. Large firms do not consider the direct bankruptcy costs as an active variable in deciding the level of leverage because larger firms, being more diversified, have less chances of bankruptcy, Titman and Wessels (1988). Baxter (1967) argued that the extensive use of debt increases the chances of bankruptcy because of which creditors demand extra risk premium. Litzenberger (1973) argued that if a firm's debt obligations are greater than its earnings then the firm's market value is necessarily a concave function of its debt obligations. DeAngelo and Masulis (1980) worked further on Miller's differential tax model by including other non-debt shields such as depreciation charges and investment tax credits.

Pecking Order Theory

The second theory, the Pecking Order Theory (POT) put forward by Myers (1984) and Myers and Majluf (1984), states that firms follow a hierarchy of financial decisions when establishing its capital structure. Initially, firms prefer to finance their projects through internal financing i.e. retained earnings. In case they need external financing, first they apply for a bank loan then for public debt. As a last resort, the firm will issue equity to finance its project. Thus according to POT the profitable firms are less likely to incur debt for new projects because they have the available internal funds for this purpose. When financial distress costs are high, equity-maximizing and value-maximizing firms make similar capital structure choices (Titman & Tsyplakov 2005). Titman (2003) suggest that firms may be reluctant to issue equity because of the costs associated with being scrutinized. Finally, issuing equity involves substantial transaction costs. Titman (2005) and Stutz (1990) suggest that firms may be reluctant to issue equity because of the costs associated with being scrutinized. Finally issuing equity involves substantial transaction costs. Moreover, Delcoure (2007) have also provided fresh evidence in support of pecking order theory.

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Signalling theory

The models referring to the signalling theory assume the existence of imperfect and asymmetric information between the various partners of the company. The signalling theory is initially developed by Leland and Pyle (1976) and Ross (1977). According to Leland and Pyle (1976), the value of a company is positively correlated with the managerial ownership and each change noticed on the level the managerial ownership results in a modification in the financial policy and by consequence a new value of the company. Leland and Pyle (1977) argue that the higher is the managerial ownership in the capital of the company, the larger is the debt capacity. Such strong ownership is highly recognized by the bondholders and signals confidence in the company future investments. Ross (1977) looks further in this analysis and introduces the notion of signalling in the capital structure theory. According to this theory, the managers know the true distribution of the company returns, but investors do not. He argues that higher financial leverage can be used by the managers to signal an optimistic future of the company since the debt is a contractual obligation to repay both principal and interests. This approach, originally developed by Ross (1977), explains that debt is considered as a way to highlight investors' trust in the company, that is if a company issues the debt it provides a signal to the markets that the firm is expecting positive cash flows in the future, as the principal and interest payments on debt are a fixed contractual obligation which a firm has to pay out of its cash flows. Thus the higher level of debt shows the manager's confidence in future cash flows.

Agency Theory

Jensen and Meckling (1976) are the pioneers in introducing the agency theory and in relaxing the assumption of no conflict of interest between the managers and the shareholders. Their financial model is focused mainly on the relationship between the shareholders (the principal) and the manager (agent). In particular, the managers do not always act in the interest of the shareholders and consequently the goal is not always to maximize the value of the company. In fact, the managers can adopt an opportunistic behaviour and seek to benefit from the agency relationship. This is consistent with the work of Myers

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(1977) who argues that, due to information asymmetries, companies with high gearing would have a tendency to pass up positive NPV (net present value) investment opportunities (under investment problems). Myers therefore argues that companies with large amounts of investment opportunities (also known as growth options) would tend to have low gearing ratios. According to Jensen and Meckling (1976), the managers can use the financial policy to get pecuniary as well as non pecuniary benefits (such as prestige, discretionary latitude and empire building). From the above analysis, two possible conclusions could emerge. Firstly, it would be optimal to the shareholders to raise the level of debt when the managers follow their personal objectives. Secondly, if the managers exert their discretion in the choice of the financial policy, the companies are more likely to issue debts on a level lower than the optimum. Stutz (1990) suggested that the agency problem can be solved to some extent if the management stake is increased or the proportion of debt in the capital structure is increased.

Determinants of Capital Structure:

After the contributions made by the MM in the area of capital structure; there have been lot of empirical studies conducted to understand the determinants of capital structure. Worth mentioning are Rajan & Zingles (1995), in their study used four determinants (independent variables); tangibility, sales, market to book ratio, and profitability. They found all variables significant. Rajan and Zingles in that study found tangibility and sales to be positively related and market to book ratio and profitability to be negatively correlated with debt. Wolfgang Drobetz and Roger Fix (2003) in their study used six variables: tangibility of assets, firm size, the market-to-book ratio, profitability, volatility, uniqueness of the product and non-debt tax shields. They found tangibility and size positively correlated with leverage and profitability and growth negatively correlated with leverage. Bradley et. al (1984) found that earning volatility, investment on R&D and advertising are negatively related to leverage and significant. They also found that the non debt tax shield is positively related with leverage; which is inconsistent with the theory. They found that industry classification is also relevant in capital structure decisions. According to Harris and Raviv (1991), the debt ratio increases with fixed assets, non-debt tax shield, growth opportunities and

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company size and decreases with volatility and profitability. While Titman and Wessels (1988) confirm that asset structure, non-debt tax shields, growth, uniqueness, industry classification, size, earnings volatility, and profitability are factors that may affect leverage according to different theories of capital structure.

So far as the determinants of capital structure in Pakistani firms are concerned; several empirical studies have been conducted. Some of them which are known to us are Shah, Atta, and Hijazi (2004), Hijazi, Yasir (2006), Attaullah shah, safiullah khan (2007), and Jasir ilyas (2008). Shah Atta and Hijazi (2004) conducted the empirical study on determinants of capital structure of stock exchange listed non financial firms of Pakistan. They used tangibility, size, growth and profitability as the independent variables. They found that tangibility and size are positively correlated; and profitability and growth are negatively correlated with the leverage.

Attaullah Shah (2007) conducted an empirical study on determinants of capital structure of the Karachi Stock Exchange listed non financial firms. In this study they used six independent variables. They were tangibility, size, growth, earning volatility, non debt tax shield, and profitability. They found that Tangibility is significantly related to debt. Size, has a positive correlation with leverage, growth variable was found to be negatively correlated and profitability was found to negatively related to leverage. The Jasir Ilyas (2008) did analysis on non-financial firms listed on Karachi Stock Exchange; they found a negative relationship between profitability and leverage, tangibility of the firm also showed negative relationship whereas growth, non debt tax shield, size showed positive relationship. Kanwar (2007) explained the attributes of Capital Structure in Sugar industry of Pakistan and the results depicted that return on assets, asset tangibility, market to book ratio and size were found to be significant except tax rate. Rafiq et. al. (2008) examined the chemical industry of Pakistan regarding capital structure choice and suggested that chemical sector preferred more equity financing than the debt financing. Ayesha and Mohamed (2010) did their study on private and Government owned firms. They took seven variables and their results suggested that asset tangibility (TG), Profitability (PF) and ROA is negatively correlated with debt. Where Size (SZ), Growth rate (GT) and Tax rate (TAX) is positively related with leveraged. Tariq et.

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al (2011) did analysis on sugar and allied industry of Pakistan and took 5 variables and their results indicated that size and profitability have the negative relationship and tangibility and growth have the positive relationship with the leverage. Zafar et. al (2011) took the Textile Sector of Pakistan and concluded that that Age of firm, asset structure and size of firm are positively related while growth in sales and profitability are negatively related with long term debt. Naveed et. al (2010) did an analysis on life insurance sector of Pakistan and found that Pecking Order pattern in terms of profitability, liquidity and age as leverage has a negative relationship with profitability, liquidity and age while positive relationship between leverage and size shows consistency with the Trade-off theory.

Identification of Literature Gap:

In Pakistan, various studies investigated the determinants of capital structure by selecting the sample of only non-financial firms of Pakistan. As literature shows that mostly studies are carried out in general level or consideration all firms in the economy. Some studies are conducted in sector based like chemical and textile. No cement sector study was found in literature. So there is need to conduct a study on cement sector as well. Therefore, the current study investigates the determinants of capital structure of Cement Industry of Pakistan over the period of five years from 2006 to 2010.

Research Methodology:

Data:

This study relies on the financial data of 18 firms of cement industry from 2006-2010 and has been taken from the State Bank of Pakistan Publications "Balance Sheet Analysis of Joint Stock Companies Listed on the Karachi Stock Exchange 2005-2010".

Sample Size:

As this study has targeted the Cement Sector, so only 18 firms (which are listed on the Karachi Stock Exchange) in the cement sector (whose published was available) are selected while 3 firms were not taken due to incomplete and insufficient data. So there are about 90 firm-years for panel data analysis.

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Variables of the study*:*

Rajan and Zingales (1995), in their cross-sectional study of the determinants of capital structure, examined the extent to which, at the level of the individual firm, leverage may be described by four key factors, namely, market-to-book (growth), size, profitability and tangibility. Their analysis was performed on a firm-level sample from each of the G-7 countries, and although the results of their regression analysis differ slightly across the countries, they seemed to uncover some fairly strong analysis and conclusions. This study follows the framework of Rajan & Zingles (1995) and Yasir & Hijazi (2006) that used tangibility of assets, firm size, growth and profitability of the firm as explanatory variables to find out the degree of leverage (the dependent variable). In this section, variables are explained and in which way they are measured and what empirical evidence was found by previous studies.

Leverage (LG) (Dependent Variable):

Leverage refers to the proportion of assets financed by debt. Different measures of leverage have been used in previous research studies. Frank and Goyal (2003) stated that the difference between a debt ratio based on market value and one based on book value is that the market value tends to consider the firm's future situation whereas the book value reflects the past situation. Fama and French (2000) pointed out some inconsistencies arising from the use of two different debt ratios. According to them, both theories (Pecking Order and Static Trade-off) apply to the debt book value, and there are doubts if the predictions may be extended to the debt market value.

Relaying on a previous study on non-financial Pakistani listed firms by Shah & Hijazi (2004), they used the book value measure of leverage. The main advantage of debt is that the interest payments are tax-deductible and thus it provides cash savings for the firms. As these tax shield benefits are not changed by the market value of the debt once it is issued (Banerjee, S. *et. al.* 2000), so the market value of the debt is irrelevant for this study.

On the other hand, chance of bankruptcy also increases due to primary cost of borrowing. If a firm falls in financial distress and goes into bankruptcy, then the relevant value of the debt is the book value of the debt not the market value of the debt ;Yasir & Hijazi (2006).

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Another consideration in deciding the appropriate measure of leverage is to take total debt or only long term debt to the proportion of total assets. Though capital structure theories consider long term debt as a proxy for financial leverage, the measure of total debt in this study is used because in Pakistan, firms have mostly short-term financing due to the small size of an average firm. This thing makes access to the capital market difficult in terms of cost and technical difficulties, Yasir & Hijazi (2006). In Pakistan, firms usually prefer short-term borrowing, the reason being that commercial banks are the major lenders and they do not encourage long-term loans. Up to 1994 firms did not rely on market based debt; in mid 1994 the government amended the Company Law to permit companies to raise debt directly from the market in the form of TFCs (Term Finance Certificates).

