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# **Management Review:** **An International Journal**

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## **Parameterizing Decision Factors on Centralization of Software Testing Organization: A Practitioner's Perspective**

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## ABSTRACT

*This paper is a practitioner's view of impact of different parameters like Centralization, Offshoring, Productivity Improvement, Quality and other process improvement on Return on Investment calculation for a CTO (Centralized testing Organization). This analysis can help IT QA(Quality Assurance) management to quantify Return on Investment from different parameters of operation and decide on where to invest for optimum benefit. Return on Investment is one the critical factors that any large / small organization chooses before investing. At all the stages of the project life cycle, Return on Investment calculation is a must - that is at business requirements to design , development, testing and implementation phase. In today's world, independent testing has become very important. The organization needs to do a proper due diligence on selecting testing model, process, time to market, cost etc. For these the organization needs to understand the criteria for selecting the right model for testing which gives the maximum return on investment. This study analyses different parameters and their impact on Return on Investment. This paper does not elaborate on how to establish a CTO. Rather this is an attempt to quantify results after due consideration of various focus areas like - lower cost of operation by offshoring and centralization and savings through Productivity Improvement thru Automated Test Case Execution, savings through Process and tools standardization etc. to implement different parameters within a CTO. The findings are based on authors' experience of implementing CTOs for reputed clients and implementing that across big size portfolios. The constraints for pure development projects, product testing projects or open system projects may vary in nature. For example scope and benefit from automation may be very high for product testing*

*projects or open system projects but not so for legacy mainframe based maintenance projects.*

**Keywords:** Centralized Testing Organization, Return on Investment, Productivity, Off shoring

## INTRODUCTION

General trend in the IT industry is moving towards setting up of dedicated Testing Center for the organization, focusing on maximizing ROI(Return on Investment). Maturity of testing centres that spans from out sourcing for Staff augmentation, Project level testing support to Enterprise or LOB Testing Center of Excellence. Only 5% of the organizations have setup “Centralized Testing Organization”, that provides support at enterprise or LOB(Lines of business) level (Mohapatra et al., 2012). Very few organization have achieved full potential of CTO in terms of centralized spending on infrastructure and resources while maintaining consistent objective testing scope of testing.

There are a couple of Critical Success Factors for establishing a CTO. Clarity of objectives viz. short, medium and long term goals should be clearly set up upfront. Also Senior Leadership level commitment and alignment is absolutely essential to percolate the philosophy down.

For setting up CTO another important factor is the Amount and Type of Investment which is required. Most important of it all is People – for which hiring/sourcing right set of people to build and deploy the enterprise level QA strategy is required. For Processes- Sponsorship is required to build a common framework and the consulting effort to deploy it across the enterprise. Infrastructural Investment for labs, test environment, test

management and other testing tools is essential. Also necessary is the proper Governance for a Test Management Organization to run and critical funding to be decided.

There are very important Key Business Metrics for a successful Implementation of a CTO. Reduction in IT(Information Technology) support costs (due to better quality) is the primary one. Other important outcomes to be measured are Improvement in on-time delivery of projects (cycle time) and reduction in time-to-market (due to efficiencies). Finally there should be reduction in Cost of Quality due to better Defect Management.

All these post facto things become important after establishing the CTO. However it is of primary importance for the organization in knowing the parameters upfront on the basis of that they can take an informed decision whether to go for it or not and if yes, what kind of return they expect on that. Authors have tried to delve into these practical scenarios after undergoing literature available on the topic.

## **PROBLEM DEFINITIONS AND OBJECTIVES OF THE STUDY**

Test managers typically do return on investment calculations on different programs and solutions but struggle to show ROI of an entire test organization and more so for getting funds for establishing a CTO. This paper focuses on understanding of different parameters of CTO (Centralized Test organization) that are considered for effort savings and productivity improvements across testing organization leading to better ROI. Test managers often struggle to identify parameters which should be emphasized for getting the best out of an CTO. The salient features of a CTO which must be considered before developing the most cost effective and result oriented model are listed below in the methodology section to analyze ROI calculation of Centralization of

Software Testing Organization based on understanding of parameters and their impact on effort savings and productivity improvement.

## **OBJECTIVES OF THE STUDY**

- To understand the parameters affecting Centralization and offshoring of testing organization
- Impact of the Parameters on effort savings and productivity improvement

## **METHODOLOGY**

The primary authors work as senior managers of testing units at leading Indian IT service provider organization, responsible for managing large portfolios for multiple clients. There was direct involvement of the primary authors in software development supervisions, productivity monitoring, quality assurance and testing. This opportunity of corporate exposure enabled in understanding the real scenario and also to collect data on best practices. The current paper is based on firsthand experience of authors in implementing and running CTO for multinational corporations which run world class QA organizations.

*Sampling Design:* The representative methodology and illustrative numerical figures have been used from the best practices of multiple CTO experiences mentioned in the data collection section below. To present a mathematical model of the problem we needed per unit effort and cost of several parameters which are taken from Industry Standard Reports on testing industry trends. For each parameter simple average for 3 yrs of operations are taken for 4 CTOs running for more than 3yrs. Though the value of individual parameters may vary from



organization to organization, the underlying principle of Return on Investment remains same.

Based on literature review, gaps observed and data, it comes out ample clear that following parameters need to be examined for realizing how each of them can contribute to increase in effort savings and productivity improvement.

*Increasing offshoring*-Optimizing effort and cost by moving work to right skilled low cost places

*Centralized testing*-Maximizing the productivity and synchronization through consolidating various arms of testing existing within the organization

*Increasing automation*-Scenarios and processes, if automated improve efficiency and productivity across

*Standardization of tools*- Synchronizing the silos which increased the presence of amplitude of tools for the same kind of work

*Standardization of test processes*- Various LOBs/functional areas using their own set of processes which can be standardized

*Competency uplift*- In the knowledge based industry, retention, reuse and distribution of knowledge is of paramount importance which can add to every aspect of efficiency within

## **DATA COLLECTION AND ANALYSIS**

The benefit measurements are taken from data observed and collected for the four major implementations done for CTO by the authors. They are customers for the authors for more than 5

years. The implementations were for major insurance, healthcare and banking clients spread across the globe. All these were major transformation programs for the clients who have budget of more than 100 MUS\$ for IT every year. Each of these clients are having more than 1000 person months budgeted every year only in testing. Their offshoring percentage vary in the range of 30% to 80%. The productivity, process, automation and tool related data are consolidation of 151 projects across 17 portfolios for the period 2009 to 2012.

After shortlisting the four cases discussions were held with senior managers and delivery managers for the clients and the respective projects for revalidating the data points.

As mentioned above the portfolios and projects were fairly large and the size of applications developed was more than 1000 Function Points for each project. The criteria was essential to ensure that projects were characteristically similar so that all the interpretations and analysis were based on those results. The profile of clients for the data collected for four primary CTOs under study are outlined below.

The first company for which data has been collected is of one of the leaders in healthcare insurance in USA which provides coverage for medical, dental, pharmacy, group life, and disability insurance. Currently it operates in 50 states in USA to provides a full spectrum of healthcare insurance products and services to more than 31 million members. Also has overseas operations in UK , Saudi Arabia and China. It has done pioneering work on various programs like as case management, disease management and patient safety programs to provide best in class services at affordable cost. Currently it is a leading player in adopting ICD10 procedure and diagnosis codes for all its operations and establishing Accountable Care Organization in USA.

As vendor partners authors have been leading testing portfolio of the above mentioned health insurance provider with total IT budget more than 300M USD . The organization runs a Quality Assurance organization for more than 15 years which has been converted to an CTO with current budget close to 100M USD. Authors have been part of the CTO for more than last 5 years and have direct supervision and control of around 45% project under entire CTO. On an average 50 projects and 200 small enhancements are executed by authors team (peak team size 480) in a year. The projects were executed in global delivery model which has more than 80% effort offshored and achieved defect removal efficiency more than 95%. As the authors parent organization operates at CCMi Level 5, a fair number metrics are collected in granular detail for all projects. Starting form effort spent by individual resources on each project to size of the project in terms of no of Test cases and Test Unit, % of cases automated are systematically recorded and reported at various level of management. Organization maintains detail account all employees' domain experience and trainings attended to look at the project quality in light of resource quality. As projects were executed under a fixed price contract the vendor organization has flexibility to closely evaluate the staffing need based on centralized staffing model. For bench marking the results of various parameters under study in this paper authors have evaluated the project and metrics reports of 50 large projects in 2011-2012 with minimum 1000 FP. The outliers which had results at either extreme end were removed from calculating average and bench marking the results.

The other company for which data has been collected is part of a European based Insurance Group, which is a global financial institution with 112,000 employees providing services to 60 million clients in over 50 countries. The Client provides retail and

institutional clients with products and services in retirement services, annuities, life insurance, employee benefits, mutual funds, financial planning, reinsurance and institutional markets. It also offers a broad array of financial products and services in insurance, asset management and direct banking through a wide variety of products, from traditional equity and fixed income to alternative assets. The Client holds top 10 rankings in its major product lines and serves more than 14 million customers across the USA.

CTO has been successfully implemented in the company which has peak size of more than 100 testing personnel with approx 80% of offshoring. The IT budget of the company exceeds 100 MUSD and has more than 1100 PM of testing work every year. They could increase their Automation percentage to 30% and maintained more than 6% Productivity improvement year on year. Their major focus was to optimize Testing Governace through synchronization of their shared services. The spread was through their four portfolios and more than 35 projects were in execution.

The third data point was taken from one of the largest direct provider of life insurance in USA. They work in various technology areas including Mainframe,, Unix, Java, Dot Net, Data warehouse, IBM DB2, 3rd Party products like Siebel, JDE, 3rd Party testing tools. They receive the best possible insurance financial strength ratings from the all major companies that rate insurance providers: A.M., Best Ratings, Standard & Poor's Moody's Investors Service. This reflects their financial strength, overall operations efficiency, claims-paying ability and the soundness of their investments.

The association of author with their testing services group has helped in revalidating the parameters in discussion for CTO. The company has more than 150 MUSD of IT Budget. 46 Projects

across their 5 portfolios had more than 125 testing professionals. More than 1500 PM of testing effort per year was being budgeted. With 70% of offshoring they had various areas of improvement in terms of cost savings through CTO. After implementation they maintained 7% of Productivity improvement and could achieve 30 % of automation apart from going deep into standardization of Processes and Tools.

The other company considered for analysis is a leading wealth management company with more than 3.4 million customers and 3,500 employees in Australia and New Zealand. It provides services in the area of Wealth Management: Retail Superannuation, Corporate superannuation, Pensions/annuities, Retail investment, Fixed term annuities, Wealth Protection / Insurance: Group risk, Individual risk, Lifetime annuities, Mature and Banking: Mortgages and Deposits. Also helps in Capital Investment through investment in Australian equities, International equities, Fixed interest, Infrastructure, Private equity and Property. In Australia it is #1 in Superannuation business, #2 in Retirement Income management and #3 in Retail Managed Funds.

The company has implemented Centralized Testing organization. The IT spend of the company is 125 MUSD. They have more than 100 folks working for their testing services. They run more than 20 large Projects simultaneously in 3 portfolios with their large transformation program. They involved TPI for their Testing Center of Excellence assessment. After the implementation their savings percent went as high as 20% which included increasing their offshoring percentage from 30% to 60% and implementing standard tools and knowledge management practices across their testing organization.

## **Analysis of CTO Parameters:**

### **Increase offshoring**

To mitigate risk in the cost, logistics and availability of expertise at the onshore location it's essential to increase offshoring of testing projects. For this a proper pre-planning, process alignment, research of the local economy, finding the right vendor, inspection of the infrastructure, customization of training on cultural differences need to be considered. Across clients we have seen the maximum offshore resource ratio increase up to 80% of the total testing resource in the organization.

The cost advantage of offshore billing gives significant benefit to the overall cost of operation. To bring out maximum benefit from vendor the various contracting methods followed for e.g. Time and Material, Fixed Price, Managed Service or Shared Service contracts and lately output based contracts. Onshore/offshore Demand Planning leads to cost reduction due to low cost of offshore resources. The savings can be calculated based on following simple formula.

$$\text{Savings} = \text{Total Effort} * (\text{Targeted Offshore\%} - \text{Current offshore\%}) * (\text{Onsite billed rate} - \text{offshore billed rate})$$

*The offshoring percentage in many situations can go upto as high as 90%.*

### **Centralized testing**

Maximum utilization of test resources can be achieved by centralization of the resource pool testing and managing assignments efficiently. From our experience the cost benefit of centralization seemed to achieve saturation at one level and its benefit has been capped at 10%. In our view mainly specialized roles can be considered for centralization, SMEs roles are found not suitable for this as they are typically less in number.

Specialized roles like configuration lead and infrastructure lead could be reduced to an extent based on overall numbers. Some amount of reduction in non-specialized roles is also considered and is applied in the proper order – Tester, Test Analyst and Project manager.

It has been observed that Cross utilization of resource to optimize resource utilization leads to the savings in the range of 6 to 10%.

Note: Offshoring and Centralization need to go hand in hand. The number of full time employees deployed by the organization which are optimized by offshoring needs to be further analyzed from centralization perspective. The vendor offshore roles are the ones that need to account for offshoring additions (from offshoring view) and adjustments owing to reduction in the centralization view. The offshore vendor count and non-specialist roles like project manager, test analyst and tester are calculated using an optimized ratio (in the span of 1 is to 10).

### **Increased Automation**

Primary aim of Automation is reducing manual effort and increasing quality by removing human errors. It's important to do a thorough feasibility and Return on Investment study of automation proposal before investing in any technology or human resource in automation. Automation can be considered for both new script development and maintenance of existing scripts. In our experience regression test bed were found to be more suitable for automation to achieve substantial saving and increasing confidence. The major bottle neck faced in the projects are i) Maintaining data consistency in different regions of testing and different testing cycle ii) Stability of the targeted application, core applications which undergoes frequent changes are not suitable

for automation. It's observed that an agile or accelerated automation approach could be taken for dynamic and new application but the cost benefit analysis doesn't look promising.