In a previous study on determinants of capital structure in developing countries including Pakistan Booth et. al. (2001) also pointed out in their study on that the use of short term financing is greater than long term financing in developing countries. Hence,

Leverage= Total Debt/ Total Assets

Independent Variables:

Tangibility of Assets (TG):

The asset structure plays an important role in determining the capital structure. According to Harris and Raviv (1990) and Titman and Wessels (1988), the higher is the tangibility of the asset, the better is the company liquidation value. In fact, the tangible assets are considered as collateral for the debt and in case of bankruptcy, they have higher value than the intangible assets (Jensen and Meckling, 1976; Myers, 1977; Abor, 2008). By pledging the firm's tangibles assets as collateral, the cost associated with adverse selection and moral hazard are reduced. Therefore a positive relationship between tangibility of assets and leverage is expected.

According to the static trade-off approach, firms with higher ratio of fixed assets serve as collateral for new loans, favouring debt. However, the Pecking Order Theory is of the view, as argued by Harris and Raviv (1990) that firms with low levels of fixed assets would have more problems of asymmetric information, making them issue more debt, since equity issues would only be possible by under pricing

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them. On the other hand, firms with higher levels of asset tangibility are generally larger firms that can issue equity at fair prices, so they do not need to issue debt to finance new investment. According to them, the expected relationship between asset tangibility and debt should then be negative. Asset tangibility is used as a proxy for agency costs or collateral. Since tangible assets are used as collateral, the large amount of them decreases the risk of lender suffering the agency costs of debt, like risk shifting. According to Agency theory, the higher the tangible assets, the more willing should lenders be to supply loans and leverage should be higher (Scott, 1977). And Yasir & Hijazi (2006) showed positive relationship of tangibility with leverage. Tangibility of assets is measured in this study as the ratio of fixed assets to total assets. Using total gross fixed assets rather than net depreciated value of assets makes sense as (i) different firms may possibly use different depreciation methods that may create unevenness in the data (ii) a firm can pledge an asset having a market value even if it has been fully depreciated, Yasir & Hijazi (2006). Hence,

Tangibility= Total Fixed Assets/ Total Assets

H1:

Therefore the first hypothesis is that ***a firm with higher percentage of fixed assets will have higher debt ratio.***

Size (SZ):

In the financial literature, there is no consensus on the impact of the company's size on the capital structure decisions and the nature of the relationship is still unclear. According to the Static Trade-off approach, the larger the firm, the greater possibility the firm has of issuing debt, resulting in a positive relationship between debt and size. Titman and Wessels (1988) argued that the larger companies are more diversified and have lower variance of their earnings, making them able to tolerate high debt ratios. Agency cost theory also expects positive relationship since larger firms can lower costs (relative to firm value) and risk in the occasion of bankruptcy.

With respect to the Pecking Order Theory, Frank and Goyal (2003a), and Rajan and Zingales (1995) argued that this relationship could be negative. Rajan and Zingales (1995) argued that the larger

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companies should have lower debt because of less asymmetric information. According to this theory, there can be a negative or positive relationship depending on firm size, and a negative relationship between the size and the leverage can be because the larger companies are more closely observed and they should be more able to issue equity. Following Rajan and Zingales (1995), a negative relationship between size and leverage of the firm is expected. The natural log of sales is generally used to proxy firm size. The use of the log of sales instead of sales is justified by the non-linearity between sales and size from some point onwards. So the size (SZ) of the firm is measured by the taking the natural log of the sales as this measure smoothes the variation over the periods considered.

Size= LN (sales)

H2:

Therefore the second hypothesis is that ***there is a negative relationship between size and leverage of the firm i.e. the bigger the firm, the lower will be the leverage level.***

Growth (GT):

Different measures have been used in the past for growth. The market-to-book ratio is used by Rajan and Zingales (1995) as a proxy for the level of growth opportunities available to the firm. This is in common with most studies, which tend to apply proxies, rather than valuation models to estimate growth opportunities (Bevan, (2000)). Rajan and Zingales suggested that one would expect a negative relation between growth opportunities and the level of gearing. This is consistent with the theoretical predictions of Jensen and Mekling (1976) based on agency theory, and the work of Myers (1977), who argued that, due to information asymmetries, companies with high gearing would have a tendency to pass up positive NPV (net present value) investment opportunities. Myers (1977) argued that due to the agency problems, firms investing in assets that may generate high growth opportunities in the future face difficulties in borrowing against such assets.

However, the empirical evidence regarding the relationship between gearing and growth opportunities is rather mixed. Titman and Wessels (1988), Chung (1993) and Barclay *et. al.* (1995) Rajan and Zingales (1995) and Shah and Hijazi (2004) found a negative correlation, whereas Kester (1986) and Yasir &

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Hijazi (2006) did not find any support for the predicted negative relationship between growth opportunities and gearing.

For the POT, there are two possibilities for the sign of this variable: one the one hand, firms with high growth opportunities would tend to keep their debt ratios at low levels so as to preserve their credit capacity when it becomes necessary (negative impact), and on the other hand, this growth requires investments which are usually made with the issue of new debt (positive impact). Fama and French (2002) named these two possibilities as the complex and simple versions of the POT, respectively.

The relationship is negative because of more usage of short term debt rather than long term debt, short term debt has negative relationship with leverage, Nejla and Sherine (2011). In Pakistan as the average firm size is small so short term financing is preferred more. Different research studies have used different measures of growth; like market to book value of equity, research expenditure to total sales measure and annual percentage increase in total assets (Titman and Wessels, 1988). Given the structure of data growth (GT) is measured as a percentage increase in total assets, as the data was taken from the State Bank of Pakistan publication which does not have information on annual stock prices and research expenditure of the listed firms (Yasir & Hijazi 2006). Thus a negative coefficient for growth is expected. Hence,

Growth= Percentage increase in Total Assets

H3:

The third hypothesis is that ***firms with higher growth rate will have less leverage***.

Profitability (PF):

The financial literature provides conflicting evidence on the relationship between the company's profitability and the company's capital structure. Profitability is a strong point of dissent between the two theories i.e. Pecking Order Theory (POT) and Static Trade-off Theory (STT). For the STT, the higher the profitability of the firm, the more reasons it will have to issue debt, reducing its tax burden. The more profitable companies are, in general, more able in tolerating high level of debt since they may be in a good position to meet easily and on time their financial obligations, therefore, they can easily add more

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debt in their capital structure (Peterson and Rajan, 1994). Also, agency theory supports this positive relation because of the free cash flow theory of Jensen (1986).

According to Myers and Majluf (1984), on the other hand, the companies have a pecking order in the choice of financing their activities and the relationship between the leverage and the profitably is negative since the internal funds are more preferred than the debt. Therefore, the STT and agency theory expects a positive relationship between profitability and leverage, whereas the POT expects exactly the opposite that is a negative relationship.

In previous studies, the measure of profitability used was operating earnings before interest payments and income tax (EBIT). But following Yasir and Hijazi (2006) profitability (PF) is measured as the ratio of net income before taxes divided by total assets because the data taken from the State Bank of Pakistan publication does not permit to calculate EBIT. Hence,

Profitability= Net income before taxes/ Total Assets

H4:

So the fourth hypothesis is that ***firms with higher profitability will have less leverage***.

Data Analysis Technique:

This study uses panel regression analysis and descriptive statistics for analysis purposes. Panel data analysis facilitates analysis of cross-sectional and time series data. The pooled regression type of panel data analysis is used. The pooled regression, also called the Constant Coefficients model, is one where both intercepts and slopes are assumed constant. The cross section company data and time series data are pooled together in a single column assuming that there is no significant cross section or inter temporal effects.

Panel data follows a given sample of individuals over time, and thus provides multiple observations on each individual in the sample. Panel data combines the features of time series and cross-section. It provides information on a number of statistical units for a number of years. Panel data usually provides the researcher a large number of data points, increasing the degrees of freedom and reducing the

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co-linearity among explanatory variables; hence improving the efficiency of econometric estimates. A Multiple regression model is used in this study.

Model of the Study:

The equation used for the regression model will be:

LG = β0 + β1 (TG) + β2 (SZ) + β3 (GT) + β4 (PF)

Where;

LG = Leverage

TG = Tangibility of assets

SZ = Firm Size measured by natural log of sales

GT = Growth

PF = Profitability

Results and Analysis:

1 Descriptive Statistics:

Table#1 provides a summary of the descriptive statistics of the dependent and independent variables used in the analysis. The data contains the 18 firms of Cement Industry listed on Karachi stock exchange from 2006-2010. Table 1 below provides summary statistics of the mean, standard deviation, minimum and maximum. The panel data analysis is done for observations of five consecutive years starting from 2006-2010. In this way, the sample of the study consists of 90 firm-year observations.

Table#1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Leverage	90	0.23213	1.13812	0.58791	0.17551
Tangibility	90	0.25115	1.55135	0.99560	0.24691
Size	90	0.00000	23.99399	2.15045	3.42977
Growth	90	-0.70738	8.47271	0.38459	1.00954

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Profitability	90	-0.24777	0.43828	0.010019	0.12421

The mean of leverage of firms was 0.58791 respectively. Tangibility measured as the percent of fixed assets to total assets had a mean of 0.99560 this indicates that, on average, fixed assets accounted for 99.56% of total assets of the firms sampled. While, size, determined as the natural logarithm of total sales had a mean of 2.15045. Growth, given as the ratio of the percentage change in total assets, registered a mean value of 0.38459 indicating a growth of 38.45 % during a five year period. Profitability, given as the ratio of pre-tax profits to total assets, registered a mean value of 0.010019 indicating a return on assets of 1.00% during a five year period. Table shows, there are minimum values that are less than zero because of inclusion of the observations that even contain negative figures in net income for calculating profit.

Regression Analysis:

Using pooled regression technique, regression test was done in order to check the effect of leverage (dependent variable) on independent variables; tangibility, size, growth and profitability of the firms of the Cement Industry with the aim to investigate what relationship these variables hold and whether these variables have significant explanatory power or not. The estimated results of 90 years data are reported through the following tables:

Table#2.1: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.640[a]	0.410	0.382	0.138009

R square and adjusted R square shows the summary of goodness of fit. The value of R square in the above table-2.1 is 41%. It suggests that size, profitability, tangibility, and growth show around 41% variation in the leverage. The remaining variability in the leverage is due to some other factors which are not included in the model. The R square of the Yasir and Hijazi (2006) was around 74% which shows that these variables are capable to show 74% variation on the leverage of the Cement Industry of Pakistan. In their

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paper, they have suggested that these variables are predicting the major effect on leverage. However, the result of this study shows less variation which means that with the passage of time the choice of capital structure of the firms of cement sector has changed and now it relies on some other factors too including these four variables. Adjusted R square is slightly below the R square.

Table#2.2: ANOVA[b]

Model		Sum of Squares	DF	Mean Square	F	Sig.
	Regression	1.123	4	.281	14.738	.000[a]
	Residual	1.619	85	.019		
	Total	2.742	89			

a. Predictors: (Constant), Profitability, Tangibility, Growth, Size

b. Dependent Variable: Leverage

ANOVA shows that whether the model selected for the study is fit or not. It is confirmed by the significance of the model. The last column of this table shows the goodness of fit of the model. The lower this number, the better the fit. So the significance shows that the model selected is good enough for this study. Form the value of the F-statistic it can be seen that the model is significant at 1% level of significance. DF stands for degree of freedom, it shows the size of sample, which in this case is 90.