This leads to savings in terms of Reduction in Test Scripting Effort, which ranges from 2% to 5% of overall scripting effort. Also Reduction in execution effort is in the range of 10% to 40% of overall test execution effort. These two combined together come in the improvement range of 2%-4% of overall testing effort.

### **Standardization of tools**

Use of different tools by different vendors for the same purpose in different parts of the organization increases overhead and total cost of operation significantly. It is very important to select the tools at organization level that will be used in the various lifecycle stages of the project. Typical tools that can be used in a testing project are available from various vendors for Test Management, Automation, Configuration Management, Performance testing etc. The primary benefit of having standardized tools across organization is it reduces redundancy of tools training, purchase/license cost maintenance, data storage and retrieval and report reformatting. This can help in increasing the ROI significantly.

The observation in number of projects shows that the effort reduction on overall testing effort due to deployment of tools (Test Management, Automation, Configuration Management, Performance testing etc.) is from 3% to 5% due to reduction in rework and increased reuse across all stages of test life cycle.

### **Standardization of test processes**

Well defined entry exit criteria and detailed process for all lifecycle stages of testing reduces communication overhead and minimizes error. Defined metrics for Quality and productivity



improvement makes it easier to track progress and benefits of the project.

There are various best practices which come out very clearly in terms of defining document template for all artifacts (e.g. Building skeletal scripts for each LOB-Lines of Businesses- helps a lot in reducing scripting effort), defining estimation model for e.g.SMC(Simple/Medium/Complex) / TUM(Test Unit Method) / FP(Function Point) etc., Establishing Early Validation Processes (Early Defect detection will result in significant cost savings in terms of relative cost of fixing defects 1:10:100-Design : Test : Production), defining Data Strategy and also Risk Based Testing approach can be done significantly through Orthogonal Array Approach to achieve maximum code coverage with optimum number of test cases.

The observation on effort reduction is quite evident across various organizations as mentioned below.

Table1. Area and Observed Result

	Area	Observed Result
1	Test case writing and execution productivity improvement	1.5-2% Over all prod Improvement
2	Root cause analysis and defect prevention+ Increase in Defect Removal Effectiveness (Pre-production)+ Quality (Decrease in No of Production Defect) Improvement	1%-2% Over all prod Improvement
3	Effective Change Management Procedures	0.5%-1% Over all prod Improvement
4	Process Standardization & Consistency (All Life cycle stages)	1.5%-2% Over all prod Improvement
	Total savings	5-7% Overall productivity improvement

### **Competency uplift**

Till today Knowledge management remains a challenge to many large organizations. A successful organization needs variety of skills and competencies like domain, technical, testing and management. Quantitative Measurement of competency is a difficult task. In the project we managed doing quantitative competency gap analysis followed by a development plan helped in improving project Return on Investment.

Few best practices followed in various organizations/projects go a long way in improving overall productivity and reducing the number of defects. Some of them like developing testing competency heat map for the organization, defining SME (Subject Matter Expertise) level based on number of years of experience, identifying niche training needs, establish expert certification as their exit criteria, establishing reusable artifact repository like skeleton scripts for different LOBs and developing policy for periodical assessment of artifact validation with team knowledge verification processes make the organizations more predictable and robust.

Proper Knowledge Management in a centralized testing organization is a great asset as it not only adds business value to testing but also helps in increasing the Defect Removal Effectiveness (Pre-production) and Quality (Decrease in No of Production Defect) Improvement due to much better knowledge of the talents and their development as Subject Matter Experts which leads to Overall Productivity Improvement in the range of 1 to 3%.

## DATA ANALYSIS AND RESULTS ON COST SAVINGS FOR THE TESTING ORGANIZATION

Based on the parameters and data points the following illustration shows how the parameters described can lead to overall range of savings for a testing organization of a company for the benefits envisaged above.

Table2. Brief description of parameters

a)	Increased Offshoring	
a)	Centralize Testing	Leverage synergies across Lines of Business
b)	Consolidate	Consolidate management/specialist roles
a)	Increase Automation	Scripting and Execution Efforts reduction
b)	Standardization of tools	Across organization for various testing tools
c)	Standardization of Test Processes	Standardize test process adherence
		Introduce advanced testing techniques
		QC Standardization
		Enforce Gating process
d)	Competency Uplift (Domain, Technical, Testing, Project Management and Soft Skills)	Analyze Gap
		Define Roadmap
		Train & Uplift

To start calculating ROI in terms of investment and effort savings with productivity improvements let us assume the onshore and offshore rates for the testing resources for the ease of calculation.

**Table3. Testing Billing Rate**

Testing Billing Rate		
Blended Rate (Average of Offshore and Onsite Rate)	\$50	Per Hour
Average rate - Offshore	\$30	Per Hour charged by Service Provider
Average rate - Onsite	\$70	Per Hour charged by Service Provider

This is the illustrative rate charged by Service Providers, which has been taken as base for calculation for showing reduction in cost.

**Current State of the testing Organization**

The following calculation is for the current state of cost of the testing organization which will help in calculating the effort savings and the productivity improvements later.

**Table4. Current State and Remarks**

Current State				Remarks
Total Testing Employees	Client	Service Provider		
	Onsite	Onsite	Offshore	
200	50	50	100	Cost (No. of Persons*Billing Rate from Table 3*12 months*180hrs/month)
Total Employees	200			Total Number of Employees including Service Provider and In house
Total Onsite	100			\$15,120,000 (No. of Persons* Onsite Billing Rate from Table 3*12 months*180hrs/month)
Total Offshore	100			\$6,480,000 (No. of Persons*Offshore Billing Rate from Table 3*12 months*180hrs/month)
Total Service Provider Employees	150			Total Number of Employees of Service Provider

Overall Onsite %	50.00%	Total Employees at Onsite/Total Employee
Vendor Onsite %	25.00%	Total Service Provider Employees at Onsite/Total Employees
Annual Cost	\$21,600,000	Sum of Total Onsite Cost + Total Offshore Cost

**Only Offshoring-**

Based on current state of organization if the organization decides to increase offshoring from 50% to 65%, the immediate cost reduction can immediately been seen in terms of cost reduction. This is a time tested method on the premise of which offshoring has increased worldwide. Offshoring increase percentage varies on comfort factor and experience of the organization with the Service Provider. The cost saving after doing the offshoring only without reducing the total number of staff is illustrated below:

**Table5. Cost Saving By Offshoring**

Current State				Remarks
Total Testing Employees	Client	Service Provider		Offshoring increase percentage varies on comfort factor and experience of the organization with the Service Provider
	Onsite	Onsite	Offshore	
200	35	35	130	Cost (No. of Persons*Billing Rate from Table 3*12 months*180hrs/month)
Total Employees	200			Total No. of Employees including Service Provider and Inhouse
Total Onsite	70			\$10,584,000 (No. of Persons* Onsite Billing Rate from Table 3*12 months*180hrs/month)
Total Offshore	130			\$8,424,000 (No. of Persons*Offshore Billing Rate from Table 3*12 months*180hrs/month)
Total Vendor Employeeyes	165			Total Number of Employees of Service Provider

Overall Onsite %	35.00%	Total Employees at Onsite/Total Employee
Service Provider Onsite %	17.50%	Total Service Provider Employees at Onsite/Total Employee
Annual Cost	\$19,008,000	Sum of Total Onsite Cost + Total Offshore Cost
Cost Saving	\$2,592,000	Cost Before Offshoring from Table 4 - Cost after offshoring
Cost Saving %	12.00%	(Cost Saving/Cost Before Offshoring from Table 3)*100

### Savings of the organization based on Centralization

From the data collected and the experience we have the cost benefit of centralization seemed to achieve saturation at one level and its benefit has been capped at 10%. In our view only specialized/domain experience/niche roles can be considered for centralization. Following is the cost saving based on Centralization over and above offshoring as both Centralization and offshoring go hand in hand.

Table6. Centralization and offshoring

Current State				Remarks
Total Testing Employees	Client	Service Provider		Centralization optimizes the synergy to the level of 10%, resulting in approx 10% staff reduction
	Onsite	Onsite	Offshore	In this illustration Total Testing Employees reduces by 10% from 200 to 180 and accordingly other nos also reduce
180	31	31	119	Cost (No. of Persons*Billing Rate from Table 3*12 months*180hrs/month)
Total Employees	190			Total Number of Employees including Service Provider and Inhouse
Total Onsite	62			\$9,374,400 (No. of Persons* Onsite Billing Rate from Table 3*12 months*180hrs/month)
Total Offshore	118			\$7,646,400 (No. of Persons*Offshore

		Billing Rate from Table 3*12 months*180hrs/month)
Total Vendor Employeeyes	150	Total Number of Employees of Service Provider
Overall Onsite %	32.63%	Total Employees at Onsite/Total Employee
Service Provider Onsite %	17.22%	Total Service Provider Employees at Onsite/Total Employee
Annual Cost	\$17,020,800	Sum of Total Onsite Cost + Total Offshore Cost
Cost Saving	\$1,987,200	Cost after offshoring from Table 5 - Cost after offshoring
Cost Saving %	9.20%	(Cost Saving/Cost after Offshoring from Table 5)*100

There are multiple factors that influence productivity and each of these are addressed over a period of time. Workforce stability and successful implementation of productivity improvements take total elapsed time of typically 3 years. The model allows viewing cost benefits owing to different levels of productivity improvement by changing percentage improvement derived from various initiatives(factors) as mentioned in the below table. These figures are completely based on the experience of the authors and the data from implementing the CTO in various organizations.

Table7. Factors Influencing productivity

Sl No	Factors Influencing productivity	% Improvement over 3 years	Range of Improvement
1	Increased Automation	3%	2%-4%
2	Standardization of tools	4%	3%-5%
3	Standardization of test processes	6%	5%-7%
4	Competency uplift	2%	1%-3%
	Total % Improvement over 3 years	15%	

	Annualized % Improvement for Calculation	5%	3%-7%
Note:	Realization of benefits from each factor will have its own elapsed time. All the Ranges taken from section 'Analysis of CTO parameters		

Final Calculation considering Overall Cost Savings and Productivity Improvement taking into account of investments likely to be made can give the Annual Return on Investment or Savings. The investment calculation can be done based on the current status of gap in Tools and Process Deployment and also per person investment required for transitioning the work from Onsite to offshore or from client employee to vendor/Service Provider employee. Following is the summary from the above calculation and which also includes tentative considerations of investments.

Table8. Summary from Calculation and Investments Options

Factors	% Savings	Savings	Remarks
Offshoring	12%	\$2,592,000	Cost Savings From Table 5
Centralization	9%	\$1,987,200	Cost Savings From Table 6
Productivity Improvement Measures	5%	\$1,080,000	Savings Percent from Table 7 * Annual Cost from Table 4
Investment in Transition and Training	2%	\$504,000	Transition from client for 8 weeks per person for client side staff reduction at onsite from table 5 (Cost (No. of Persons*Onsite Billing Rate from Table 3*180hrs/month)
Investment on Tools and Process Deployment	3%	\$540,000	Depends on current existing Tools and Process deployment and varies from 1% to 4%
Total Savings	21%	\$4,572,000	For Calculation Purposes, All Parameters (Offshoring + Centralization + Productivity Improvements - Investments) will be applicable in the first Year. From Second Year onwards only productivity Numbers will be considered as savings.



## **RESULTS AND LIMITATIONS**

Though theoretically optimization up to 100% is possible for any parameter, out of experience we cap the benefit of offshoring and centralization to max 25%. Productivity improvement is capped at 11%-19% in 3 yrs. As these figures have been observed practically, it can be recommended as a base to run through what kind of benefits companies can observe if the guidelines are followed. This was a major gap observed by authors while implementing multiple CTOs.

There are some factors which might limit the amount of improvement desired. The cost of standardization of Tools and Processes depend on a lot of factors like organizations current state and readiness, the technology and nature of project constraints and the test manager's ability to exploit full potential of CTO. For example automation tools for projects involving latest technology may not be available. Projects which are compliance (compliance to Govt. laws) in nature sometime cannot be offshored or outsourced. All these parameters have to be considered holistically before putting the numerical figures to calculate Return on Investment and calculate impact of any parameter.

## **PRACTICAL IMPLICATIONS**

Till now there are still many IT organizations (more than 50 %) which do not have centralized testing organizations. While attempting to implement CTO there is need to understand the different parameters impacting it and their current state and their impact to overall benefit in terms of Return on Investment. The study above will help the organization to attack different

parameters individually and model their own CTO for deriving maximum benefit from the investment done in CTO.

It is of immense importance because cost reduction and efficiency are the burning needs for Software arm of any entity and testing being almost one third of the cost of Software Development life cycle need to work through the measures elaborated above.

### **FUTURE SCOPE OF WORK**

Senior Management in Testing Organizations of a company can further analyze their operations more at microscopic level on the mentioned parameters to have better insight into issues and further detailed calculation of ROI. Few parameters which every CTO must study in detail are – Savings due to improved quality (reduced defects) and time (reduce time to market). The factors that will be considered to evaluate quality are overall Defect Injection Rate in terms of effort, defect injection Rate in terms of size, Defect Removal Effectiveness (Pre Production), total Number of Defects Injected per year, Total UAT Defects (Identified by business client), total Number of Defects escaped(Post production escaped defects).

Another area of study which could result from this study is to analyze on similar lines the synchronized effort of Development, Testing and Production support work and how processes and knowledge in various domains can be optimized with the above approach for reducing cost and increasing productivity. There can be feasibility of Centralized Development Organization and Centralized Production Support Organizations on similar lines as above. Removing inefficiencies of Agile working is another area where similar analysis can be undertaken.

## **SUMMARY**

Outcomes of this paper can be used by the software testing governance team as performance benchmark while planning on developing CTO (Centralized testing Organization) for their organization or showcasing the business value of testing to their Executive leadership thru Productivity and savings calculations. More importantly this paper gives an insight in to impact of multiple factors on the decision for establishing an optimized testing value for the organization, when all the factors are worked upon together or separately, like offshoring and centralization done together, making productivity improvement decisions, maximizing their automation effort and making informed investment decisions on standardizing tools and processes.

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## Understanding Organizational Change Into Entrepreneurship: A Theoretical Frameworks and Integration

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### ABSTRACT

*This qualitative study is to examine the process of organizational change into new entrepreneurship such as corporate spin-offs or intrapreneurship. In the study, the organizational change process is divided into two phases; Change initiation and change diffusion and key issues that should be considered in the future studies are suggested. In change initiation process, individual change agent are the change initiators who are responsible for identifying opportunities, realizing need for change and taking action. In change diffusion procedure, five different contextual factors are to be considered: (a) organizational environment, (b) change inertia or momentum (c) international and cultural atmosphere (d) resistance or receptivity to change and (e) time, sequencing, rhythm or pace. Then change initiation and diffusion processes are integrated into a single theoretical framework.*

***Keywords:*** Organizational Change, Entrepreneurship, Spin-Off, Intrapreneurship, Change Agent, Contextual Factors.

## INTRODUCTION

Changes in organizations happen all the time. Whether it is internally or externally identified, the ceaseless reformation of organizational activities has always been occurred and will be. The strategic change of firms has been one of the very promising research topics in organization studies attracting diverse scholars from various backgrounds (Armenakis, 1999; Haveman, Habinek, & Goodman, 2012; Rajagopalan & Spreitzer, 1997; Sorensen, 2007; Stuart & Sorenson, 2003; Stuart & Ding, 2010). However, some of the analytical issues in the organizational change literature need more attention to fill in the gaps.

Although greater interests elicited the number of researches in terms of organizational change, the integrative study of has not been done in the literature. The antecedents and the consequences have evolved from very micro to macro perspective as well as meta-analytical conceptualities tapping wide variety of organizational variables. Each side of perspectives has taken divergent directions and it led to massive amount of distinctive literature on each streams. Yet, there has not been an integrative study of different perspectives overarching the divaricated streamlines of theories.

Additionally, contextual factors of entrepreneurship setting are hardly considered in the organizational change literature (Pettigrew, Woodman, & Cameron, 2001). Traditionally the field of organizational change is far from understanding effect of entrepreneurial attempts. Rather, dynamics of organizational change has been limited to existing firms changing into another

firm in the same industry or niche, rather than creating new ones. This limited consideration of organization change within a single market or industry has made literature neglect the phenomenal changes from one organization to another organization for new industry, at times, if possible, with newly made organizations such as spin-off companies.

To understand corporate change from one organization to another is of great importance because the process generally entails high organizational outcomes for both parent firm and child firm (Semadeni & Cannella, 2011). In particular, for a child firm to survive, links to parent firm for learning and support purposes of “reimprinting” is pivotal (Ferriani, Garnsey, & Lorenzoni, 2012). As an illustration, Xerox Corporation arose by employing an effective business model to commercialize a technology rejected by other leading companies of the day. The successfully commercialized spin-off companies include 3Com, Adobe, and SyncOptics and they are proved to be representative cases of how organizational change should take change strategy well.

Therefore the purpose of this study is to investigate in integrative framework of organizational change into new market or industry, taking both micro and macro perspectives of organizational change into consideration. This study is based on the contextual factor of corporate entrepreneurial change setting, for example corporate spin-offs (Corley & Gioia, 2004), or intrapreneurship (Antoncic & Hisrich, 2001; Parker, 2011). Specifically, central attention is given to review previous studies and generate a framework on how organizational implement change strategy into new industry or market as a new organizational form and structure.

This paper is specifically aimed to examine the organizational change process in the following way. First, the

micro level review of literature in 'Entrepreneurs as change agents and their cognitive process' section is demonstrated. The part will embody how organizational change is initiated and supplemented by change agents. Then the organization wide change process after the capturing of change opportunity by individual agents will be illustrated by embracing macro level analyses of theories. Next, explication of how the two streamlines of literature can be aligned complementarily will be shown in integrative framework part. Lastly, the concluding remarks will follow.

### **CHANGE INITIATION: MICRO LEVEL PERSPECTIVE**

In the micro level literature, the tripartite approaches of cognitive, emotional, and intentional framework dominates explicating how individual can ignite and implement the organizational change process into the new market or industry (Piderit, 2000). In this paper, the main intention is to draw a comprehensively overarching perspective more focusing on the sequential and descriptive assessment of the theories, not limited to a single approach.

#### **Entrepreneurs or Top Management Team as Change Agents**

How does organizational change commences? Mainly the micro level studies that fall into investigating the related issues of how or who starts change generally assumes the organizational change is initiated by an individual or a small number of individuals within the organization, known as change agents and the influence of agents spreads out to the entire organization throughout the network (Battilana, Leca, & Boxenbaum, 2009). Here, change agents refer to those who are responsible for identifying the need for change, creating a vision and specifying a



desired outcome, and then making it happen (Kanter, Stein, & Jick, 2003). The term 'Change agents' is equivalent to what Kanter and her colleagues call "change strategists and implementers" in a sense that they bring change into the organization. Yet, their roles somewhat differ that change agents are more toward to the situations of corporate spin-off or change into new industry while change strategists and implementers generally work within the firm.

Roles of change agents include those engaged in the actual conduct of the change, as well as those who call for and sponsor it. Ever since Schumpeter emphasized the role of entrepreneur who finds entrepreneurial opportunities for changes, in has been a long tradition in economics that what the traits of those entrepreneurs or change agents have (Schumpeter, 1961). The initiators can originate both from high levels (Fleming, Mingo, & Chen, 2007) or even low levels (Burt, 2004) within the organization. Entrepreneurs themselves, board members or the top management team in the upper echelon can initiate the change process as high levels while low levels might include middle managers as well as bottom line employees. Examples of previous studies in terms of the individuals as change agents are previous scientists in the universities shifting toward entrepreneurs (Stuart & Ding, 2006). Here, it is well depicted how a university-employed life-scientists becomes entrepreneurs, divergent from conventional organization to a new biotechnology firm with a seemingly prospective entrepreneurial opportunity. Given this, the importance of the agents' or entrepreneurs' mindset, schema, or orientation toward change becomes more emphasized. Also such prior experience or backgrounds as the educational prestige or employment affiliation takes more account on explanation of change performances (Rider, 2012).

### **Cognitive Process of Change Agents**

If the individual initiators' are main drivers of organizational changes from internal firm to respond to external contexts, how likely the cognitive processes are to take place and spread to the network? Here schematic perspective on organizational change is adapted (Lau & Woodman, 1995). A schema is a cognitive structure that represents organized knowledge about a given concept or type of stimulus. A similarly defined concepts as schema are knowledge structures, core beliefs, cause maps (Walsh, 1995). A schema contains both attributes of the concepts and the relationship among the attributes. In a micro level cognitive approaches, the schemata enables agents to see possibilities of change within the organization and encourage others to adopt new practices (Van De Ven & Poole, 1995). It is known in the previous studies that the construct of schema consists of four individual difference dimensions as antecedents: locus of control, dogmatism, organizational commitment and general attitude toward change. Locus of control refers to change agent's beliefs concerning the source of control over events affecting them. Dogmatism defines the extent to which a change agent's belief system is open or closed which relates to receiving evaluating, and acting based on the belief. Next, organizational commitment is a set of attitudes toward an employing organization and lastly general attitude toward change is overall traits of agents with different strengths environment in the face of specific change issues or contexts involved. The four dimensions are traditionally accepted as it is plausibly applied in general organization context where event-based frames are identified. In other words, when changes in the organization have started, the individual differences stimulate his or her change schema, reacting to the changing organization. This means that although change schema is more likely to construe reality in temporal and passive change and not appropriate

organizational change toward entrepreneurial context when agents are to drive and initiate the change. Thus, we need additional constructs in micro level that are more suitable in the context of new organizational changes that seeks entrepreneurial opportunities.

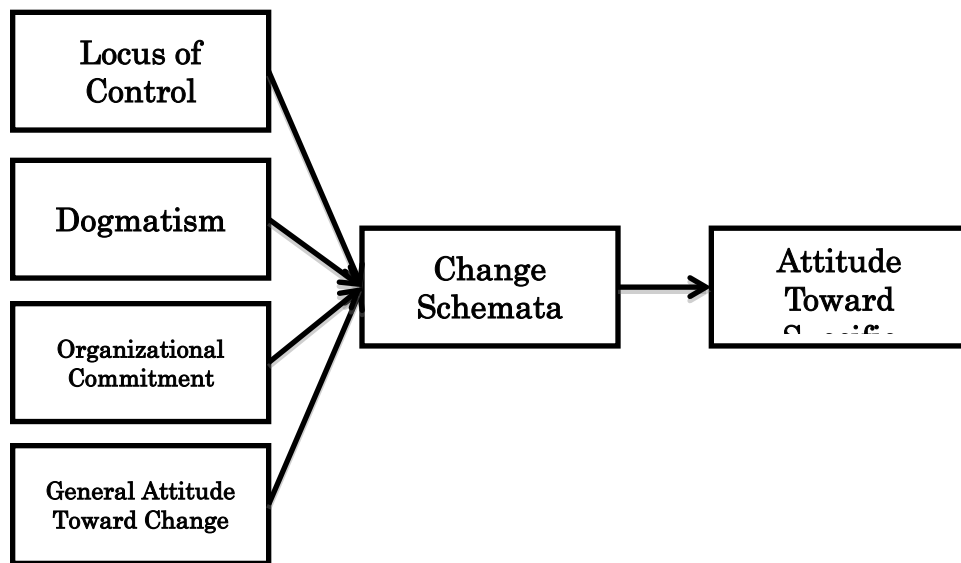


Figure 1. Effect of Individual Differences and General Attitude Toward Change

## **CHANGE DIFFUSION: MACRO LEVEL PERSPECTIVE**

### **What Affects Change Diffusion Throughout the Organization?**

Different theories are to be associated with different settings in macro level perspectives. Previously, each contextual factors are understood in diverse theoretical perspectives including institutionalism (Greenwood & Hinings, 1996; Kim et al., 2007), resource based-view (Alvarez, Sharon, Barney, 2002; Foss, Klein, Kor, & Mahoney, 2008), behavioral theory of the firm (Greve, 1999), or network perspectives (Seidel & Westphal, 2004). Whichever theory scholars may take into consideration, the goal of the scholars is to understand how contextual factors can account for the organizational change.

Had the change agents mentioned previously been ready for the change action, how would the detailed change process develop? Contextual situations are to be considered in this macro level analyses part. The change process to the end of the entire organization may come to reality depending on extremely diverse contextual situations such as (a) environmental, (b) change inertia or momentum (Beck, Bruderl, & Woywode, 2008; Kelly & Amburgey, 1991), (c) international and cultural atmosphere (Pettigrew et al., 2001), (d) resistance or receptivity to change (Oreg & Sverdlik, 2011), and (e) time, sequencing, rhythm or pace (Huy, 2001; Huy & Mintzberg, 2003). Here, each contextual factors in the macro level analyses are examined in detail and integrative framework considering the factors is demonstrated.

#### **(a) Environmental Factors**

The environmental context of organizational change is mostly in dichotomized contexts: Inner context and Outer context (Pettigrew et al., 2001). The two contexts promote and repress the change at

the same time, depending on the situation. The contexts, therefore, are likely to be moderator of change processes. On one hand, outer context embraces situations externally existing in the view of organization. To illustrate, economic, social, policy or regulation changes, or industrial changes in the environment are all examples of the outer context. Inner context, on the other hand, is entitled to feature of the structural, cultural and political environment within the firm that members of an organization believe is necessary for strategic change. Widely discussed organizational variables such as size or age are included in this context.

The reason the environmental influence is important is that organizational consequences and further research agenda are directly related to it. It is well surveyed that the environmental context is directly related to innovativeness or creativity of organization that are notable stepping stones for further theory development (Woodman, Sawyer, & Griffin, 1993). Also from the environmental factors, further questions linked to ambidexterity of firm can be followed because exploration is likely to have great influence on outer context while exploitation can have an effect on inner context (March, 1991).

#### (b) Change Inertia or Momentum

When organizations confront change reiteratively, it is likely that learning effect would take place. In the learning process of change, firms would generate propensity toward change. The repetitive inertia or momentum may influence the result of change. The contextual factors regarding inertia or momentum of change has mixed results.

Some proved that the momentum does exist in organizational change context. Kelly and Amburgey, in their seminal paper, examined how change influences organizational

survival. By taking a close look at a discontinuous, coarse-grained environmental change, the authors examined that the organizations that experienced changes were significantly more likely to iterate the similar type of organizational change again. As a result, it is suggested that the concept of momentum is complementary to inertia theory.

Others counter the argument and negate the effects of momentum of change. Beck and his colleagues attempted to understand this inertia effect of change in organizational setting. In their paper, on the contrary to generally accepted consensus that prior change increases the probability of further change, the authors found that change propensity decreases as changes accumulate. By arguing methodological issues neglected in the previous studies, researchers challenge self-enforcing change process of “repetitive momentum hypotheses”.

#### (c) International and Cultural Atmosphere

The clear sense making of differences in national and cultural atmosphere within the organization exists, yet, there has been lack of strong interests in the topic (Clark, 2002). There are many reasons behind this. First is lack of data. It is potentially impossible to gather qualified data from countries based on a single qualification. Second is empirical difficulty of analysis. Rigorous analyses should ensue for thorough understanding of differences among countries.