Table#2.3: Regression Coefficients and their Significance

Model		Un-standardized Coefficients		Standardized Coefficients		
		Beta	Std. Error	Beta	t-statistic	Sig.
1	(Constant)	.468	.119		3.927	.000
	Tangibility	.187	.061	.264	3.096	.003

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Size	-.002	.004	-.047	-.553	.582
Growth	-.018	.015	-.102	-1.196	.235
Profitability	-.785	.120	-.555	-6.547	.000

a. Dependent Variable: Leverage

From table#2.3 it can be seen that two variables which are tangibility of assets and profitability are statistically significant at 1% level of significance while size and growth are found to be statistically insignificant in this study. The value of Beta shows the relationship of dependent variable with independent variables. From the above table it can be seen that leverage has a positive relationship with tangibility of assets and negative relationship with size, growth and profitability.

Interpretation of results:

Results obtained from the analysis for the four variables are interpreted and explained with reference to the capital structure theories and the relationship of leverage with independent variables is discussed and it is checked that which theory is supported by these four relationships of leverage. Three main theories of capital structure which are static trade-off theory, pecking order theory and agency theory are discussed in context with the results obtained from the regression analysis. The following table shows the expected and observed relationship in comparison with these three theories:

Table#3: Expected & Observed relationships in comparison with theories

Variable	**Definition**	**Static Trade-off theory**	**Pecking Order theory**	**Agency Theory**	**Expected & Observed Relationship with leverage**
Tangibility	Ratio of fixed assets to total assets	Positive	Negative	Positive	Positive

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Size	The natural Log of Sales	Positive	Negative	Positive	Negative
Growth	Percentage change in total assets	Negative	Positive(Extended) Negative (simple)	Negative	Negative
Profitability	Ratio of net income before income tax over total assets	Positive	Negative	Positive	Negative

Tangibility of Assets:

Tangibility of assets is seen to be positively related with leverage with a Beta =0.187. This finding is in line with the findings of previous studies such as Titman and Wessels, (1988) and Rajan & Zingales (1995). This result indicates that with a 1 percent increase in the firm's fixed assets, relative to total assets, there is 0.187 percent rise in leverage ratio of a firm. There is a strong significant relationship between leverage and asset tangibility at 1% level of significance. This positive relationship shows that a firm with the large portion of fixed assets can easily raise debt or obtains more debt at relatively lower rates by providing collaterals of these assets to creditor. The results thus favours the Meckling's (1976) and Myers' (1977) version of the trade-off theory that debt level should increase with more fixed tangible assets on the balance sheet. The results are also consistent with Yasir and Hijazi (2006). So this significant and positive relationship of leverage and tangibility supports the static trade-off theory and agency theory of capital structure. Therefore the first hypothesis is accepted at 1% level of significance.

Size:

According to the results, size is negatively related with leverage with a beta= -0.002. However the regression co-efficient is found to be statistically insignificant and it does not even lie on 10% significant

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level. Based on this insignificant result, no confirmation can be given whether there is a negative relationship between size and leverage or not. On these grounds, the second hypothesis is rejected that there is negative relationship between size and leverage of firms of cement sector. The result is inconsistent with Titman and Wessels (1988), Rajan and Zingales (1995) and Shah and Hijazi (2004) which shows the evidence of significant direct relationship between size and leverage. However if compared with the theories, so the direction of negative beta supports the pecking order theory, but due to its insignificance the hypothesis is rejected. Yasir and Hijazi (2006) also found the same insignificant relationship.

Growth:

According to the results, growth was found to be negatively related with leverage with a beta= -0.018. The relationship between leverage and growth in total assets is found to be negative, and is consistent with the predictions of static trade-off theory, simple version of pecking order theory and agency theory. This finding is also consistent with other studies including Rajan and Zingales (1995), Shah and Hijazi (2004). Yasir and Hijazi (2006) found a significant positive relationship. However the relation in this study proves to be statistically insignificant which makes the third hypothesis to be rejected. Though, the results obtained here show that there exists no relationship between expected growth and leverage that is of economic significance. A reason may be that the measure used here, the percentage change in total assets, does not reflect future growth possibilities only past growth. Thus, other more significant results might be obtained by using another measure for expected growth, for instance market-to book ratio, a commonly used proxy for expected growth. Also in the cement sector the relationship is negative because of more usage of short term debt rather than long term debt, short term debt has negative relationship with leverage Nejla and Sherine (2011). Thus the third hypothesis is rejected.

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Profitability:

According to the results, profitability is negatively related with leverage with a beta= -0.785. Profitability is also statistically significant on 1% so the last hypothesis is accepted that there is negative relationship between profitability and leverage. The results about the relationship between profitability and leverage are same as contributed by Shah A (2004) and also in line with the pecking order theory of Myers and Majluf (1984) for a 1 percent increase in the earnings before taxes, relative to total assets, the leverage ratio of firm will decline by about 0.785 percent. It implies that profitable firms in Pakistani cement sector maintain low debt ratios. This result is consistent with implication of Pecking order theory that firms prefer to finance first with internal funds before raising external financing. Further this outcome is also consistent and Titman & Wessels (1988) and Rajan and Zingales (1995). The same results were observed by Yasir and Hijazi (2006). Thus the last and fourth hypothesis is accepted.

Conclusion:

This study is basically an analysis on Cement Industry of Pakistan to measure the determinants of capital structure. As in the present study it can be seen that growth was found to have a negative relationship with the leverage, this is because of more usage of short term debt. If the growing firms in the cement sector uses more long term debt, their growth rate can improve and become positive with debt; that is the more the long term debt the more growth opportunities the firms will have. Firms in cement sector showed negative relationship of size with leverage in this and also in previous study. So if the firms become larger in size their debt ratios will also improve. Most of the firms in cement sector are small, so they should increase their size.

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ISSN 2076-9202

IMPACT OF LIVE STOCK IN GROWTH OF AGRICULTURE SECTOR AND GDP

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Introduction:-

Pakistan was primarily agriculture based country at the time of independence.Agriculture is back bone of our country and plays very important role in our daily life. Pakistan has great potential for producing all types of food product. Pakistan has very large and rich base of natural resources.Agriculture plays an important role in generating the growth of economy. The importance of agriculture can be measured in different ways:

- It provide food to the consumers
- Provide a market for industrial commodity
- Source of earning

Agriculture covers the largest sector of our economy. Majority of people directly or indirectly deal in it. It contributes about 24percent of our GDP.It is the large source of foreign exchange earnings. It is important for all rural and urban populaion.Planners are always keen to have reliable area and production statistics of agricultural crops well in time. Policy makers need accurate time for the importance of crops such as rice, grain, wheat and cotton etc.But recently due to persistent hikes in the prices many commodities have gained the economic growth. Our total geographical area is 79.6 millions hectares' out of which 27% is under cultivation. On this cultivated area,80% is irrigated. This shows that majority of the area of

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cultivation is irrigated. The growth shows very impressive growth in croppedarea, from 11.6 million hectares in 1947 and 22.6 million hectares' in 1997.In Pakistan the rainfall is not enough for the growth of agricultural crops, forest and fruit plants. Approximately 68 percent of geographical area has annual rainfall of 250mm whereas about 24 percent has 251 to 500mm.Only 8% of the area exceeding the rainfall of 500mm annually. Water is necessary for the good crops either from irrigation and through harvesting. Maximum agriculture area is depend upon artificialirrigation. In total cultivated area 17.58 million hectares is irrigated whereas crops production is 3.96 million hectares which mainly depend on the annual rainfall. Thecannal command area (CCA) has been divided into different classes on the basis water logging and salinity system.Recently,one fifth of the land is depend upon CCA While 2.8 million hectares' are suffering from sodicity.ThusPakistan needs to better its drainage system to reduce its cost and make it efficient.

AGRICULTURE IMPORTANCE FOR ECOMOMIC GROWTH:

As agriculture is an important part of our economy, it widely covers the majority of the area. The total area of Pakistan is 796096 squares kilometers. About which 70% lives in villages, so majority of the people deal in agriculture. Total workforce in 195051 of agriculture employed is 66% but by 1999 to 2000.While it drops to 47.3%.In pakistan,punjab is considered the best area for agriculture because of its good irrigation system and soil. Pakistan has two types of crops annually:RABI CROPS AND KHARIF CROPS.

The most important crops in Pakistan are:

- Pulses: provide good protein.
- Millets: grow in poor soil.
- Wheat: major need of country and important for health.
- Maize: mostly found in warm places.
- Rice: an important product and covers 4.3millions tons of rice.

Major cash crops are cotton,livestock,tobacco etc.In 1998,the population of Pakistan is 130 million but

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the annual addition of the population is 3.4 million.In 1947,thePakistan's population was 32.5 million and in next 50 years it has increasedtetrafold.Due to which, crops production has increased 2.9 fold only. Agriculture contributes 24% of GDP But it has declined gradually since the Pakistan come into existence from over 50% in 1949 to 50 to about 24% in 1996to 97.A major part of our economy depend upon the agricultural crops.Agriculture plays an Important part in the economic growth of Pakistan:

- Contribute 24% toward GDP
- Mean of export earning
- Provide food to millions people
- Providing employment
- Provide the source of livelihood to rural population

IMPORTED CROPS:The major agricultural import commodities are oil,pulse,tea and grain etc.It shows the 13.5% of the total import.

EXPORTED CROPS:On the total export earning ,share of primary commodities contribute almost 60% of the total export. Thereis some structural changes in it,but the agro.based product is more or less sustained its position. Livestock is the most important sub-sector of agriculture with national GDP contribution of 10.7 % and 49.5 % to the agriculture value added. Livestock also contributes significantly towards national exports and 8.5 - 9.0 % of total exports belong to this sector. This sector provides raw material for the industry and livestock creates market and capital. It serves as a social security for the rural poor who can cash it at the time of his/her need. Livestock also provides security against crop failure particularly in barani areas. Most importantly, livestock is raised by more than 6.5 million small and landless families in the rural areas constituting their main livelihood source. Thus it is an ideal sector for investment if one would like to address poverty alleviation in the most deserving areas i.e. rural set-up. Pakistan is endowed with a large livestock population well adapted to the local environmental conditions. Majority of national herd is maintained by small holders. The sector is confronted with many constraints and challenges. The demand for livestock products is increasing due to population growth, urbanization

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and economic development in the country. The current cumulative growth rate (2000-06) for livestock sector is 3.8 percent, with milk showing 3.0 % growth and meat 2.7 % in 2004-05. The demand for milk and meat is projected to grow by at least 5.0 % for milk and 6.5 % for meat in the coming years. This leaves a tremendous gap in supply and demand situation which can only be addressed by concerted and combined efforts of public and private sectors.

Question:-What is the impact of live stock (Milk) in growth of agriculture sector of Pakistan ?

Literature Review:-

Live stock is play major role in agriculture sector and GDP of Pakistan.Live stock and dairy contribute in our economy growth.