There are a few studies in this regard that delve into the relationship (Ardagna & Lusardi, 2008; Fairlie, Zissimopoulos, & Krashinsky, 2010). Here is one exemplary study by Klapper and his colleagues in terms of international differences in change and new firm formation. The study attempts to understand relationships between business creation by organizational change, investment climate, and economic development. Specifically, the

authors clarify how different levels of entrepreneurship in each country are affected by country-specific factors. Measuring level of entrepreneurship by total business density, entry density and entry rates, 101 countries in time period between 2000 and 2008 are analyzed. Result suggests that countries that facilitate entrepreneurship are more likely to increase overall economic growth as well as expansion of formal governmental sector. From this national differences are one of the important concept to consider when understanding organizational change in new economic activities (Klapper, Amit, & Guillén, 2010).

(d) Resistance or Receptivity to Change

Resistance to change is likely to appear due to change inertia. In traditional theories, resistance has largely intrigued scholars' interests, in particularly generally focusing on negative consequences of resistance to change. For example, from institutionalism perspective, resistance to change is inappropriate template of organizational quality to achieve acceptable level of legitimacy (DiMaggio & Powell, 1983). To gain legitimate organizational arrangements, organizations should stress stability in processes of mimetic, normative, and coercive institutional contexts (Tolbert & Zucker, 1983). In ecology literature, organizational change is regarded as of negative influence on firms' reproducibility and stability (Hannan & Freeman, 1977, 1984; Hannan, 2006). Organizations with less change and more inertia to constant reproduction are more likely to be selected and survive. Given the fact, lack of receptivity toward change is generally been dysfunctional obstacle for organizational change and entrepreneurship.

Recently, however, the literature has been focusing on resistance to change as a resources or assets of firms, more attention paid to positive consequences. The value of resistance

has on organizational outcome is now more than a contribution than necessary axis of evil. To illustrate, three different values of resistance are suggested to have a supportive effect (Ford, Ford, & D'Amelio, 2008). The three types of values - existence, engagement, and strengthening value- locate on the core of discussion with respect to resistance to organizational change. Existence value posits that resistance is functional because it keeps the topic of organizational change "in play" creating the environment of sense making and conversation. Engagement value reflects the thoughtful, considered, and informed choice of the organization about the change process generating long-term viability of change discussion (Duck, 2001). Lastly when organization is under the authentic conflict of change rather than contrived change with political issues, strengthening value is very effective. The conflict is one of the ways to help the organization inoculate and immunize the organization against subsequent change. Immunized organization becomes strengthened by the change experience, generating change-friendly contexts within the organization.

The mixed result of resistance/receptivity effect on organizational change is expected to have potential research agendas followed by gaps filled in the literature.

(e) Time, Sequence, Pace or Rhythm

When, in what order, or how often organizational change is likely to be developed and successfully implemented? The research related to the time, sequence, pace or rhythms of organizational change to new industry are to be notable building blocks to answer the question. Since there is an analytical interdependence of time, sequence, pace or rhythm and receptivity, the difficulty of understanding each context independently is a considerable issue. Some researchers pay attention largely on continuously time-



paced process as the focus of analysis (Brown & Eisenhardt, 1997) while others take fast pace organizational change decision is target of analysis (Eisenhardt, 1989). In relation to pace, two different types of change may occur; evolutionary and revolutionary change. When organizational change process toward new industry treats change as a ongoing, pacing and non-episodic, it is evolutionary change (Haveman, Habinek, & Goodman, 2012). Continuous change is cumulative of changes following the change sequence of freeze-rebalance-unfreeze cycle. This adaptive process of organizational change is “a new pattern of organizing in the absence of explicit a priori intentions” (Pettigrew et al., 2001) and generally takes long-term time. Revolutionary change, on the contrary, has a tendency to be infrequent, discontinuous, and intentionally planned. The process of change is generally transformational, episodic, and takes place throughout the short-term. Episodic change follows the sequence unfreeze-transition-refreeze and organizational situation move from one state to another by allowing interventions in the processes.

Here, definition, categorization and brief review of each related line of concepts are to provide helpful insight to future researches. First, according to Bluedorn and Denhardt (1988), quantitative time refers to time shown on clocks that is precisely measurable while qualitative time indicates subjective time of various interpretations. Each category of time has difference influence of change processes because quantitative time may endow socially resourceful commodity that can create monetary value to firms and also because qualitative time subjective and informal experiences of time may trigger psychological stress to change agents. Secondly, sequence refers to the order in which events are aligned. This is based on the conjecture that certain order should be prioritized when change considering change process. Next, pace is self-evident in definition and comparison

between evolutionary and revolutionary assessment of change is to shed light on the future interests on pacing. Lastly, rhythm is a pattern of variability in the intensity and frequency of organizational change (Huy, 2001; Huy & Mintzberg, 2003).

As possibly contingent and divergently situational changes are likely to occur from the categorization and definitions, it is important to understand how the organization perceives time, find optimal sequence, continuously manage appropriate pace and take advantage of rhythmic changes of contexts. This is because various combinations of time specific contingency conditions are to engender inconceivable number of possible situations and each possible cases of organizational change process may have differently unknown implications.

The five situational context factors are key issues that help researchers conduct further studies in terms of organizational change into the new market or industry. The coarse-grained assessment of five previously noted issues is expected to have important mediating and moderating effects on understanding organizational change.

## **INTEGRATIVE FRAMEWORK**

The integrative framework presented in Figure 2 links micro and macro perspective, abridges the gap between the two, and provides more comprehensive theoretical framework. Theoretical contribution of this framework is that it combines two different paths of studies into a single thorough compared to organizational operating process. Another contribution is that entrepreneurial process is considered. Organizational change into new industry as new organizational form or structure has been largely neglected in the literature. This paper is most likely to add more explanatory power to change and entrepreneurship literature as a result.

To link micro level to macro consequences, it is important to bring related descriptive phenomenon into generalizable concepts. In the previous section of this paper, the micro setting of organizational change and the role of change agent are emphasized. To apply the micro setting to entrepreneurial context, it is necessary to suggest more relevant concept in entrepreneurship studies. The schemata of change agent, the main explanatory construct, is to be understood in organizational change into new firm foundation setting. The equivalent concept in entrepreneurial setting is a construct known as 'entrepreneurial orientation' and it is primarily the driving force of the corporate entrepreneurship (Memili, Lumpkin, and Dess, 2010). The change agent of strong schema is likely to have competitive advantages by involving processes, practices and decision-making styles that affiliate organization to identify and capture entrepreneurial change opportunities (Kuratko, 2005; Lumpkin & Dess, 1996). As antecedents of schemata includes locus of control, dogmatism, organizational commitment and general attitude toward change in a conventional organizational context, they can be correspondingly associated with that of entrepreneurial orientation in an organizational change context. The entrepreneurial orientation consists of autonomy, risk taking, proactiveness, competitive aggressiveness, and innovativeness. The change driven schemata is significantly related to attitude toward specific change and this result indicates that individual attitudes and personal aspects cognitively covaries. To create each link between change schemata and entrepreneurial orientation, each variable are coupled to proper individual traits (Table 1).

Table 1. Comparison Table of Change Schemata and Entrepreneurial Orientation

	Autonomy	Innovativeness	Risk Taking	Proactiveness	Competitiveness Aggressiveness
Locus of Control	X				
Dogmatism			X		X
Organizational Commitment				X	
General Attitude Toward Change		X	X		

‘Locus of control’ and ‘autonomy’ have common grounds because both focus on one’s self-determinedness, pioneer spirit toward the situation. Independent trait represents the important impetus of necessary for new ventures and the autonomy is one of the traits. ‘Innovativeness’ refers to organizational tendency to engage in new ideas, novelty, and creative process that lead to possible new products or services. Self evidently this closely relates to attitude toward change. Next, ‘Risk taking’ reflects three aspects in financial terms: (a) "venturing into the unknown," (b) "committing a relatively large portion of assets," and (c) "borrowing heavily" (Lumpkin & Dess, 1996). The preference toward risk, thus, is willingness to take large and risky resource commitment and this involves how much one is swilling to sustain one’s belief. Therefore, the risk taking similarly represent entrepreneurial aspect of change agent with appropriate level of dogmatism and general attitude toward change. Proactiveness, moreover, is how much forward-looking aspect one has upon new

venturing activity. It is defined in a Webster dictionary as 'Acting in anticipation of future problems, needs, or changes' and it is how much one is willing to be involved in the process. In schemata perspective, it similarly assesses one's organizational commitment. At last, competitiveness aggressiveness refers to organizational tendency to directly and intensely challenge its competitors to achieve entry or improve position. In other words, it is degree of responsiveness under the goal of outperforming rivals in the industry. It is related to openness to one's belief that is relevant to dimension that evaluates the level of dogmatism.

After the change agent has implemented the action from one individual level, the organizational change process is to be diffused to the entire organization. In the change diffusion to the new entrepreneurial process, some of the contextual factors that need to be considered are reviewed from the previous studies. Some are neglected in the previous literature whereas others are shown with mixed signals and results. It is of great importance that in the future studies that these contexts can be in action at the same time. Recently, organizational changes are typically explicated when organization undergoes a change in a single context whereas others attempt to include multiple contextual factors into consideration of analysis. This indicates that business researchers should consider the multi-context in multi-time period (Pettigrew et al., 2001). The interconnectedness of contexts over time that is embedded in a setting for analyzing organizational entrepreneurial change will most likely help understanding organizational change.

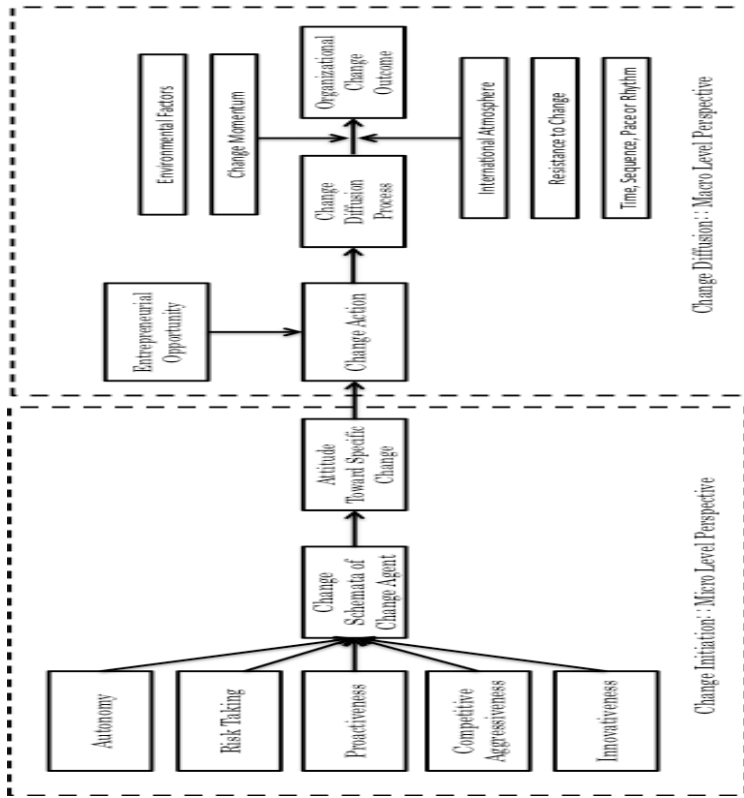


Figure 2. Integrative Framework of Organizational Change into New Industry

## CONCLUDING REMARKS

In this paper, the micro and macro level theories of organizational change into entrepreneurial activity is examined. By dividing the perspectives into change initiation and change diffusion processes, the combination and alignment of micro and macro level perspectives are analyzed. The study is based on the assumption that organizational change is ignited by an individual agent or small group of change agents and diffused throughout the

whole organization as the agents and the system within the organization help agents to diffuse the change sentiment and sense making. In diffusion process, the pluralism perspective, taking pertinent contextual factors to account for the organizational change phenomena, is taken and it is likely that the perspective greatly helps in understanding how exploration of multiple contexts actually acts and reacts with organizations.

The paper has some contributions in the literature that should be noted. The assessment of micro and macro change literature is expected to contribute to emerging entrepreneurship studies as well as organizational change and development-related literature. As it is indicated throughout the article, there also is a need to resolve and dichotomized literature of theories and practices. In particular, detailed and diversified contextual factors are to be helpful for future studies as well as future interdisciplinary topics from different intellectual traditions. The linkage, furthermore, between traditional organizational change literature and new organizational forms or structure as in entrepreneurial setting is worth commenting.

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## **The Effect of the Servicecape on Service trust, Customer Satisfaction, and Customer Loyalty in Indian Family Restaurant**

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### **ABSTRACT**

*This research work aims at exploring factors like servicecape, trust and customers' preference and the relationship with customer satisfaction and loyalty relationship with customer satisfaction and loyalty in the restaurant industry. The Indian restaurants are employed as target samples due to easy*

*access in collecting the data and also due to the fact that these restaurants are a single function activity unlike bit hotels and shopping malls. The servicecape and trust has a position influence on the outcome variable, customers' preference of restaurants which relies on customers' own knowledge (CPRRK), as is evident from the fact that majority of customers select restaurants on the basis of their past experience. The questionnaire for the research survey was divided into two parts: a. questions relating to servicecape were designed on the basis of Bitner's, model and b.for question relating to trust, seven aspects designed by Hess were used. Customers were asked to answer, questions regarding restaurant's reputation or image caused by the servicecape issues and other aspects relating to trust.*

**Keywords:** Servicecape, trust, customer satisfaction, customer loyalty, Indian restaurants

## INTRODUCTION

In many Asian countries one of the major contributors for the service sector is the restaurant industry. The increase, in the number of new entrants offering a variety of food products and services of a different kind has resulted in intense competition within the industry. However, it is very challenging to achieve superior service for the different types of customers due to the very nature of restaurant industry which is characterized by high contact and people-processing services.