Salman MasoodSheikh, Mushtaq Ahmed (2012): Agriculture is important for economy to develop. In developing countries made their way from the agricultural sector's development and progress. Role of this sector realizes its importance all over the world. This sector is the backbone of the developing countries. In Pakistan major productions are agricultural productions. GDP of a country like Pakistan is affected by agriculture very much. The study shows that our country is not achieve a high level of GDP without agricultural improvement because agricultural sector play big role in our GDP. If we want to increase our GDP, Then our govtshould have to take steps to improve our agriculture sector.

M Younas and M YaqoobThe livestock sector is an integral part of agriculture in Pakistan. Livestock accounts for 37% of the agricultural GDP and about 9% of the total GDP. This is derived from a livestock population of about 25.5 million buffaloes, 23.8 million cattle, 24.7 million sheep, 54.7 million goats, and 5.4 million other animals (Economic Survey 2003-04). Based on the previous census 13.1 million buffaloes, 9.38 million cattle, 6.14 million sheep, 15.3 million goats, and 2.37 million other animals were found in the Punjab province.ABEDULLAH, N. MAHMOOD, M. KHALID AND S. KOUSER**,** Despite the speedy growth in the other sectors, agriculture is still the single largest sector contributing nearly 22%

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to the national income of Pakistan (GDP) and employing nearly 45% of its workforce. As much as 67.5% of country's population living in the rural areas is directly or indirectly dependent on agriculture for its livelihood (Government of Pakistan, 2008).

M Moaeen-ud-Din and M E BabarAgriculture is the largest sector of economy in Pakistan contributing 25% of GDP and employing 51% of the labor, while livestock and dairy contribute 43% to the agricultural GDP which is more than that shared by major crops. That the livestock sector is an important component of Pakistan's economy is evident from the fact that the value of milk produced alone exceeds the combined value of wheat, rice, maize and sugarcane crops in the country.

MUHAMMAD SARWAR,M. AJMAL KHAN AND ZAFAR IQBAL The livestock sector, the back bone of agriculture sector, is though a neglected sector in all respects but it still plays a vital role in our national economy by providing draught power, high biological value animal proteins and its byproducts (hides, skin, wool, mohair, bones and manure etc). Draught power and manure provided by the animal enhance the productivity and fertility of the land that is deficient in organic matter. More than 10 million heads of draught animals are engaged in agricultural activities.Agriculture contributes 25 percent to total GDP of Pakistan, employs 48 percent of the labor force and accounts for nearly 9 percent of the country's export earnings. Food products constituted 48 percent of household consumption expenditure (39 % in urban areas and 54 % in rural areas in 2001-02). Agro-based industries accounted for 64 percent of the total industrial production of Pakistan [Census of Manufacturing Industries (1995-96)]. The agricultural sector is thus a major determinant of the overall economic growth and well being in Pakistan. The reported growth rate in the agricultural sector during the 1990s according to the Government's statistics was a reasonable 4.6 percent. Yet, estimates of rural poverty based on the head count measure show an increase from about 25 percent in 1990 to 39 percent in 2001-02 [Economic Survey (2002-03)]. Clearly, the benefits of this agricultural growth did not translate into improved welfare for the least well-off segments of rural society.

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Amjad, Muhammad Saleem; (2009) In Pakistan Agricultural output is low due to small holdings, Old and traditionalmethods of farming, poor irrigation facilities, low or misuse of modern farm technology etc (Zuberi,1989).This results in small income and no saving or small saving. Therefore, it needs of time that creditagencies come up to help them in applying and undertaking the improved farm practices. Credit is animportant instrument that enables farmers to acquire commands over the use of working capital, fixedcapital and consumption goods (Siddiqi et al, 2004). Credit plays an important role in increasingagricultural productivity. Timely availability of credit enables farmers to purchase the required inputs andmachinery for carrying out farm operations (Saboor et al, 2009).After emergence of green revolution, there have been overtime changes in crop production technology, socredit requirements have increased for both inputs for crop production and farm. Livestock & Dairy sector has played a significant role in national economy and rural social system over the years by providing quality food and export earnings. Livestock sector contributes almost 50 percent to the value addition in the agriculture sector, and almost 11 percent to Pakistan's GDP, which is higher than the contribution made by the crop sector (47.4% in agriculture and 10.3% in GDP).investment.

Omer, Muhammad Afzal at April 2,(2012) AGRICULTURE PLAYS important role in the national economy of Pakistan, where most of the rapidly increasing population resides in rural areas and depends on agriculture for subsistence. Biotechnology has a considerable potential for promoting the efficiency of crop improvement, food production, and poverty reduction. Use of modern biotechnology has been introduced in Pakistan since 1985. The role of livestock sector in the rural economy of Pakistan is very critical as 30-35 million rural population of the country are engaged for their livelihood. Within the livestock sector, milk is the largest and the single most important commodity. Pakistan is the fifth largest milk producer in the world. The total value of milk produced is higher than the value of two major crops, that is, wheat and cotton. *LIVESTOCK SECTOR* occupies a unique position in the socio-economic development of Pakistan. It also plays an important role in the rural economy as supplementing family incomes and generating gainful employment in the rural population, particularly among the landless laborers', small and marginal farmers and women. About 30-35 million rural population is engaged in

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livestock raising, having household holdings of 2-3 cattle/buffalo and 5-6 sheep/goat per family which help them to drive 30-40 per cent of their income from livestock. Dairy, meat and poultry sector is a considerable major sector of livestock. Livestock contributes approximately 55.1 per cent to the agriculture value added and 11.6 per cent to the national GDP during 2010-12. Gross Value Added of the livestock sector at constant factor cost has increased from Rs 672 billion (2010-11) to Rs 700 billion (2011-12) showing an increase of 4.0 per cent as compared to previous year. Fisheries is a sub sector that plays a significant role in the national economy and towards the food security of the country as it relax the existing pressure on mutton, beef and poultry meat. Fisheries share in GDP is 0.3 per cent. Although the contribution is very small, it adds substantially to the national income via export earnings. A total of 84,498 million tons of fish and fish products were exported 2011-12 in Pakistan and major buyers are China, Thailand, Malaysia, Middle East, Sri Lanka, and Japan. Meat exports from Pakistan have recently grown due to heavy demand from the Middle Eastern countries like UAE, Saudi Arabia and Kuwait. In recent years, net foreign exchange earnings from livestock sector were nearly Rs. 51 billion, which accounted 11 per cent of the overall export earnings.(According to Economic Survey 20010-11)Backward agricultural sector contributes 20.9 % to GDP.Its growth rate is as low as 1.2 %.Employs the 45.0 % of total labor force contribution in exports (Food Group) is 8.62 %.

Problem statement:-

The world is facing the shortage of food day by day and the food resources are going to shrink. Pakistan is main country with sizeable population. This is mainly due to the crisis of food management. The food covers large categories however we are going to focus only one aspect of food, i.e Milk and its importance for agriculture. The research methodology used in our research is based on statistical testing using models that analyze the relationship of two variables. The variables that we are studying are Agriculture and Livestock (milk).The sample size data collected over a period of the last ten years from " economic survey of Pakistan". The dependant variable is Agriculture and independent variable is Livestock(Milk).

Research methodology:-

The research methodology used in our research is based on statistical testing using models that analyze the relationship of two variables. The variables that we are studying are Agriculture and Livestock (milk). The sample size data collected over a period of the last ten years from " economic survey of Pakistan". The dependant variable is Agriculture and independent variable is Livestock(Milk).

We used 10 years secondary data. All the data is taken from, Government of Pakistan Economic Survey.

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- 2009-2010
- 2010-2011 and 2011-2012
- We are going to observe the relationship of dependent variables with the milk and agriculture.
- After the data had been extracted from period of 2003-2012, we compiled it in Microsoft excel and using data analysis toolkit we started the statistical analysis.

Statistical analysis has been done through three major approaches.

1. Graphical Representation
2. Regression
3.

Year	Milk	Agriculture
2002-2003	27811	4.1
2003-2004	28624	2.4
2004-2005	29438	6.5
2005-2006	31970	6.3
2006-2007	32996	4.1
2007-2008	34064	1
2008-2009	35160	4
2009-2010	36299	0.6
2010-2011	37,475	2.4
2011-2012	38,690	3.1

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Regression:-

Regression involves the identification of the relationship between independent and dependent variables. We have used a simple linear regression model.The data set is the parameter values used to derive an estimated regression equation.

Interpreting Summary Output from Excel

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.448946616
R Square	0.201553064
Adjusted R Square	0.101747197
Standard Error	1.869679248
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	7.059396062	7.059396062	2.019451059	0.193080187
Residual	8	27.96560394	3.495700492		
Total	9	35.025			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	11.25101921	5.521271845	2.037758604	0.075937532	-1.481056489	23.9830949
X Variable 1	-0.000234598	0.000165085	-1.42107391	0.193080187	-0.000615285	0.000146089

Interpreting Summary Output from Excel

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Interpreting Summary Output from Excel

Regression Statistics	
Multiple R	0.448946616

Multiple R: The correlation between Y_i and $\hat{Y}_i$ is 44.89%

Linear regression equation

$$Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i$$

Yi = 11.25101921 + 0.193080187+□i

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Coefficient of Determination

$$r2 = \frac{\text{Regression sum of squares}}{\text{Total sum of squares}}$$

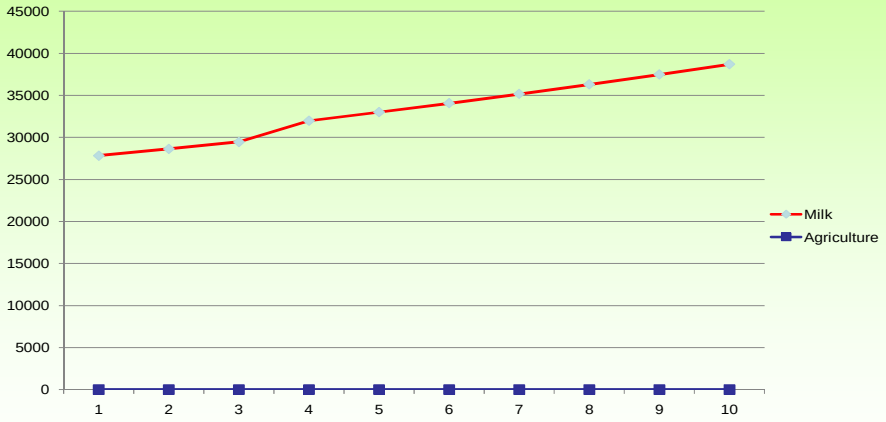
$$r2 = SSR/SST$$

So, $= 7.059396062/35.025$

$= 0.201553064$

13

Graphical Representation of Results



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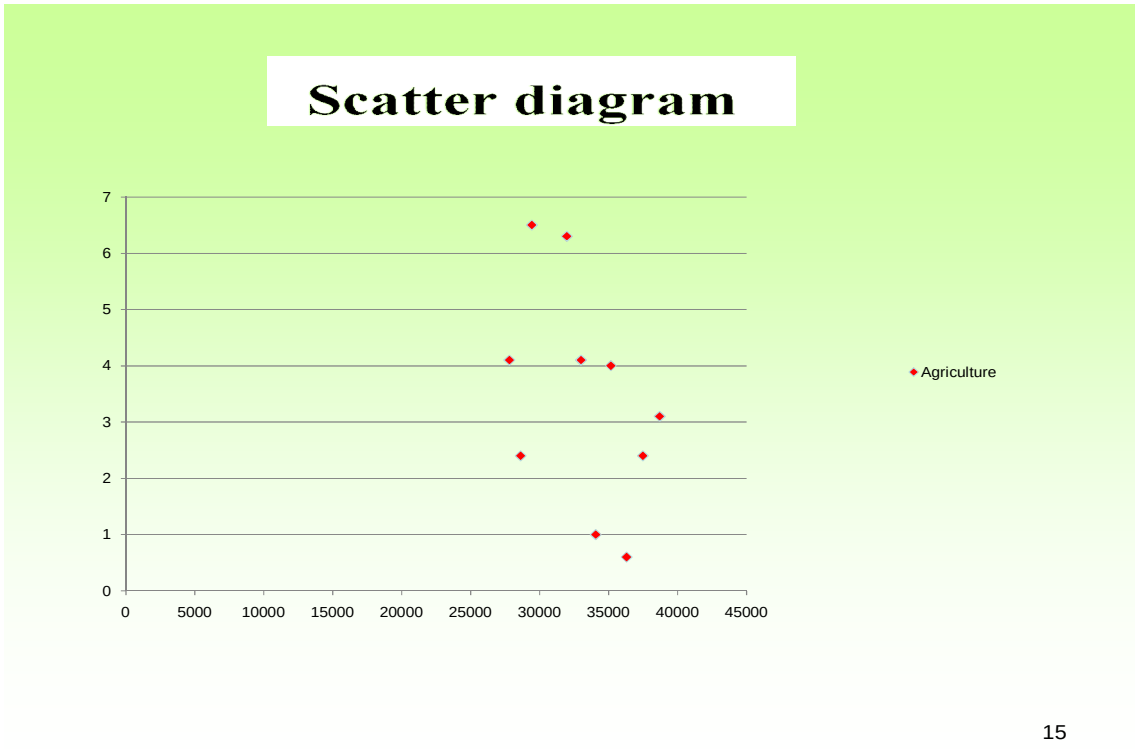

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Conclusion:-

There is Linear relationship between agriculture sector and milk production. However this relation is not strong relationship. In other words as the agriculture sector expands, the Milk production also increases reasonably or slightly and have no strong imapct.

- **Submission to**

International Journal of Advances in
Management and Economics (IJAME) **ISSN:2278-3369**

ISSN 2076-9202

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Acknowledgemt:-

All praise to Allah whose help has made possible the completion of this project for providing us the opportunity and the resources to do some creative job in our lives to prove our capabilities and skills. We would like to express gratitude to our Advisor **Sir Zakee Saadat** for his motivation and mentoring throughout the project. Without his timely, comprehensive and guided feedback, our study would have been difficult to accomplish. At the same time, I am really thankful to my brother Dr.Muhammad Jamil Alvi (P.hdPhysics) (Deptt.Of Physics COMSATS LHR) for their cooperation, the useful information provided by them to us, and also for giving us their precious time. Finally we would like to thank all UMT faculty and staff, our family and friends for their constant support and patience during the course of the project and at the end, we cannot ignore the role of secondary sources of information like internet that made us convenient to finalize our project report.

ISSN 2076-9202

Practicing Knowledge Management System

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Abstract:

The knowledge-based theory of the firm suggests that knowledge is the organizational asset that enables sustainable competitive advantage in hypercompetitive environments. The emphasis on knowledge in today's organizations is based on the assumption that barriers to the transfer and replication of knowledge endow it with strategic importance. Many organizations are developing information systems designed specifically to facilitate the sharing and integration of knowledge. Such systems are referred to as Knowledge Management System (KMS). The current study provides an analysis of current practices and outcomes of KMS and the nature of KMS as they are evolving in organizations. The findings suggest that interest in KMS across a variety of industries is very high, the technological foundations are varied, and the major concerns revolve around achieving the correct amount and type of accurate knowledge and garnering support for contributing to the KMS. Implications for practice and suggestions for future research are drawn from the study findings.

Keywords: Knowledge Management, Knowledge Management Systems, Organizational Learning, Organizational Use of IS

Categories: DD06, GA01, HAO9

"In post-capitalism, power comes from transmitting information to make it productive, not from hiding it."

Peter Drucker

The New Capitalism

I. INTRODUCTION

Information technologies designed to assist managerial and professional workers have evolved over several decades from systems focusing on processing and disseminating vast amounts of information to managers organization wide (MIS), to systems focusing on providing tools for ad hoc decision analysis to

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specific decision makers (DSS), to systems designed to provide updated, often real-time, relevant information to senior and middle managers (EIS). These systems have each contributed to individual and organizational improvements in varying degrees and continue to be important components of organizations' information technology investment. An emerging line of systems targets professional and managerial activities by focusing on creating, gathering, organizing, and disseminating an organization's "knowledge" as opposed to "information" or "data." These systems are referred to as Knowledge Management Systems (KMS).

The concept of coding and transmitting knowledge in organizations is not new—training and employee development programs, organizational policies, routines, procedures, reports, and manuals have served this function for years. For example, the McDonald's restaurant's operating manual captures almost every aspect of the restaurant management including: cooking, nutrition, hygiene, marketing, food production, and accounting. By capturing, codifying, and disseminating this knowledge, the company reduces the level of required know-how for its managers while improving the effectiveness and efficiency of its operations. What is new and exciting in the knowledge management area is the potential of using modern information technologies (e.g., the Internet, intranets, browsers, data warehouses, filters and software agents) to systematize, facilitate, and expedite firm-wide knowledge management.

The existing body of work on KMS consists primarily of general and conceptual principals of KMS (Davenport, 1997b) and case descriptions of such systems in a handful of bellwether organizations (Watts, Thomas and Henderson, 2011). Because KMS are just beginning to appear in organizations, there exists little research and insight to guide the successful development and implementation of such systems, or to frame expectations of the benefits and costs of such systems. Neither is it yet clear if KMS will experience widespread development and implementation across a variety of industries, nor if KMS are destined to be highly touted systems that quickly find themselves in desuetude as a passing fad. The current exploratory field work aims to contribute an understanding of the perceptions of knowledge management and knowledge management systems, both from the perspective of individuals in organizations with KMS as well as organizations without KMS. More specifically, the study identifies the technologies being used to build KMS, knowledge domains being incorporated into KMS, the champions of KMS initiatives, the desired benefits and expected costs of KMS, as well as the major concerns regarding KMS.

The organization of the paper is as follows: in the following section, knowledge and KMS will be defined. The third section will describe the methodology and the fourth will present the study findings. The fifth and final section will discuss the implications of the findings.

2. **KNOWLEDGE, KNOWLEDGE MANAGEMENT, AND KMS**

To define KMS, it is necessary to first define knowledge and knowledge management. Knowledge is a broad and abstract notion that has defined epistemological debates in western philosophy since the classical Greek era .1 Since this article has an applied (versus a theoretical or philosophical) orientation, we have adapted the following working definition of knowledge, based on the work of Nonaka (1994)

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and Huber (1991). Knowledge is a justified personal belief that increases an individual's capacity to take effective action. Action in this context refers to physical skills and competencies (e.g., playing tennis, or carpentry), cognitive/intellectual activity (e.g., problem solving), or both (e.g., surgery which involves both manual skills as well as cognitive elements in form of knowledge of human anatomy and medicine). The definitions of knowledge as found in information systems literature further make a distinction among knowledge, information and data. For example, Vance defines information as data interpreted into a meaningful framework whereas knowledge is information that has been authenticated and thought to be true. Mag,litta (1996) suggests that data is raw numbers and facts, information is processed data, and knowledge is "information made actionable".

While each conceptualization makes inroads into understanding differences in the three terms, they fall short of providing a means to readily determine when information has become knowledge. The problem appears to be the presumption of a hierarchy from data to information to knowledge with each varying along some dimension, such as context, usefulness, or interpretability. What we consider key to effectively distinguishing between information and knowledge is not found in the content, structure, accuracy, or utility of the supposed information or knowledge. Rather, knowledge is information possessed in the mind of an individual: it is personalized or subjective information related to facts, procedures, concepts, interpretations, ideas, observations and judgments (which may or may not be unique, useful, accurate, or structurable). We are basically positing that knowledge is not a radically different concept than information, but rather that information becomes knowledge once it is processed in the mind of an individual ("tacit" knowledge in the words of Polanyi (1962) and Nonaka (1994)) which then becomes information (or what Nonaka refers to as "explicit knowledge") once it is articulated or communicated to others in the form of text, computer output, spoken or written words or other means). The recipient can then cognitively process and internalize the information so that it is converted back to tacit knowledge. This is consistent with Churchman's (1972) conceptualization of knowledge and his statement that "knowledge resides in the user and not in the collection [of information]."

Two major points emerge from this conceptualization: 1- Because knowledge is personalized, in order for one person's knowledge to be useful for another individual, it must be communicated in such a manner as to be interpretable and accessible to the other individual. 2- Hoards of information is of little value: only that information which is actively processed in the mind of an individual through a process of reflection, enlightenment, and learning can be useful.

Knowledge management then refers to a systemic and organizationally specified process for acquiring, organizing and communicating both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work.

The major challenge of managing knowledge is less its creation and more its capture and integration (Grant, 1996; Davenport, 1997a). Indeed, knowledge is of limited organizational value if it is not shared. The ability to integrate and apply specialized knowledge of organizational members is fundamental to a firm's ability to create and sustain competitive advantage (Grant, 1996). Traditionally, knowledge creation and transfer has occurred through various means such *as face-to-face* interactions (planned or ad hoc),

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mentoring, job rotation, and staff development. However, as markets and organizations become more global and move to virtual forms, these traditional means may prove to be too slow and less effective and in need of being supplemented by more efficient electronic means. On the other hand, as Brown and Duguid (1991) note, knowledge will not necessarily circulate freely firm-wide just because the technology to support such circulation is available.

Indeed, studies on such technologies as LotusNotes have not shown a change in information sharing and communication patterns; rather, organizational members who tended to communicate regularly and frequently without LotusNotes communicated regularly and frequently with LotusNotes whereas members who communicated less regularly and less frequently before the implementation of Notes continued to communicate less regularly and less frequently (Vandenbosch and Ginzberg, 1997). Hence, in the absence of an explicit strategy to better create and integrate knowledge in the organization, computer systems which facilitate communication and information sharing have only a random effect at best. As a result, companies, particularly those which compete on the basis of services and expertise (e.g., management consulting and professional services firms), are beginning to implement information systems designed specifically to facilitate the codification, collection, integration, and dissemination of organizational knowledge (Alavi, 1997; Bartlett, 1996; Sensiper, 1997). Such systems are referred to as Knowledge Management Systems. The popular claims for the results of KMS are high and include the ability of organizations to be flexible and respond more quickly to changing market conditions, and the ability to be more innovative as well as improved decision making and productivity (Sata, 1997; Harris, 1996). To develop an understanding of the current practices and outcomes of knowledge management and the form and nature of KMS that are evolving in organizations, we undertook a descriptive study of perceptions and practices of KMS in fifty organizations from a variety of industries. We hope that the findings of this study will lead to insights that will guide early KMS initiatives in organizations and reduce failures and false starts. In addition, we anticipate that the results can help guide further research endeavors in the emerging area of KMS.