The success of restaurants depends on how they achieve high level of customer satisfaction ultimately resulting in customer loyalty .From this perspective it is significant to understand the relative importance of a number of key factors which influence both customer satisfaction and loyalty. The

researcher in this paper tries to investigate several factors such as servicescape, trust customers' preference of restaurant and loyalty in fast food, food court restaurants and fine dining in India. The restaurants are selected on the basis of large number of customers. Emphasis is laid on the role of service environment, as the importance of dining environment/atmosphere is gaining the attention of service researchers in hospitality industry.

The marketers and practitioners have to go a long way to attract and retain customers because of the intense competition within the industry. It is here, the experiential marketing plays a vital role, experiential consumption is a view that focuses on the "symbolic, hedonic and aesthetic nature consumption in the pursuit of fantasies, feelings and fun". From this point of view, in order to survive, the marketers and practitioners have left no stone unturned to motivate the multi-sensory systems of the pleasure seeking contemporary consumers. The servicescapes have been acknowledged by the academic theorists as well as the entity practitioners for the simple reason that they are all about the stimuli of physical environment of service encounters in a way that attracts customers' eyeballs in the first place prior to the real buying (Bitner, 1992).

The significance or importance of servicescapes can be traced back to the early 1970s when Kotler (1973) used the 'atmospherics' to express the "quality of the surrounding place" measured through the stimulation of customers' sensory systems in terms of "visual(color, brightness, size and shapes), aural(volume and pitch), olfactory(scent; freshness) and tactile(softness, smoothness and temperature)".

It is rightly said –first impression is the but impression! The servicescape is the outward appearance of an organization and plays a vital role in building the initial impression or setting up the customer expectations. In achieving customer expectations, it



is clear that the servicescape plays a number of roles, often simultaneously (Zeithaml and Bitner, 1996). The present research focuses on the impact of servicescape on customers seeking quality perceptions. The researcher tries to analyze the gaps between management's perceptions of customers' expectations and the customers' expectations. Booms and Bitner developed the concept of servicescape to emphasize the impact of physical environment in which a service process takes place.

Since, Kotler (1973) indicated that "atmospheres may become the chief form of competition", the dimension of the servicescape and the interactions between the employees and the customers are likely to influence the service employees. The servicescape of a restaurant or any other place can be improved or modified by moving or removing things or adding to the environment or physical surroundings.

The physical environment will influence customers' purchasing behavior and create an image particularly apparent for service industry (Bitner, 1990; Zeithaml et al., 1985; Booms and Bitner, 1982; Kotler, 1973). Bitner (1992) observed that the term servicescape has three dimensions, namely ambience; special layout; and signs, symbols and artifacts.

In fact, several studies have examined the effects of general servicescape factors within the service environment. For example, Turley and Milliman (2000) indicate that the music played in shops is the most extensively studied element, and that the background music in a retail store has a significant impact on a variety of consumer behaviors; such as consumptions and time spent in the shops and so forth. Baker et al. (1994) examined the relationships between store environment and store image. According to his study the ambiance has a greater influence on store image than the design factors. Likewise, a study of restaurant customers conducted by Ward et al. (1992) indicates

that “customers’ inferences about the prototypicality of restaurants were strongly influenced by environment cues.” It was expressed by Hirsch (1995) that even the aroma in a casino may enhance the gambling mood of casino patrons.

In addition, in the areas of management and marketing, trust has been suggested as an important element in the business environment (Harris and Goode, 2004; Delgado-Ballester et al., 2003; Hess, 1995; Morgan and Hunt, 1994). Trust is based on the belief that some behaviors will take place as expected (Knoll and Jarvenpaa, 1998). Morgan and Hunt (1994, p.23) define trust as “confidence in an exchange partner’s reliability and integrity.” There are further descriptions of trust; for example trust leads to higher customer loyalty (Agustin and Singh, 2005); trust urges lower opportunism (Rindfleisch and Moorman, 2003); trust creates more service usage (Maltz and Kohli, 1996); trust is a potentially important factor that influences consumer behavior (Bredahl, 2001); and trust provides greater commitment (Jap and Ganesan, 2000).

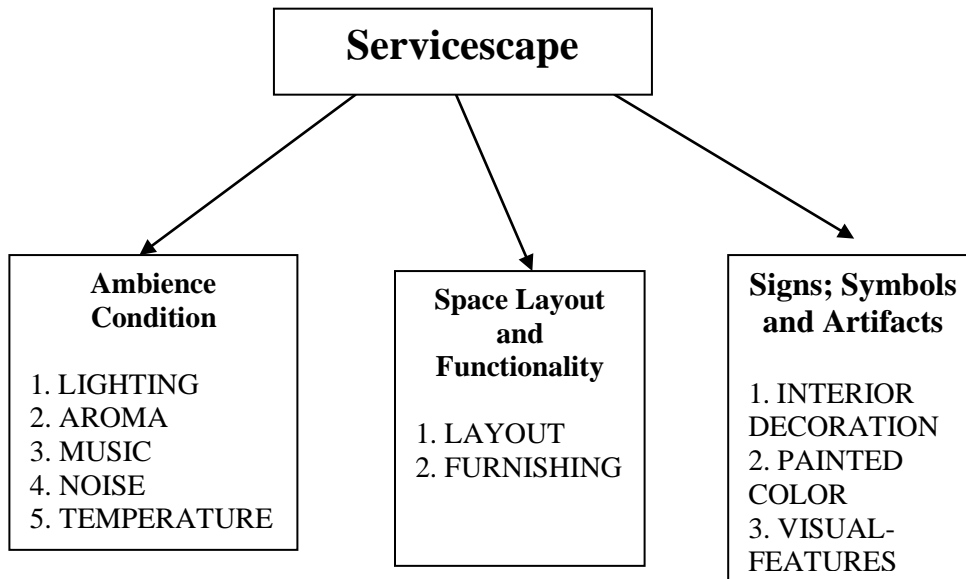


Figure 1: The Conceptual Model of Servicescape

From the above studies regarding servicescapes or environmental factors, it can be well established that they are relatively common in the western countries. However, the empirical studies which focus on Indian societies are rather more limited (e.g. Liu and Jang, 2009; Venkatraman and Nelson, 2008; Hwang, 2007), or focus on a retailing environment within a traditional Western shop (Venkatraman and Nelson, 2008). They may ignore the factors of cultural and organisational diversities. Ezeh and Harris (2007) strongly contend that the research on servicescape should consider the concept of cultural diversity and the need for this has to be expanded. In addition, trust plays a vital role and has been studied to a great extent in the Indian society. The previous literature on trust in Indian society is largely limited to trust and business behavior (Lui, 1998); or trust

in family matters or personal relationships (Ip, 2008; Kopnina, 2005).

The present research has stressed on the significance of servicescape and trust on customers' preference of small Indian restaurants which depend on customers' own experience within the society. The basic reasons for the selection of small Indian restaurants are – Firstly, several small restaurants are found in almost every street in India, thus making it very easy for the customers to find different restaurants in a very short span of time. Different restaurants provide different types of servicescapes, services and may have different trust levels depending upon the customers' views. Secondly, in the recent past, the restaurant industry in India has experienced intense competition and greater levels of expectations from the customers Hing (1995). Kotler (1973) also said “restaurants provide a physical product, foods, and the culinary services of cooking, serving, and cleaning up”. They may therefore have many potential benefits that could emerge from conducting customer-based evaluations of trust and servicescape. The small Indian restaurants are therefore employed as target sample due to easy access in collecting the data and also due to the fact that these restaurants are a single function activity, unlike big hotels and shopping malls.

Thus, the outcome variable, customers' preference of restaurants which relies on customers' own knowledge (CPRRK), represents the extent to which factors arise from servicescape and trust scales, as the majority of customers select restaurants on the basis of their past experience.

For restaurant customers, a significant relationship was found from customers' perceived experience to re-consumption in the restaurants (Clark and Wood, 1999). More specifically, customers' perceived experience can connect to customers'

satisfaction or dissatisfaction (Walsh et al., 2009; Anderson and Mittal, 2000). At the same time, customer satisfaction has a positive relationship with customer loyalty (Walsh et al., 2009; Lee et al., 2005). Therefore, the outcome variable (CPRRK) infers that customers' satisfaction or loyalty depends on independent variables. Thus, in order to collect data regarding customers' preference a question was designed "my choice of restaurant depends upon my own experience", from 1 strongly disagree to 5 strongly agree.

## THEORETICAL BACKGROUND AND HYPOTHESIS

Based on the review of pertinent literature as noted above, a conceptual framework was established (as shown in Figure 2) on the outcome variable, Customer' Preference of Restaurant which Relies on customer' own Knowledge (CPRRK).

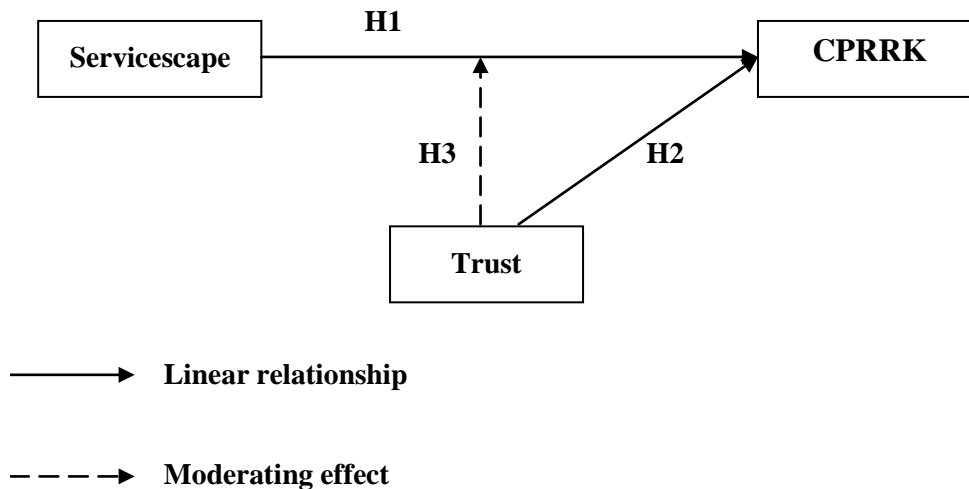


Figure 2: A Framework of Servicescape, Trust and CPRRK

It is a commonly accepted fact that servicescape has a great influence on customers' emotional responses in a wide range of contexts. Indeed, servicescape leads customers to either choose to continue with their particular service provider, or to discontinue patronage (Harris and Ezech, 2008; Cockrill et al., 2008; Hoffman and Turley, 2002; Wakefield and Blodgett, 1996). As mentioned earlier the present research study which focuses on servicescape is largely from western countries, while empirical study which focuses on Indian societies is rather limited. Besides, Cronin (2003) states that "very little effort has been devoted to a critical examination of the service environment's impact in the explanation of consumers' purchase decisions". In addition, most of the studies that concentrate on the influences of servicescape elements on customers have tended to focus on a single servicescape element (Ezch and Harris, 2007), such as music (e.g. Hui et al., 1997; Areni and Kim, 1993; Yalch and Spangenberg, 1990; Milliman, 1986, 1982), aroma (e.g. Hirsch, 1995; Spangenberg et al., 1996), and light (e.g. Areni and Kim 1994). Only a few research studies deal with more than one servicescape elements (e.g. Harris and Ezch, 2008; Chebat et al., 1993; Wakefield and Blodgett, 1996). Ezch and Harris (2007) also suggest that one of the main impediments of servicescapes research is that it fails to cover cultural differences. Thus it can be hypothesised that:

**H1: Servicescape has a positive influence on CPRRK.**

Trust is undoubtedly a determining factor that has an impact on consumer behavior. The significance of trust is apparent in a number of studies (Delgado-Ballester et al., 2003; Rindfleisch and Moorman, 2003; Hess, 1995; Morgan and Hunt, 1994) which directly connect trust with customers' attitudes

(Grayson et al., 2008; Agustin and Singh, 2005; Bredahl, 2001; Jap and Ganesan, 2000). The importance of trust within the Indian society is quite evident, as mentioned earlier, the previous studies of trust were mainly confined to trust in family matters or personal relationships or to the relationship between trust and business behavior. Moreover, Walsh and Beatty (2007) also observed that the existing studies emphasise more on the industrial customer or multiple stakeholder groups Walsh et al. (2006), and mostly ignored the end user. So far as the food industry is concerned, trust is inherently an important factor which has an enormous impact on consumer behavior (Frewer and Salter, 2003; Bredahl, 2001).

## **H2: Trust has a positive influence on CPRRK.**

Furthermore, we also included trust as a moderating variable (M.V). Although linear relationships (correlation and linear regression) may provide useful information in exploring potential associations between independent variable (I.V) and dependent variable (D.V), “what if an independent-dependent variable relationship is affected by another independent variable?” (Hair et. al., 2010). In statistics, moderation occurs when the relationship between an independent variable and a dependent variable is reliant on a third variable. The third variable is referred to as the moderator variable or simply the moderator (Cohen et al., 2003). Thus, a moderator (moderating variable) could have an effect on the relationship between I.V and D.V; and an interaction emerges from the relationship between the variables, otherwise known as the moderation effect (Preacher et al., 2006; Irwin and McClelland, 2001). This is also known as “an interaction effect and is similar to the interaction term found in analysis of variance and multivariate analysis of variance” (Hair

et al., 2010, p.180). Moderated multiple regression (MMR) is a frequently used technique for detecting complex and non-linear relationships (Homburg and Giering, 2001; Aguinis, 1995; Cohen and Cohen, 1983). Moreover, due to the nature of MMR, “it employs what are known as moderator or interaction effects within the regression model that allows for the slope of one or more of the independent variables to vary across values of the moderator variable” (Goode and Harris, 2007). Therefore, MMR allows greater flexibility while designing and testing a wide range of relationship between I.Vs and D.Vs through moderators. Aguinis (1995) established that most of the earlier research adopted moderators and came to a conclusion that moderating effects play a vital role in theories of management, social and behavioral sciences. For marketing research, MMR is a widely accepted technique (Homburg and Giering, 2001) due to MMR allowing a moderating effect to occur between I.V and D.V. Irwin and McClelland (2001) even indicate that “moderated relationships are central to marketing”.

It may be observed from figure2, trust has been defined as moderating in the present study to test whether it influences the relationship between servicescape and CPRRK. The study provides two basic aspects to explain the reasons as to why trust has been adopted as a moderator-

1. Trust is an inherent factor that originates from the customers themselves. For example, “the variable most universally accepted as a basis of any human interaction or exchange is trust” (Gundlach and Murphy, 1993). Trust though hypothetical, can be experienced by every customer.
2. Trust boosts higher customer loyalty (Agustin and Singh, 2005; Doney and Cannon, 1997) and is impliedly an important aspect that influences consumer behavior (Bredahl, 2001). Accordingly, trust has a vital effect on



customers' intentions (Goode and Harris, 2007; Harris and Goode, 2004; Jones et al., 2000).

Thus, this research study used trust as a moderating variable to probe whether it affects the relationships between independent variables and CPRRK. Therefore, it can be hypothesised that:

### **H3: Trust balances the rapport between servicescape and CPRRK. Questionnaire Design**

This section has been divided into two portions- (i) questions relating to servicescape (Bitner, 1992) and (ii) questions relating to trust (Hess, 1995).

#### **SERVICESCAPE**

In this study, for the questionnaire design, Bitner's (1992) model has been used. Bitner's model "gave us the first clear view of the servicescape as a whole, and the components of the servicescape" (Cockrill et al., 2008). In a number of recent studies also this model has been used (Harris and Ezech, 2008; Cockrill et al., 2008; Reimer, 2005). The questions for the servicescape were framed on the basis of retrospective experience sampling, (i.e.) customers' were asked to answer questions regarding restaurants' reputation or image earned by the servicescape issues. A part of the questionnaire consisted of a set of close-ended questions. The ambience was measured using a five-item scale developed from the studies of Wakefield and Baker (1998), Wakefield and Baker (1996), Harris and Ezech (2008). The questions on the layout have also been adopted from previous studies; such as those by Wakefield and Baker (1998) and Wakefield and Baker (1996). All components used a Likert-type five-point response scale. This ranged from strongly disagree (1) to strongly agree (5).

## **Trust**

Hess (1995) designed seven aspects relating to trust and the same have been used in the questionnaire for this research survey. The Hess measure was at first established to ascertain customers' trust in car sales. Harris and Good (2004) analyzed the availed trust measure and observed that the Hess measure is most pertinent to the customers' emotions due to the measure being accurately perceptual in nature and the scale being designed to correctly measure the customers' trust. Therefore, the Hess measure can be summed as the most desired method in trusting the trust of the customers' towards the service industry. Hence, for the present study, this measure may be the most appropriate to adopt as customers can comfortably understand the 'Trust Scale'.

Some of the original aspects of servicescape adopted by Wakefield and Baker (1998 and 1996); Harris and Ezeh (2008) and some aspects of trust applied by Hess (1995) have been left out and replaced by other aspects. In spite of the fact that several research has were done in the field of servicescape and trust, still in order to measure these concepts in the context of a restaurant, there was a strong necessity for scale development and adaptation. However, several aspects used in this survey were identified, with the exception of a change of industry.

## **FINDINGS AND DISCUSSION**

The data was collected in New Delhi. Overall, 221 questionnaires were eventually included for data analysis; 140 of the respondents were male (63.35%) and 81 (36.65%) were female. Next, the Principal Component Analysis (PCA) with Direct Oblimin Rotation was undertaken. Only the factor loadings above

0.5 were displayed, making the output easier to interpret (Hair et al., 2010).

Table 1. Principal Component Analysis (PCA) Of Servicescape

Factor Analysis		
	Pattern	Coefficients
	Component1	Component2
Items		
Ambience A		0.661
Ambience B		
Ambience C		0.529
Ambience D		0.776
Ambience E		0.642
Layout A	0.663	
Layout B	0.690	
Layout C	0.898	
Layout D	0.752	
Layout E		
Eigenvalues	3.671	1.563
% of Variance	40.321	13.654
Cumulative %	54.367	
KMO	0.791	
Bartlett's Test of		
Sphericity	0.00	

\*Suppress absolute values less than 0.5

\*\*PCA with Direct Oblimin Rotation

\*\*\*Two components were extracted

According to Table 1, for the servicescape scale, there were two components with eigenvalues over 1, 3.67 and 1.56, explaining 40.32% and 13.65% of the variance respectively. The

PCA output of the servicescape factors gave a very clear result. Each of the variables loaded strongly in the expected components, and each component was represented by a number of strongly loaded variables. For further analysis therefore, two new variables were obtained; Layout scale (LS) and Ambience scale (AS). Furthermore, for 'trust' there was only one eigenvalue that exceeded 1, in turn explaining 93.55% of the variance. Both of the two results of the PCA above, the KMO and Bartlett's Test of Sphericity were passed (Pallant, 2007). Hence, the factors were accepted.

Table 2. Reliability Test Results

Variables	Items	Cronbach's $\alpha$	
Ambience scale	5	0.67	0.79 (Total 10 items/ before PCA)
Layout scale	5	0.66	
Trust	7	0.88	

Furthermore, as shown on Table 2, the values of Cronbach's  $\alpha$  were higher than 0.7 (Nunnally, 1978), or higher than 0.60 (Peterson, 1994). In general, the values of Cronbach's  $\alpha$  in the Table 2 are higher than the generally agreed value 0.79 (Hair et al., 2010; Pallant, 2007; Nunnally, 1978). Although one value of alpha is lower than 0.70 in the subgroup for layout scale, the value is 0.66 and adopted by Horng and Chen (1998), and Nunnally (1967), this can be considered acceptable.

The convergent validity and discriminate validity tests were also undertaken. The convergent validity was tested by the correlations between latent variables given by the PCA and each of the related items (Hair et al., 2010). The values of correlations were high and in the expected direction, suggesting an acceptable level of convergent validity. Table 3 shows the correlations

between latent variables obtained from PCA and each related item. The values in the table are high and in the expected direction, suggesting an acceptable level of convergent validity.

Table 3. Summary of Convergent Validity

Latent variables	Items	Item-total correlation
LS	5	(1)0.69 (2)0.77 (3)0.89 (4)0.69
AS	5	(1)0.70 (2)0.81 (3)0.89 (4) 0.89
Trust	7	(1)0.91 (2)0.92 (3)0.92 (4)0.91 (5)0.93 (6)0.94 (7)0.94

Table 4. Correlation Between Constructs and Summary of AVE

	LS	AS	Trust
LS	<b>0.59</b>		
AS	0.44**/0.23	<b>0.58</b>	
Trust	0.12/0.03	0.12/0.02	1

The level of discriminate validity of the servicescape was gauged via the adoption of the test suggested by Ryu et al. (2008); and Fornell and Larcker (1981). Ryu et al. (2008) indicate that discriminate validity exists because the within-construct item correlations are generally higher than the between-construct item correlations. The correlation coefficients presented in Tables 4 and 5 suggest that discriminate validity exists because the within-construct item correlations (see Table 4) are generally higher than the between-construct item correlations (see Table 5). Specifically, “correlation patterns within- constructs differ from the correlation patterns among- constructs, suggesting the

measures have acceptable level of discriminate validity” (Ryu et al., 2008).

Average Variance Extracted (AVE), another alternative factor-based method for assessing discriminate validity was proposed by Fornell and Larcker (1981). “The AVE (the average variance extracted shared between a construct and its measures) measure should be greater than the variance shared between the construct and other construct in the model, for example, the squared correlation between two constructs” (Hulland, 1999). As can be seen from Table 4, the AVEs, as marked in bold, were higher than the squared inter-construct correlations. For example, 0.20, the squared inter-construct correlation between LS and AS. In addition, Hair et al. (2010) also suggested that “an AVE of 0.5 or higher is a good rule of thumb suggesting adequate convergence”. The values of AVE are larger than 0.5 and therefore discriminate validity is established. Consequently, it was concluded that the servicescape scale used in the study is acceptable in terms of reliability and validity.

### **Hypothesis Testing**

After having established reliability and validity of the constructs used in this research, the next stage is to undertake formal testing of hypotheses of this study. The results of the correlation analysis conducted to determine the magnitude and direction of the associations between the independent variables and the dependent variables are depicted in Table 5. As presented, the relationships between the servicescape (LS and AS) and the dependent variable were investigated using a Pearson correlation coefficient. Although they have positive relationships, the correlations were very low in value and thus are not shown as being statistically significant factors. On the other hand, there

was a very strong and positive correlation between trust and CPRRK,  $r = 0.889$ ,  $n = 221$ ,  $p < 0.001$ .

Table 5: Correlation Matrix

	CPRRK	LS	AS	Trust
CPRRK	1			
LS	0.063	1		
AS	0.13	0.49	1	
Trust	.889**	.16	.13	1

\*\* $P < 0.01$  level (2-tailed)

Table 6 shows a significant overall model between the independent variables and CPRRK where  $F(5, 221) = 201.31$ ,  $p < 0.001$ ,  $R^2 = 0.89$ ,  $B = 2.868$  and  $t$ -statistic = 43.34. Assumptions of multiple regressions of multicollinearity, linearity, and heteroscedasticity were passed. Only the variable of Trust was presented as being significant in this model, the same as the correlation model. Accordingly, hypotheses 1 and 3 were rejected, while hypothesis 2 was accepted. The important result that emerged from this study is similar to that found in previous research conducted by Frewer and Salter (2003), and Bredahl (2001); trust is potentially an important factor that influences consumer behaviour. In this study, trust has a strong and positive relationship with customers' choice of restaurant which relies on customers' own experience. An inference can be drawn that trust may contribute to customer satisfaction (Walsh et al., 2009; Anderson and Mittal, 2000), and then further affect customers' loyalty (Walsh et al., 2009; Lee et al., 2005). On the other hand, the results of servicescape (LS and AS) show that servicescape factors are not statistically significant elements in the models. This finding is very unusual compared with much of the

American and British literature. It may be because this study focuses on ‘small’ Indian restaurants or on the different eating cultures between that of Indian society and Western countries, with the most relevant literatures coming from Western cultures. The importance of servicescape is very dependent on culture and may be applicable only in Western high-income economies. This study therefore provides few potential reasons as to why servicescape is not an important factor for an Indian restaurant in New Delhi or Greater Indian society.

Table 6. Summary of MMR for CPRRK

Variables		B	t-statistics
Constant		2.98	
Direct linkages			
Hypothesis 1:	Layout scale (LS)	-0.27	-1.99
	Ambience layout (AS)	0.89	1.23
Hypothesis 2:	Trust	2.01	32.56**
Moderated linkages			
Hypothesis 3:	LS x Trust	0.21	-1.43
	AS x Trust	0.11	1.43
Diagnostic statistics			
R <sup>2</sup> = 0.83			
Multicollinearity	Passed (checked via Tolerance and VIF)		



Linearity	Passed		
Heteroscedasticity	Passed		

\*\*\*Statistical significance at the 0.001 level;

Multicollinearity  Passed (checked via Tolerance and VIF)

Singularity  Passed

Normality  Passed

Outliers: checked by Residuals  Passed

checked by Mahal. Distance  Passed (over critical value)

Cook's Distance  Passed (less than 1)

### **Further group activity**

A description from Chow et al. (2007) that “in hospitality services, socially oriented activities and exchanges often provide the primary impetus for visiting one hospitality establishment over another, and this is particularly true of the restaurant industry in the Indian context”. Indian people engage in most consumption activities, such as having a meal with family, friends, and colleagues in ‘front stage’ or public Becker et al., (1999) also conclude that. Another research study conducted in Hong Kong by Kivela (1997) indicated that the role or importance of ambience in restaurants changed with different restaurant styles. For example, in Hong Kong only those from engineering/technical groups or business-occasion respondents selected ambience as being an important factor for restaurant selection. On the other hand, when dining out with family or for convenience, ambience and comfort level in the restaurants were not seen as determinant factors in their choice of restaurant. In the ethnic Indian or New Delhi eating culture, people like to go to a restaurant with people they know, and to sit at a round table conversing and eating together. Thus, the built environment or the ‘atmospherics’ of the restaurant may not be an important point for the attention of customers when choosing a restaurant.

### **Similarity and functional design**

Most small Indian restaurants in New Delhi are similar. The internal decoration is designed for function, not for comfort. For example, Indian restaurants in New Delhi mostly provide rounded tables and stools. This type of furniture makes it easier for customers to converse with each other, as well as to eat and drink. The furniture is also easy to clean and long-lasting.

### **Cost consideration**

In providing a favorable and interesting servicescape within a restaurant, the owner-manager of the restaurant requires the expenditure of time and effort. Accordingly, the price of meals will increase and customers will have to pay more for food. However, as discussed above, the eating culture in New Delhi constitutes the enjoyment of customers in a cordial atmosphere with family or friends rather than the 'atmospherics' of a restaurant. In other eating cultures, for example the French culture or some luxury market customers, they would be longing for comfort in a restaurant or the ambience or atmosphere of the restaurant may be the key factor for them when choosing a restaurant.