3. METHODOLOGY

A non-random sample of 109 participants was invited to participate in this study. The participants in the program represented a cadre of vanguard organizations that in the authors' view would represent companies with significant IT investments and thus would be likely candidates to have KMS under consideration/development or already in operation. The participants were asked to respond to the study questionnaire on an individual basis. The questionnaire, displayed in Appendix A, contained 13 questions consisting of short answers and multiple choice. The respondents estimated that it took them about 30 minutes to complete the questionnaire. A total of 50 usable responses were received for a response rate of 45.8 percent. The questionnaire tapped into the respondents' concepts and perceptions of KMS, their perceptions of the current levels of KMS activities in their firms, and their expectations of potential benefits and their concerns regarding these systems.

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4. STUDY FINDINGS

Figures 1 thru 3 depict the sample of respondents by their position, and their industry. Table 1 shows the current state of existence or development of KMS in the organizations represented in the sample. As can be seen in the three figures, the respondents represent organizational positions, and industries.

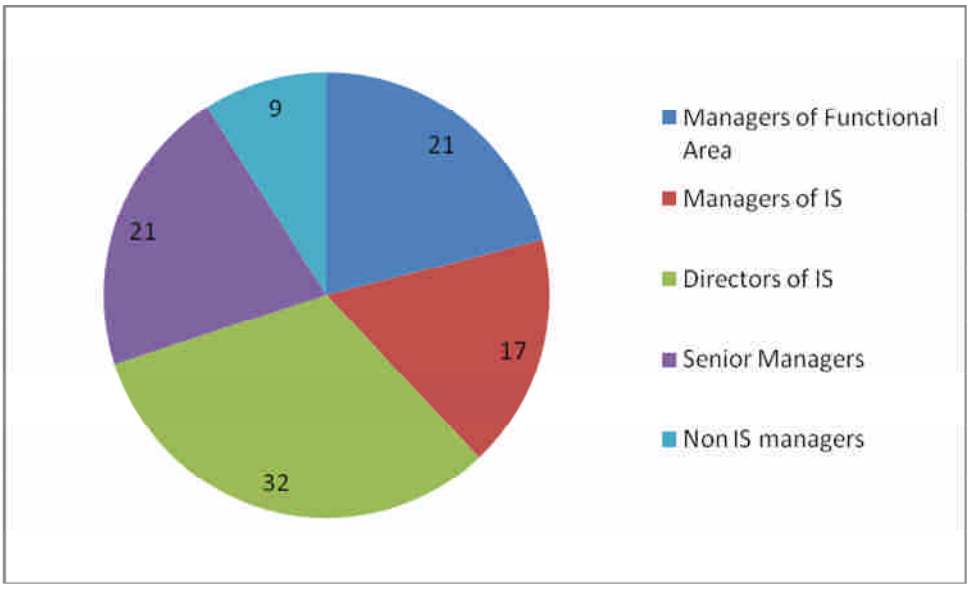
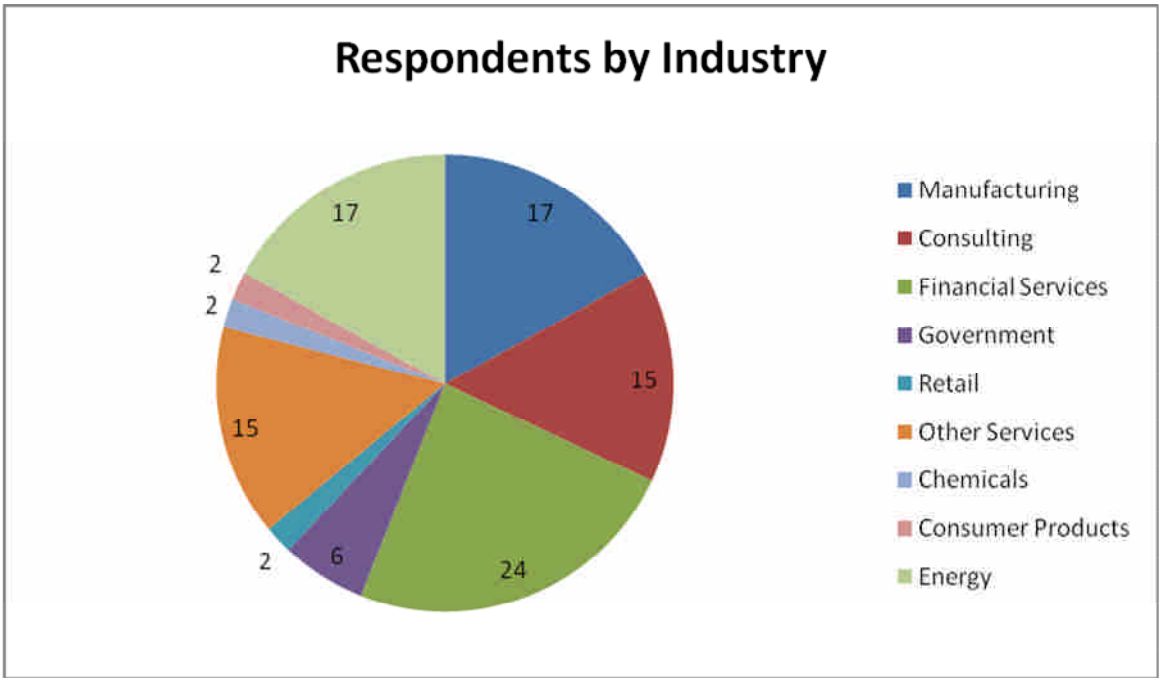


Figure 2: Respondents by Position



Have an existing KMS	27.27%
Currently developing a KMS	16.36%

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Considering developing a KMS	10.91%
Do not have a KMS	16.36%
Had not heard of KMS	29.09%

Table 1: Current Status of KMS existence and development

All respondents, regardless of whether they currently had or were developing a KMS in their organizations, responded to questions concerning their perceptions of knowledge management, the capabilities they believed necessary for effective knowledge management, and the key concerns they had about knowledge management. These are summarized in Tables 2 thru 4 and discussed below.

4.1 The meaning of knowledge management

The purpose of this question was to ascertain what managers consider the concept of knowledge management to be about. Three perspectives emerged: an information-based perspective, a technology-based perspective, and a culture-based perspective. In terms of the information-based perspective, managers reported thinking knowledge management to be about characteristics of information, such as readily-accessible information, real-time information, and actionable information. Some spoke in terms of free text and concepts being the information foundation of knowledge management. Also in terms of the information perspective, several managers mentioned their view that knowledge management was about reducing the overload of information by "filtering the gems from the rocks". There was an apparent concern with the extraordinary amount of information that can now easily be gathered and disseminated via information technologies. The managers expressed a desire to obtain competitive advantage from information itself (as opposed to associating competitive advantage with any particular information technology). Lastly, some managers thought very specifically of knowledge management as being a "corporate yellow pages" or a "people to people information archive". In other words, they viewed knowledge management *as a* means of keeping track not so much of knowledge itself, but **of who held** the knowledge and how to locate them. Knowledge was not distinguished from information or data, rather the words were evidently used interchangeably.

However, the managers were implicitly making a distinction between the terms. For example, one manager stated "one person's knowledge" is "another's data". This is consistent with the view that knowledge resides in the individual and that there are no inherent "objective" attributes that distinguishes between the two constructs. In terms of the technology-based perspective, the managers associated knowledge management with various other systems (including Data Warehousing, Enterprise Wide Systems, Executive Information Systems, Expert Systems, and the Intranet), as well as various tools (e.g., Search Engines, Multi-media, and decision making tools). More generally, participants suggested that knowledge management was about information technology infrastructure and more specifically, about the integration of cross-functional systems worldwide. There did not emerge a clear view of a new type of technology specifically dedicated to knowledge management. Indeed, this is consistent with the fact that

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knowledge management systems can be accomplished with sundry different technologies, the most effective of which would likely depend upon an organization's size and existing technical infrastructure.

Lastly, in terms of the culture-based perspective of knowledge management, managers associated knowledge management with learning, primarily from an organizational perspective, communication, and intellectual property cultivation. Some suggested that the information/technology component of knowledge management was only 20% of the concept whereas the cultural and managerial aspects accounted for the bulk of the issue. However, their responses were nebulous in terms of specific cultural implications, perhaps indicating a root concern absent concrete ideas on how to address it.

Information-based	**Technology-based**	**Culture-based**
Actionable information	Data Mining	Collective Learning
Categorizing of data	Data Warehouses	Continuous Learning
Corporate Yellow Pages	Executive Information Systems	Intellectual Property Cultivation
Filtered information	Expert Systems	Learning Organization
Free text and concepts	Intelligent Agents	
People Information Archive	Intranet	
Readily accessible information	Multimedia	
	Search Engines	
	Smart Systems	

Table 2: **Perspectives on the Meaning of Knowledge Management**

The responses were examined based upon whether the responding individual was from an organization with a KMS or not. However, there did not appear to be any major differences in the perceptions of KMS for the two groups, with the exception that individuals from organizations without KMS tended to offer technology-based responses slightly more frequently than individuals from organizations with KMS.

4.2 Knowledge Management Capabilities Needed

When asked what capabilities related to knowledge management that their organizations were in need of, the managers also tended to proffer three perspectives. In terms of information, they suggested the need for access to customer information, client information, competitor information, and product/market information. Several internal knowledge domains were also desired, including activity-based costing, human resource information, and up-to-date financial status. The technology capabilities desired included wider bandwidth, a consistent suite of e-mail and web-based products, search engines, intelligent agents, navigational tools, global IT infrastructure, interoperability of existing data systems, and fast retrieval. Lastly, the managers reported a need for practical guidelines on how to build and implement knowledge management systems and how to facilitate organizational change to promote knowledge sharing.

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Information-based	**Technology-based**	**Culture-based**
External:	Integrated databases	Teamwork
Client Information	Interoperability of existing systems	Practical guidelines
Competitive Information	Larger bandwidth	Knowledge Sharing
Customer Information	Global IT infrastructure	
Market Information	Intelligent agents	
Internal:	Consistent suite of email and web products	
Activity-based Costing	Navigational tools	
Financial Information	Fast retrieval	
Human Resources Information		
Product/Services Information		

Table 3: *Needed* Knowledge Management Capabilities

4.3 Key Issues Concerning Knowledge Management

When asked about the key concerns they had about knowledge management, the managers expressed concern primarily over the cultural and managerial issues and informational issues. In terms of the cultural issue, the managers were concerned over the implications for change management, the ability to convince people to volunteer their knowledge, and the ability to convince business units to share their knowledge with other units (particularly when each business unit was responsible for showing a profit). The managerial concerns related to the business value of knowledge management and the need for metrics upon which to demonstrate the value. There was concern about determining who would be responsible for managing the knowledge and of bringing together the many players involved in developing KMS, including technical staff; corporate librarians, documentation staff, archivists, database administrators, and the professionals with the knowledge. Concern was also expressed over how to effectively implement KMS.

Generally speaking, the managers expressed concern that knowledge management might be perceived by senior managers as just another "fad" and that the concept suffered from immaturity. Particularly those managers from organizations that had not yet implemented KMS expressed a need to better understand the concept and to be convinced that knowledge management "worked" before pursuing KMS.