### **Culture concern**

Watson (1997) describes the influences that American fast-food restaurant chain McDonald's has had on local markets in Southeast-Asia. For example, in New Delhi French fries (chips) have become the snack food for young people. Interestingly, Indian customers may prefer to stay longer in restaurants such as McDonald's or KFC than they would do in a traditional Indian restaurant on the weekend or during holidays, because they enjoy the cheerful atmosphere and air conditioning that is provided in the summer. Another piece of research conducted by Venkatraman and Nelson (2008) indicates the existence of a 'New

Indian consumer'. These are consumers that have recently received a degree from a prestigious Indian university. They tend to appreciate the built environment or servicescape of the Starbucks chain in India. There are four reasons that Starbucks have captured these 'New Indian consumers' (Venkatraman and Nelson, 2008), two of these relate to servicescape which are as follows:

(1) Starbucks as 'Home': the furniture provided inside allows customers to feel comfortable, free, to relax and be at peace, in contrast to the noise and crowds on the outside.

(2) Starbucks as a 'Constellation' of personal space: inside Starbucks they feel they have a 'personal world' and a 'personal space', and they can have conversation with friends. In addition, they can do homework, read books, conduct business, surf the internet with their own laptop; etc. These 'New Indian consumers' are captured deeply by this 'private world' and 'world brand'.

Thus, eventually it may be concluded that when Indian or New Delhi consumers want to enjoy a restaurant with good servicescape, they may look for restaurants from different cultures.

## CONCLUSIONS AND IMPLICATIONS

Although previous studies suggested that servicescape or atmospherics is an important factor and has a positive relationship with customers' behavior in the various service environments (e.g. Harris and Ezch, 2008; Turley and Milliman, 2000; Hirsch, 1995; Areni and Kim, 1994; Baker et al., 1994; Bitner, 1990; Zeithaml et al., 1985; Booms and Bitner, 1982; Kolter, 1973), this study concludes that servicescape is not a critical factor in customers' choice of restaurant in New Delhi. This result reflects on Ezch and Harris (2007), that servicescape

research cannot neglect the aspect of cultural diversity. This study also provides some potential reasons as to why servicescape is not an important factor when customers are selecting a restaurant in New Delhi.

It should be noted that this study was limited to Indian restaurants in New Delhi. There have been only a few pieces of academic research emphasising the areas of servicescape and trust conducted in New Delhi. We could not find many related subjects from New Delhi for reference. Further, research should be conducted on the role played by, or the importance of, the factors of servicescape and trust in different service sectors within Indian society; such as shopping malls, hotels and other leisure industries in which customers may have to consider the servicescape when making their choice. Moreover, it is suggested that female customers' purchasing behaviors are easily influenced by the people that they know (Slama and Tashchian, 1985). This indicates when female customers are selecting a restaurant; they may be affected eventually by recommendations from people they know. Also, men and women may have different expectations of servicescape in a service environment (Hwang, 2007). Hwang (2007) also suggests that the male-oriented service products need to meet females' expectations. Therefore, for further servicescape research, the researcher has not only to consider the regional differences but also the gender of the customers.

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## The Risk Level of Viet Nam Tourism Industry Under Financial Leverage During and After The Global Crisis 2009-2011

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### ABSTRACT

*This paper evaluates the impacts of external financing on market risk for the listed firms in the Viet nam tourism industry, esp. during and after the financial crisis 2007-2009. First of all, by using quantitative and analytical methods to estimate asset and equity beta of total 10 listed companies in Viet Nam tourism industry with a proper traditional model, we found out that the beta values, in general, for many institutions are acceptable. Second, under 3 different scenarios of changing leverage (in 2011 financial reports, 30% up and 20% down), we recognized that the risk level, measured by equity and asset beta mean, decreases when leverage increases to 30% and decreases much more if leverage decreases down to 20%. Third, by changing leverage in 3 scenarios, we recognized the dispersion of risk level, measured by equity beta var of 0,767, increases if the leverage increases to 30% whereas decreases to 0,038 if leverage decreases to 20%. But the dispersion measured by asste beta var decreases to 0,473 (leverage up 30%), showing leverage efficiency. Finally, this paper*

*provides some outcomes that could provide companies and government more evidence in establishing their policies in governance.*

**Keywords:** Equity Beta, Financial Structure, Financial Crisis, Risk, External Financing, Tourism Industry

## INTRODUCTION

Financial leverage has certain effects on the risk level of listed companies on stock exchange. Flifel (2012) stated today, the assumption of efficient capital markets is very controversial, especially in these times of crisis, and is challenged by research showing that the pricing was distorted by detection of long memory. Gabrijelcic et al (2013) find a significant negative effect of leverage on firm performance. And firms that had some foreign debt financing performed better than their counterparts.

Measuring beta is a popular method used in many models such as the famous CAPM model. The Viet Nam tourism industry is selected for the research because until now there is no research published with the same scope and because Viet Nam tourism industry is considered as one of active economic sectors in local financial markets, which has some positive effects for the economy. The purpose of this study, therefore, to find out how much market risk for this industry in changing contexts of financial leverage.

We mention some issues on the estimating of impacts of external financing on beta for listed tourism industry companies in Viet Nam stock exchange as following:

Issue 1: Whether the risk level of tourism industry firms under the different changing scenarios of leverage increase or

decrease so much.

Issue 2: Whether the disperse distribution of beta values become large in the different changing scenarios of leverage estimated in the tourism industry.

This paper is organized as follow. The research issues and literature review will be covered in next sessions 2 and 3, for a short summary. Then, methodology and conceptual theories are introduced in session 4 and 5. Session 6 describes the data in empirical analysis. Session 7 presents empirical results and findings. Next, session 8 covers the analytical results. Then, session 9 presents empirical results and session 10 presents analysis of risk. Lastly, session 11 shows discussion and session 12 will conclude with some policy suggestions. This paper also supports readers with references, exhibits and relevant web sources.

## **THEORETICAL BACKGROUND**

### **A. Conceptual theories**

#### **The impact of financial leverage on the economy**

Financial development and economic growth are positively interrelated. The interaction between these two (2) fields can be considered as a circle, in which good financial development causes economic growth and vice versa. A sound and effective financial system has positive effect on the development and growth of the economy. Financial institutions and markets can enable corporations to solve liquidity needs and enhance long-term investments. This system include many channels for a firm who wants to use financial leverage or FL, which refers to debt or to the borrowing of funds to finance a company's assets.

In a specific industry such as tourism industry, on the one hand, using leverage with a decrease or increase in certain periods could affect tax obligations, revenues, profit after tax and technology innovation and compensation and jobs of the industry. During and after financial crises such as the 2007-2009 crisis, there raises concerns about the role of financial leverage of many countries, in both developed and developing markets. On the one hand, lending programs and packages might support the business sectors. On the other hand, it might create more risks for the business and economy.

### **B. Methodology**

For calculating systemic risk results and leverage impacts, in this study, we use the live data during the crisis period 2009-2011 from the stock exchange market in Viet Nam (HOSE and HNX and UPCOM). In this research, analytical research method is used, philosophical method is used and specially, leverage scenario analysis method is used. Analytical data is from the situation of listed tourism industry firms in VN stock exchange and current tax rate is 25%. Generally speaking, quantitative method is mainly used in this study with a note that risk measure asset beta is mainly derive from equity beta and financial leverage. Finally, we use the results to suggest policy for both these enterprises, relevant organizations and government.

### **C. Previous Studies**

Fama, Eugene F., and French, Kenneth R., (2004) also indicated in the three factor model that "value" and "size" are significant components which can affect stock returns. They also mentioned that a stock's return not only depends on a market beta, but also



on market capitalization beta. The market beta is used in the three factor model, developed by Fama and French, which is the successor to the CAPM model by Sharpe, Treynor and Lintner. Dimitrov (2006) documented a significantly negative association between changes in financial leverage and contemporaneous risk-adjusted stock returns. Aydemir et al (2006) identified in an economy with more realistic variation in interest rates and the price of risk, there is significant variation in stock return volatility at the market and firm level. In such an economy, financial leverage has little effect on the dynamics of stock return volatility at the market level. Financial leverage contributes more to the dynamics of stock return volatility for a small firm. Then, Maia (2010) stated the main determinants of firms' capital structures are related to firms' sensitivities to these systematic sources of risk and they affect asymmetrically low and high leverage firms. And temporary shocks are relatively more important for low leverage firms, and that financial distress risk seems to be captured by the sensitivity of firms' cash flow innovations to market discount rate news.

Umar (2011) found that firms which maintain good governance structures have leverage ratios that are higher (forty-seven percent) than those of firms with poor governance mechanisms per unit of profit. Chen et al (2013) supported regulators' suspicions that over-reliance on short-term funding and insufficient collateral compounded the effects of dangerously high leverage and resulted in undercapitalization and excessive risk exposure for Lehman Brothers. The model reinforces the importance of the relationship between capital structure and risk management. Then, Alcock et al (2013) found evidence that leverage cannot be viewed as a long-term strategy to enhance performance, but in the short term, managers do seem to add significantly to fund excess returns by effectively timing leverage

choices to the expected future market environment. And Gunaratha (2013) revealed that in different industries in Sri Lanka, the degree of financial leverage has a significant positive correlation with financial risk. Finally, financial leverage can be considered as one among many factors that affect business risk of consumer good firms.

## **EMPIRICAL ANALYSIS**

### **A. General Data Analysis**

The research sample has total 10 listed firms in the tourism industry market with the live data from the stock exchange.

Firstly, we estimate equity beta values of these firms and use financial leverage to estimate asset beta values of them. Secondly, we change the leverage from what reported in F.S 2011 to increasing 30% and reducing 20% to see the sensitivity of beta values. We found out that in 3 cases, asset beta mean values are estimated at 0,514, 0,377 and 0,098 which are sensitive and decrease with the leverage. Also in 3 scenarios, we find out equity beta mean values (0,765, 0,663 and 0,831) are negatively correlated with the leverage. Leverage degree changes definitely has certain effects on asset and equity beta values.

### **B. Empirical Research Findings and Discussion**

In the below section, data used are from total 10 listed tourism industry companies on VN stock exchange (HOSE and HNX mainly). In the scenario 1, current financial leverage degree is kept as in the 2011 financial statements which is used to calculate market risk (beta). Then, two (2) FL scenarios are changed up to 30% and down to 20%, compared to the current FL degree. Market risk (beta) under the impact of tax rate, includes:

1) equity beta; and 2) asset beta. B.1 Scenario 1: current financial leverage (FL) as in financial reports 2011. In this case, all beta values of 10 listed firms on VN tourism industry market as following.

Table 1. Market risk of listed companies on VN tourism industry market

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (F.S reports)
1	CTC	0,226	0,072		68,1%
2	DLC	0,475	0,281	DLV as comparable	40,7%
3	DLV	0,719	0,264	PGT as comparable	63,3%
4	FDT	0,764	0,300	PGT as comparable	60,7%
5	HOT	1,447	1,222	PGT as comparable	15,6%
6	PDC	2,035	1,298		36,2%
7	PGT	1,648	1,532		7,1%
8	TCT	1,016	0,913		10,1%
9	TTR	-1,060	-0,888		16,3%
10	MAS	0,382	0,143		62,6%
				Average	38,07%

(source: Viet Nam stock exchange 2012)

B.2. Scenario 2: financial leverage increases up to 30%

If leverage increases up to 30%, all beta values of total 10 listed firms on VN tourism industry market as below.

Table 2 – Market risks of listed tourism industry firms (case 2)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (30% up)
1	CTC	0,290	0,033		88,5%
2	DLC	0,200	0,094	DLV as comparable	52,9%
3	DLV	0,368	0,065	PGT as comparable	82,3%
4	FDT	0,433	0,091	PGT as comparable	78,9%
5	HOT	1,384	1,104	PGT as comparable	20,3%
6	PDC	2,035	1,077		47,0%
7	PGT	1,648	1,497		9,2%
8	TCT	0,660	0,573		13,2%
9	TTR	-1,060	-0,836		21,2%
10	MAS	0,382	0,071		81,4%
				Average	49,5%

(source: Viet Nam stock exchange 2012)

B.3. Scenario 3: leverage decreases down to 20%

If leverage decreases down to 20%, all beta values of total 10 listed firms on the tourism industry market in VN as following.

Table 3 – Market risk of listed tourism industry firms (case 3)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (20% down)
1	CTC	0,545	0,062		54,5%
2	DLC	0,326	0,153	DLV as comparable	32,6%
3	DLV	0,506	0,090	PGT as comparable	50,6%
4	FDT	0,486	0,102	PGT as comparable	48,6%
5	HOT	0,125	0,099	PGT as comparable	12,5%
6	PDC	0,290	0,153		29,0%
7	PGT	0,056	0,051		5,6%
8	TCT	0,081	0,070		8,1%
9	TTR	0,130	0,103		13,0%
10	MAS	0,501	0,093		50,1%
				Average	30,5%

*(source: Viet Nam stock exchange 2012)*

All three above tables and data show that values of equity and asset beta in the case of increasing leverage up to 30% or

decreasing leverage degree down to 20% have certain fluctuation.