The concerns related to information were primarily associated with a desire to avoid overloading already taxed users with yet more information. The concern was as much about the new information that would now be available as it was about eliminating "old/wrong data" or knowledge that was no longer valid. This supports Courtney et al's (1997) assertion that "omitting the unimportant may be as important as concentrating on the important" in determining what knowledge to include in KMS. There was also a mention of concern about customer and client confidentiality now that much information about customers

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and clients would be gathered and widely available in the organizations.

Lastly, several managers expressed some concerns over technological issues. These issues were related to technical infrastructure and the security of data on the Internet. More specifically, configuring an effective technical infrastructure and architectural requirements in the face of highly dynamic technology was reported.

Information
Building vast amounts of data into usable form
Avoiding overloading users with unnecessary data
Eliminating wrong/old data
Ensuring customer confidentiality
Keeping the information current
Management
Change management implications
Getting individuals to volunteer knowledge
Getting business units to share knowledge
Demonstrating business value
Bringing together the many people from various units
Determining responsibility for managing the knowledge
Technology
Determining infrastructure requirements
Keeping up with new technologies
Security of data on Internet

Table 4: Key Concerns Related to Knowledge Management

Information management "worked" before pursuing KMS.

4.4 Characteristics of KMS

For those respondents whose organizations had or were developing KMS, questions were asked concerning the initiator, the team members on the KMS project, the budget, the types of knowledge included, and the tools used. As is readily apparent in Figure 4, KMS are most commonly championed by senior general managers. This would be expected given that knowledge management as a concept is not directly tied to technology; rather emerging technologies provide a means of enabling more effective knowledge management. In terms of the KMS development teams, virtually all respondents providing information on the teams responsible for developing their organization's KMS indicated that directors from the business units as well as IS managers and staff comprised the team. Less consistency emerged on the individual responsible for the KMS. In some cases, respondents reported that the CIO was

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responsible for leading the KMS development team; in other cases, respondents indicated that a business unit director reporting to the CIO was responsible for the team.

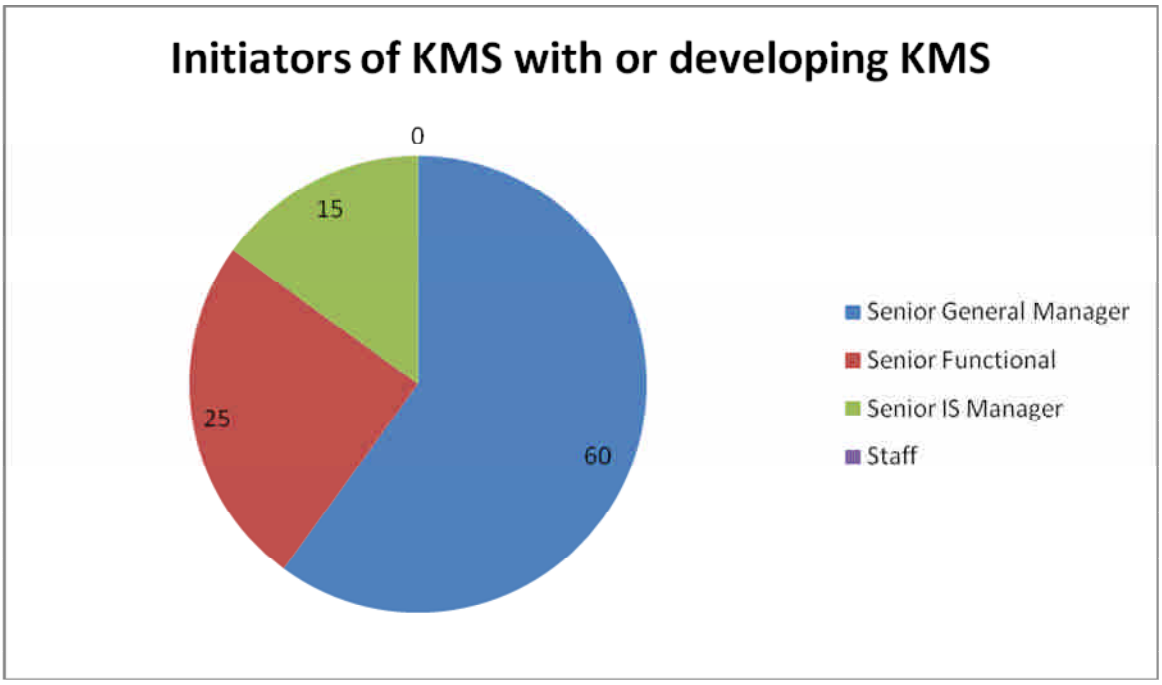

Figure 4: Initiators of KMS with or developing KMS

Figure 5 shows the estimated average budgets associated with KMS development. The lowest reported budget for a KMS was $55,000. The highest reported figure was $50,000,000. The wide range of estimated budgets may be attributed to several factors including the size of the organization, the current level of infrastructure, and the scope of the knowledge management initiative. In some firms, knowledge management is a firm-wide initiative involving upgrading the technical infrastructure, deploying workstations to professional staff desktops, developing and implementing large intranets, and implementing large-scale communication and groupware tools.

On the other hand, with the appropriate technology and information infrastructure in place, the average KMS development budget is substantially lower. For example, in a professional services firm that had already installed Lotus Notes, the cost of a knowledge management system for the engagement teams was limited to the cost of developing several Notes templates that the team then used to populate with the customer and project related knowledge created and shared through the engagement process. On the other hand, the estimated budget of KMS in another professional services firm was $50 million. This figure included the cost of content development, training, and overhaul of the technical infrastructure of the entire firm (hardware, software, and network acquisition and development cost).

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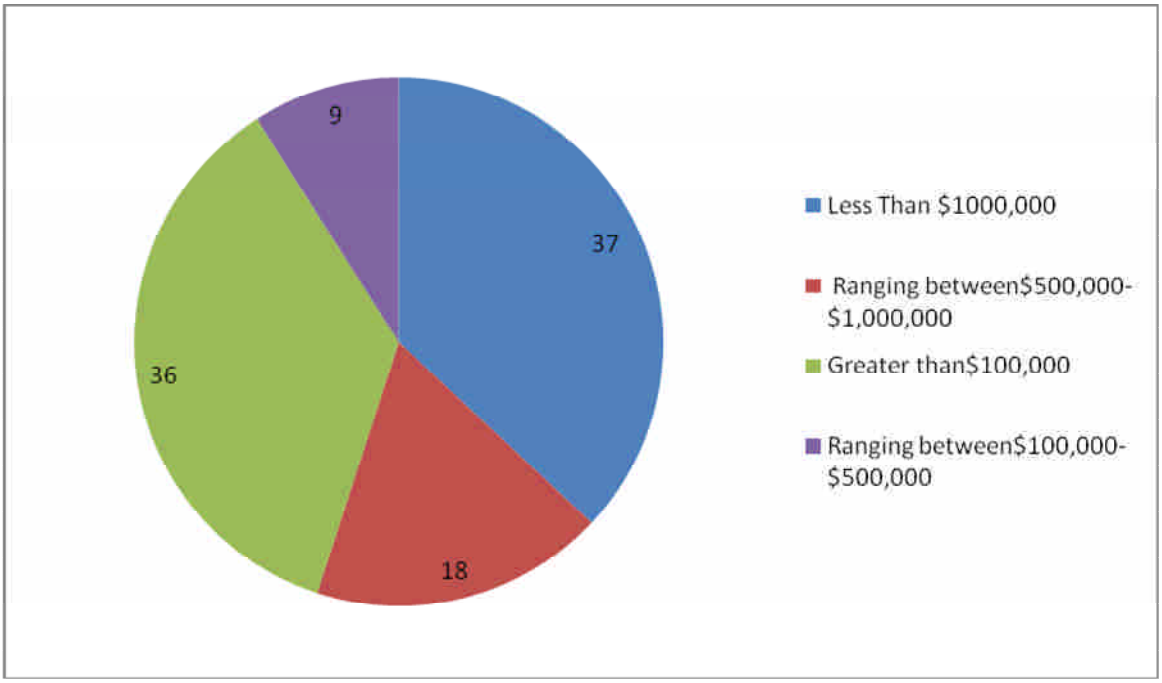

Figure 5: Estimated Average budgets of KMS in Organizations with KMS

Table 5 shows the technologies being used in KMS development. The Intranet seems to be the primary means of displaying and distributing knowledge in organizations with 90% of the organizations using browser tools. The other two most common tools are electronic mail and search/retrieval tools.

Browser	90%
Electronic Mail	84%
Search/Retrieval Tools	73%
Information Repositories	52%
WWW Server	42%
Agents/Filters	36%
External Server Services	31%
Videoconferencing	23%

Table 5: **Percent of** KMS **with Various Technologies/Tools**

Table 6 shows the importance of various types of information that may be included in knowledge management systems. Respondents answered on a 7 point scale with 7 representing the highest score. Respondents in organizations without KMS were also asked to rate the importance of the various domains of knowledge in their organizations even if they did not have technology designed to provide such knowledge. The most important knowledge domain for firms with and without KMS is knowledge on

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customer service. The second and third domains for firms with KMS were business partners and internal operations. For firms without KMS, the second and third highest domains were marketing/sales and business partners. For both groups, knowledge on suppliers was indicated as the least important domain of knowledge to be included in systems, perhaps reflecting the large percentage of service oriented firms in our sample. Overall, external sources of information tended to be rated highly.

	Firms with or Building KMS	Firms with no KMS
Customer Service	5.14	6.15
Business Partners	4.83	5.00
Internal Operations	4.62	4.95
Competition	4.57	4.90
Marketing/Sales	4.57	5.30
Suppliers	4.56	4.26
Human Resources	3.94	4.72

Table 6: Importance of Knowledge Domain (maximum of 7）

4.5 Perceived Benefits of Existing KMS

The respondents who reported that their organizations currently had or were currently developing KMS expressed that the KMS were designed to achieve both process results and organizational outcomes. The process improvements involved shortening the proposal time for client engagements, saving time, improving project management, increasing staff participation, enhancing communication, making the opinions of plant staff more visible, reducing problem solving time, better serving the clients, and providing better measurement and accountability.

These process improvements can be thought of as either relating to communication improvements or efficiency gains. The process improvements then, in the minds of the managers, led to cost reduction of specific activities, increased sales, personnel reduction, higher profitability, lower inventory levels, ensuring consistent proposal terms for worldwide clients, and marketing related outcomes (i.e., better targeted marketing, locking-in customers, and what one respondent termed "proactive marketing"--approaching clients "for solutions to problems they don't even face."). Thus, the perceived organizational benefits of KMS can be thought of primarily as being of a financial, marketing, and general nature (see Table 7).

Process Outcomes	**Organizational Outcomes**
Communication:	***Financial:***
Enhanced communication	Increased sales

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Faster communication	Decreased cost
More visible opinions of staff	Higher profitability
Increased staff participation	
	Marketing:
Efficiency:	Better Service
Reduced problem solving time	Customer Focus
Shortening proposal times	Targeted Marketing
Faster results	Proactive Marketing
Faster delivery to market	
Greater overall efficiency	***General:***
	Consistent proposals to multinational clients
	Improved Project Management
	Personnel Reduction

Table 7: **Perceived Benefits of Existing Knowledge Management Systems**

The data suggests that these practitioners did not value knowledge management for the sake of knowledge as an end in itself, but only when it was perceived to lead to desirable organizational benefits. This is consistent with King's view that knowledge should make a difference in some way " ... materially, aesthetically, or spiritually" (King1993, p. 80).