C. Comparing statistical results in 3 scenarios of changing leverage:

Table 4 - Statistical results (FL in case 1)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,035	1,532	0,5029
MIN	-1,060	-0,888	-0,1727
MEAN	0,765	0,514	0,2513
VAR	0,7530	0,5302	0,2228
Note: Sample size : 10			

*(source: Viet Nam stock exchange 2012)*

Table 5 – Statistical results (FL in case 2)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,035	1,497	0,5378
MIN	-1,060	-0,836	-0,2245
MEAN	0,634	0,377	0,2569
VAR	0,7673	0,4725	0,2948
Note: Sample size : 10			

*(source: Viet Nam stock exchange 2012)*

Table 6- Statistical results (FL in case 3)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,545	0,153	0,3915
MIN	0,056	0,051	0,0052
MEAN	0,305	0,098	0,2067
VAR	0,0383	0,0012	0,0371
Note: Sample size : 10			

*(source: Viet Nam stock exchange 2012)*

Based on the above results, we find out: Equity beta mean values in all 3 scenarios are low ( $< 0,8$ ) and asset beta mean values are also small ( $< 0,6$ ). In the case of reported leverage in 2011, equity beta value fluctuates in an acceptable range from -1,060 (min) up to 2,035 (max) and asset beta fluctuates from -0,888 (min) up to 1,532 (max). If leverage increases to 30%, equity beta moves in an unchanged range and asset beta moves from -0,836 (min) up to 1,497 (max). Hence, we note that there is an increase in asset beta min value if leverage increases. When leverage decreases down to 20%, equity beta value moves in a range between 0,056 and 0,545 and asset beta changes from 0,051 (min) up to 0,153 (max). So, there is an increase in equity beta min value and increase in asset beta min when leverage decreases in scenario 3.

Beside, Exhibit 4 informs us that in the case 30% leverage up, average equity beta value of 10 listed firms decreases down to -0,131 while average asset beta value of these 10 firms decreases little less to -0,137. Then, when leverage reduces to 20%, average equity beta value of 10 listed firms goes down little more to -0,46 and average asset beta value of 10 firms up to -0,416.

The below chart 1 shows us : when leverage degree decreases

down to 20%, average equity and asset beta values decrease to 0,305 and 0,098 compared to those at the initial reported leverage (0,765 and 0,514). Then, when leverage degree increases up to 30%, average equity beta decreases little less and average asset beta value also decreases less (to 0,634 and 0,377). However, the fluctuation of equity beta value (0,767) in the case of 30% leverage up is higher than (>) the results in the rest 2 leverage cases. And we could note that the using of leverage in the case of 30% leverage up causes a decrease in asset beta var down to 0,473 (compared to 0,530).

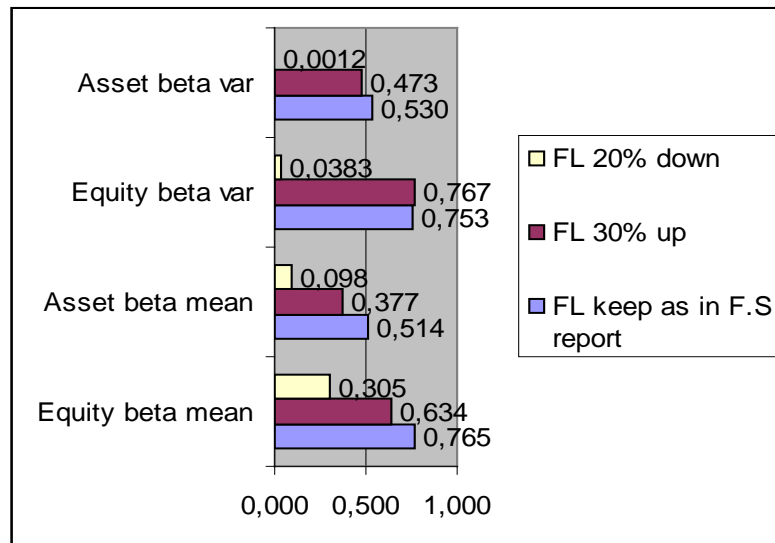
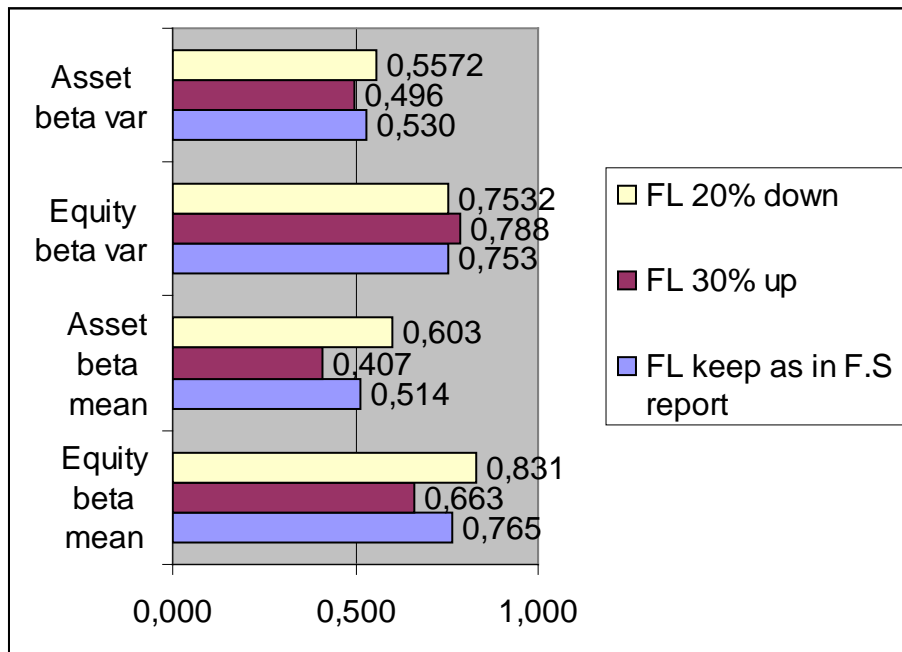


Figure 1 – Comparing statistical results of three (3) scenarios of changing FL (period 2009-2011)





(source: Viet Nam stock exchange 2012)

Figure 2 – Comparing statistical results of three (3) scenarios of changing FL (period 2007-2011)

#### D. Empirical results

In scenario 1 (current FL), asset and equity beta mean reach the highest values (0,514 and 0,765) whereas asset beta var also reaches maximum (0,530), compared to the rest 2 cases. In scenario 2 (FL 30%), asset and equity beta min reach medium values (0,377 and 0,634) whereas equity beta var reaches maximum (0,767), compared to the rest 2 cases.

And finally, in scenario 3 (FL down 20%), asset and equity beta mean reach minimum values while asset beta var reaches minimum value also (0,098 and 0,305), compared to the rest 2 cases.

### **E. Risk analysis**

In short, the using of financial leverage could have both negatively or positively impacts on the financial results or return on equity of a company. The more debt the firm uses, the more risk it takes. Beside, the increasing interest on loans might drive the earning per share (EPS) lower. On the other hand, in the case of increasing leverage, the company will expect to get more returns. The financial leverage becomes worthwhile if the cost of additional financial leverage is lower than the additional earnings before taxes and interests (EBIT). Considering risk vs. return, FL becomes a decisional variable for managers. And the maximum risk that a firm accepts will ask for the maximum financial leverage.

### **F. Discussion**

Looking at exhibit 6, it is noted that in case leverage up 30%, comparing to beta results of consumer good industry, asset and equity beta mean (0,407 and 0,663) of tourism industry are higher than those of consumer good industry (0,222 and 0,630). This relatively shows us that financial leverage might affect asset beta values in consumer good industry much more than that in tourism industry although it does has certain impacts.

## **CONCLUSION**

In general, the government has to consider the impacts on the

mobility of capital in the markets when it changes the macro policies. Beside, it continues to increase the effectiveness of building the legal system and regulation supporting the plan of developing electric power market. The Ministry of Finance continues to increase the effectiveness of fiscal policies and tax policies which are needed to combine with other macro policies at the same time. The State Bank of Viet Nam continues to increase the effectiveness of capital providing channels for tourism companies as we could note that in this study when leverage is going to increase up to 30%, the risk level decreases little less as well as the asset beta var, compared to the case it is going to decrease down to 20%. And for the corporations, figure 2 tells us that decreasing leverage in the period 2009-2011 helps to reduce risk more than that in the 2007-2011 period. Furthermore, the entire efforts among many different government bodies need to be coordinated. Finally, this paper suggests implications for further research and policy suggestion for the Viet Nam government and relevant organizations, economists and investors from current market conditions.

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Appendix 1. Interest rates in banking industry during crisis (*source: Viet Nam commercial banks*)

Year	Borrowing Interest rates	Deposit Rates	Note
2011	18%-22%	13%-14%	
2010	19%-20%	13%-14%	Approximately (2007: required reserves ratio at SBV is changed from 5% to 10%) (2009: special supporting interest rate is 4%)
2009	9%-12%	9%-10%	
2008	19%-21%	15%-16,5%	
2007	12%-15%	9%-11%	

Appendix 2. Basic interest rate changes in Viet Nam (*source: State Bank of Viet Nam and Viet Nam economy*)

Year	Basic rate	Note
2011	9%	
2010	8%	
2009	7%	
2008	8,75%-14%	Approximately, fluctuated
2007	8,25%	
2006	8,25%	
2005	7,8%	
2004	7,5%	
2003	7,5%	
2002	7,44%	
2001	7,2%-8,7%	Approximately, fluctuated
2000	9%	

Appendix 3. Inflation, GDP growth and macroeconomics factors (*source: Viet Nam commercial banks and economic statistical bureau*)

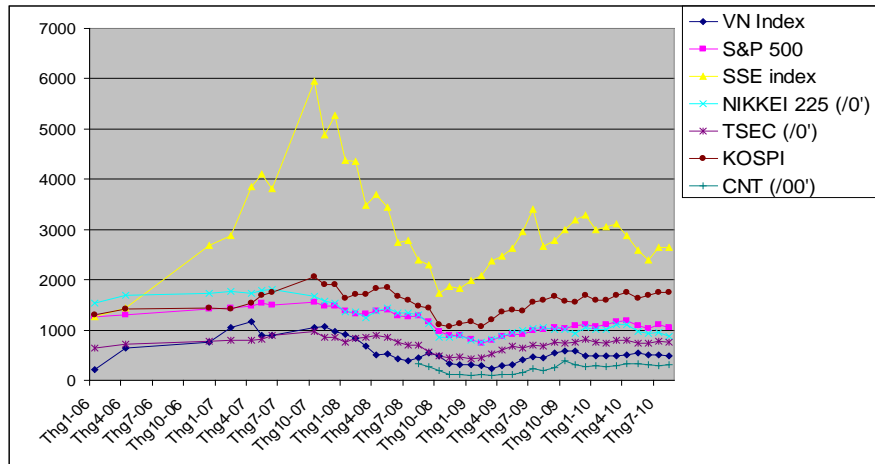
Year	Inflation	GDP	USD/VND rate
2011	18%	5,89%	20.670
2010	11,75% (Estimated at Dec 2010)	6,5% (expected)	19.495
2009	6,88%	5,2%	17.000
2008	22%	6,23%	17.700
2007	12,63%	8,44%	16.132
2006	6,6%	8,17%	
2005	8,4%		
Note	approximately		

Appendix 4. Increase/decrease risk level of listed tourism industry firms under changing scenarios of leverage : in 2011 F.S reports, 30% up, 20% down in the period 2009 – 2011 (*source: Viet Nam stock exchange 2012*)

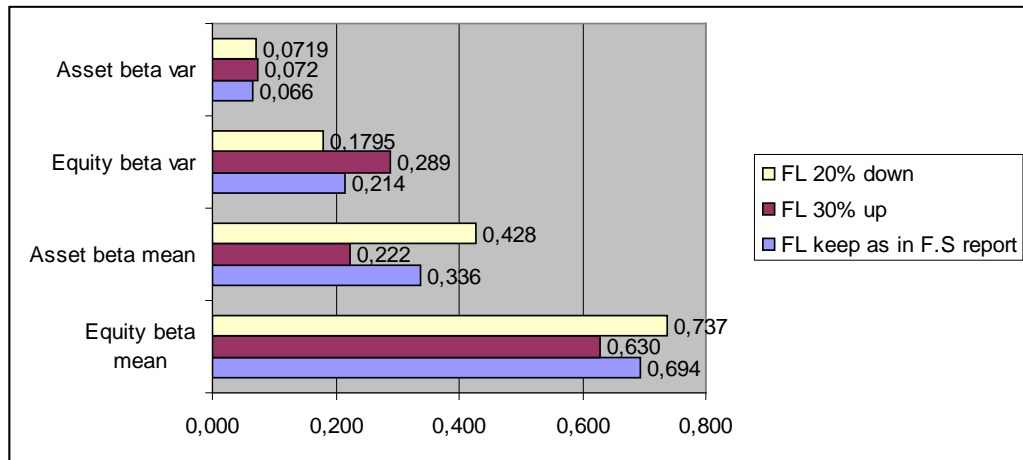
Order No.	Co. stock code	FL keep as in F.S report		FL 30% up		FL 20% down	
		Equity beta	Asset beta	Increase /Decrease (equity beta)	Increase /Decrease (asset beta)	Increase /Decrease (equity beta)	Increase /Decrease (asset beta)
1	CTC	0,226	0,072	0,064	-0,039	0,319	-0,010
2	DLC	0,475	0,281	-0,275	-0,187	-0,149	-0,128
3	DLV	0,719	0,264	-0,351	-0,199	-0,213	-0,174
4	FDT	0,764	0,300	-0,331	-0,209	-0,278	-0,198
5	HOT	1,447	1,222	-0,063	-0,118	-1,323	-1,122
6	PDC	2,035	1,298	0,000	-0,221	-1,745	-1,145
7	PGT	1,648	1,532	0,000	-0,035	-1,591	-1,480
8	TCT	1,016	0,913	-0,356	-0,340	-0,935	-0,843

9	TTR	-1,060	-0,888	0,000	0,052	1,191	0,990
10	MAS	0,382	0,143	0,000	-0,072	0,119	-0,050
		Avg		-0,131	-0,137	-0,460	-0,416

Appendix 5. VNI Index and other stock market index during crisis 2006-10



Appendix 6. Comparing statistical results of three (3) scenarios of changing FL of 121 listed firms in the consumer good industry (source: Viet Nam stock exchange 2012)



**Author note:** My sincere thanks are for the editorial office and Lecturers/Doctors at Banking University and International University of Japan. Through the qualitative analysis, please



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