5. DISCUSSION AND CONCLUSION

5.1 Discussion

Several observations can be drawn from the data:

(1) KMS is not just for consulting and professional services firms2. Traditionally, management consulting and professional services firms have been considered knowledge-intensive firms and therefore interested in knowledge management and KMS. For example, almost all the Big Six accounting and consulting firms have created internal KMS over the past few years. Our survey revealed, however, that interest in KMS goes far beyond professional services firms and a broad range of organizations from a variety of industries are looking into this area, feeling that they can potentially benefit from KMS.

(2) Knowledge management systems are multi-faceted. That is, effective knowledge management systems involve far more than just technology, encompassing broad cultural and organizational issues. In fact, effective resolutions of cultural and organizational issues were identified as major concerns in the deployment of KMS. This is consistent with the IT management literature which advocates organizational and behavioral change management as critical success factors in the implementation of information systems (Alavi, 1992). Firm-wide KMS usually require profound cultural renovations. This is because traditionally, organizations have rewarded their professionals and employees based on their individual performance and know-how. In many organizations, a major cultural shift would be required to change

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their employees' attitudes and behavior so that they willingly and consistently share their knowledge and insights. An effective way to motivate knowledge sharing is through the organizational reward and incentive mechanisms.

(3) It is important to try to develop metrics to assess benefits of KMS. Although none of the organizations participating in the survey had conducted (or were planning to conduct) formal cost-benefit analysis for their KMS, the respondents felt that development of meaningful metrics for measuring the value, quality and quantity of knowledge is a key factor for long-term success and growth of KMS. To this end, knowledge management initiatives should be directly linked to explicit and important aspects of organizational performance (i.e., customer satisfaction, product/service innovations, time to market, cost savings, competitive positioning and market shares, etc.). In other words, organizations need to find leverage points where enhanced "knowledge" can add value, and then develop KMS to add value through delivery of the required knowledge.

(4)Integrated and integrative technology architecture is a key driver for KMS. No single and dominant technology tool or product for KMS emerged in the survey. KMS seem to require a variety of technological tools in three areas: database and database management, communication and messaging, and browsing and retrieval. The need for seamless integration of the various tools in these three areas may lead to the dominance of the Internet and internet-based KMS architectures. For example, the knowledge domains identified as valuable by both organizations with and without operational KMS in this sample (e.g., customers and business partners) had an external focus. Thus, the Internet and internet-based technologies and service providers play a key role in development of KMS by providing cost-effective access to the external knowledge domains. At KRBL Ltd., a participant organization in our survey, some of the files from external sources (e.g., the Gartner Group's weekly analyst report files and customer data files) are imported to the firm over the Internet using FTP.

Since access to internal organizational knowledge sources was also rated relatively high and desirable by our sample, we predict that organizational intranets will also play a dominant role in support of internal knowledge management activities due to cost-effective technical capabilities including: access to the legacy systems, platform independence, providing access to multimedia data formats, a uniform and easy-to-use, point-and-click interface, and capability for easy multi-media publication for knowledge sharing.

(5) Knowledge in the context of KMS is perceived to constitute a new form of information not previously addressed in other systems such as **MIS, DSS,** and EIS. The respondents in the survey implied a distinction between information and knowledge, although they seem to have used the words interchangeably. This was implicit in their discussions of a potential for creating a condition of cognitive overload due to an over-supply of information, and the desirability of providing access to people with knowledge (e.g., corporate yellow pages), rather than the information itself. This is consistent with the view held by some of the participants who had linked knowledge management to organizational learning processes. If we broadly view learning as the process of internalizing and converting information to

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knowledge, these two perspectives seem to support the view that information is the raw material for knowledge, and that more information does not necessarily lead to enhanced knowledge creation and sharing. This insight is very important for the designers of KMS for the following reason: simply delivering or "pushing" information (or even pre-filtered information) to the users' desktop may not be an effective knowledge management strategy due to the scarcity of user attention required for processing this information and converting it to knowledge. That is, in addition to the provision of the necessary information (the raw material for knowledge creation), the individuals should also be motivated to convert it to knowledge (i.e., learn and internalize the information). Hence, knowledge is created and shared on the basis of "pull" by individuals and not a centralized technology-enabled "push" of information to desktops (Manville and Foote,1996).

5.2 Conclusion

The study has provided a description of emerging issues and practices of Knowledge Management Systems. While the respondents were not drawn from a random sample of organizations or industries and while the number of respondents was relatively small, their views do represent a range of industries and organizational levels. The study was not intended to build or test theory but does offer some insights into needed and relevant research in the area of KMS. One useful line of inquiry entails an exploration of KMS-culture fit. Much has been made of technology-structure alignment, but the success of KMS may be more related to organizational culture than to organizational structure as evinced by the concerns of our respondents on getting knowledge sharing accepted in their organizations. Another useful line of research would consider methods of making users active contributors to KMS. The very label of "user" is somewhat inappropriate in the context of KMS as users are both contributors and beneficiaries of the system. Involving users in design is not sufficient: they must be involved in the consistent maintenance of KMS. A third potential line of research suggested by the study would uncover the decision making process for determining what knowledge to include in KMS.

Since a major concern of our respondents was avoiding too much information, it is worth asking at what point knowledge may stifle rather than enhance performance. Finally, an important line of research will consider the issue of KMS benefits. Given the primarily external focus of information contained in KMS, it is likely that outcomes experienced should involve enhancing relationships with external entities (such as customers and business partners). Studies that include the views of an organization's external entities might shed light on the actual benefits of KMS. The research on these topics (determining the relevant knowledge domains and obtaining business payoffs from KMS) may benefit from a focus on the possible links between knowledge and a firm's strategy and an explicit re-examination of competitiveness from a knowledge resource perspective. To make information resources productive, they should be converted to actionable knowledge. Such a process introduces challenges relating to knowledge creation, capture, sharing, and maintenance. The study suggests that knowledge management benefits will only be realized by organizations that are not only technologically adept, but that make the long term investment to align the cultural, managerial and organizational elements for knowledge management.

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Appendix A

Knowledge Management (KM) Questionnaire

Instructions: Please answer the questions to the best of your knowledge. There is no right or wrong answer. I am interested in your opinion on the issues.

1. **How would you describe your industry(circle the best answer)**

Extremely Stable **Extremely Unstable**

1 2 3 4 5 6 7

2. **In a professional (as opposed to a personal) context, what things come to mind when you think the concept of "Knowledge Management" Please list words or phrases.**

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_____
_____
_____
_____

3. What would you consider the most needed KM capability (products/services) in your organization?

Type of KM capability **User group needing the capability**

a._____ _____
_____
_____
_____ _____

b. I do not know.

4. What questions/issues/concerns are on your mind regarding KM?

_____
_____
_____
_____

5. In general, knowledge sharing and learning are valued in my company culture.

Strongly Agree			**Neutral**			**Strongly Disagree**
1	**2**	**3**	**4**	**5**	**6**	**7**

6. Please circle as many answers that are applicable:

a. We have completed at least one KM project in many company (If more that one, how many? _____)

b. We are currently in the process of working on a KM project.

c. We have not started on any KM projects, but we are considering it.

d. We do not have a project and are not even considering KM.

e. I had never heard of KM before today.

Please elaborate on your answer(s) above.

_____
_____
_____

Please Note: If you circled choice a and/or b above, please answer the questions in Part A below. If you circled choice c, d, and/or e above, please answer the questions in Part B.

Part A ((Please complete Part A if you circled a and/or b to question 6).

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7. In your opinion, what specific and tangible business results are targeted by the KM project(s) in your company?

a._____

b._____

c._____

d,_____

e. I do not know

8. In your estimate, what is the average development budget of KM projects in your company?

a._____

b. I don't know.

9. Rate the importance of the following knowledge domains for your company (circle a number between 1 to 7).

	Very Low					Neutral Very High
Marketing/Sales	**1**	**2**	**3**	**4**	**5**	**6** **7**
Customer Service	**1**	**2**	**3**	**4**	**5**	**6** **7**
Competition	**1**	**2**	**3**	**4**	**5**	**6** **7**
Internal Operations	**1**	**2**	**3**	**4**	**5**	**6** **7**
Human Resources	**1**	**2**	**3**	**4**	**5**	**6** **7**
Suppliers	**1**	**2**	**3**	**4**	**5**	**6** **7**
Business Partners	**1**	**2**	**3**	**4**	**5**	**6** **7**
Other (Specify____)	**1**	**2**	**3**	**4**	**5**	**6** **7**

10. The KM project(s) in my company was initiated by:

a. Senior level general management (CEO, COO, CFO, Senior VP, etc.)

b. Senior functional managers (e.g., director of marketing, or operations)

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c. Director of IS function

d. Staff members (specify)_____
e. Other (Specify)_____

11. The KM project leader in my company is (title and functional area):_____

12. List the title/functional area of the full-time KM project team members.
a._____
_____
_____
_____
b. I don't know.
13. Please underline the technical components of your KM system (please specify the products for each category b through i that you circle.)

a I do not know
b. Browsers (e.g., Netscape, Microsoft)
c. Search and retrieval tools (e.g., Verity, Open Text)
d. Agents/Filters (e.g., IBM's Info Market, General Magic's Typescript)
e. E-mail and groupware systems (e.g., Lotus Notes)
f. WWW server/communication software (e.g., Netscape's Collabra)
g. Repositories (e.g., Legacy systems, LAN-client server applications)
h. External server services
i. Videoconferencing
j. Other (specify)

You have now completed the questionnaire. Thanks for your time and cooperation.

Part B (Please complete Part B if you circled c, d, and/or e to question 6).

14. In your opinion, what specific and tangible business results should be targeted by the KM project(s) in your company?

a. _____
b. _____
c. _____
d. _____

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e. I do not know.

15. In your opinion, what should be the average development budget of KM projects in your company?

a._____

b. I do not know.

16. Rate the importance of the following knowledge domains for your company (circle a number between 1 to 7).

	Very Low					Neutral Very High
Marketing/Sales	**1**	**2**	**3**	**4**	**5**	**6** **7**
Customer Service	**1**	**2**	**3**	**4**	**5**	**6** **7**
Competition	**1**	**2**	**3**	**4**	**5**	**6** **7**
Internal Operations	**1**	**2**	**3**	**4**	**5**	**6** **7**
Human Resources	**1**	**2**	**3**	**4**	**5**	**6** **7**
Suppliers	**1**	**2**	**3**	**4**	**5**	**6** **7**
Business Partners	**1**	**2**	**3**	**4**	**5**	**6** **7**
Other (Specify____)	**1**	**2**	**3**	**4**	**5**	**6** **7**

17. In my opinion, KM projects in my company should be initiated by:

a Senior level general management (CEO, COO, CFO, Senior VP, etc.)

b. Senior functional managers (e.g., director of marketing, or operations)

c. Director of IS function

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d. Staff members (specify)

e. Other (Specify)

18. In my opinion, the KM project leader should be (specify the title and functional area)

19. my opinion, the KM full-time project team members should come from these ranks/functional areas:

_____

_____

_____

_____

You have now completed the questionnaire. Thanks for your time and cooperation.

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