



# SCMS JOURNAL OF

## INDIAN MANAGEMENT

ISSN 0973 - 3167

Volume XVII Number 4  
October - December 2020

In UGC Care A list

**Scopus®**

**Regression Based Inflation Forecasting: Evidences from GCC Countries**

*Salim Bagadeem*

**EBSCO**

**Investment Strategies and Random Walk Hypothesis: South Asia**

*Ruchika Gahlot*

**Service Quality: Business Incubation and Supportive Policy Intervention**

*Nazia Sultana and Nidhi Gupta*



**Disruptive Human Resource Practices: Agile Firms**

*Selvam Jesiah and Murugaiyan Pachayappan*

**Employees' Intention to Stay: Mediating Role of Work-Life Balance**

*P. Prasanthi and Geevarghese,*

**Gamification : Increasing Electronic Word of Mouth in Tourism**

*Manju. M, Richa Saxena and Mallika Srivastava*



**Human Resource Disclosure Practices: Corporate Sector**

*Anju Verma and Kirti Aggarwal*



**Predictor of Customer Trust: Role of Technology**

*Rajiv Sindhwani*

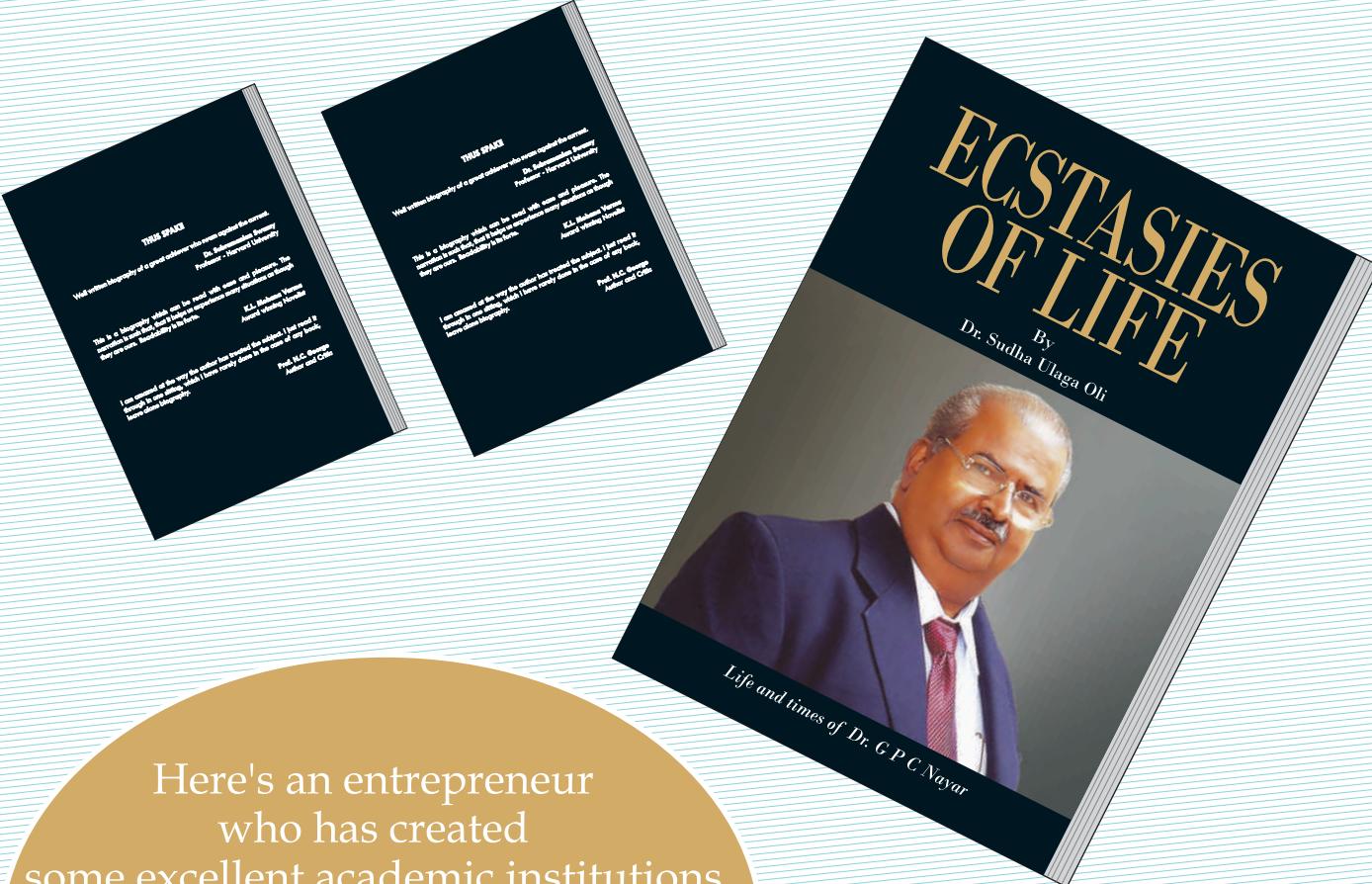
**Banking: e-Route Challenges in Oman**

*Nadia Sha, Gabriel Simon Thattil and Shariq Mohammed*

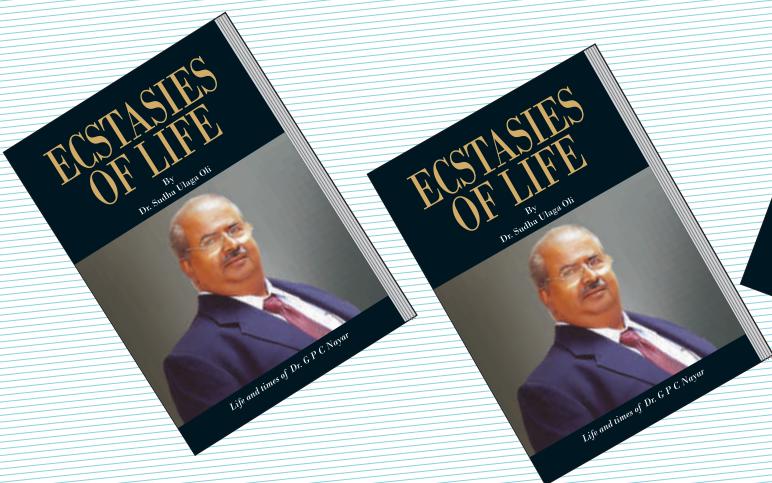
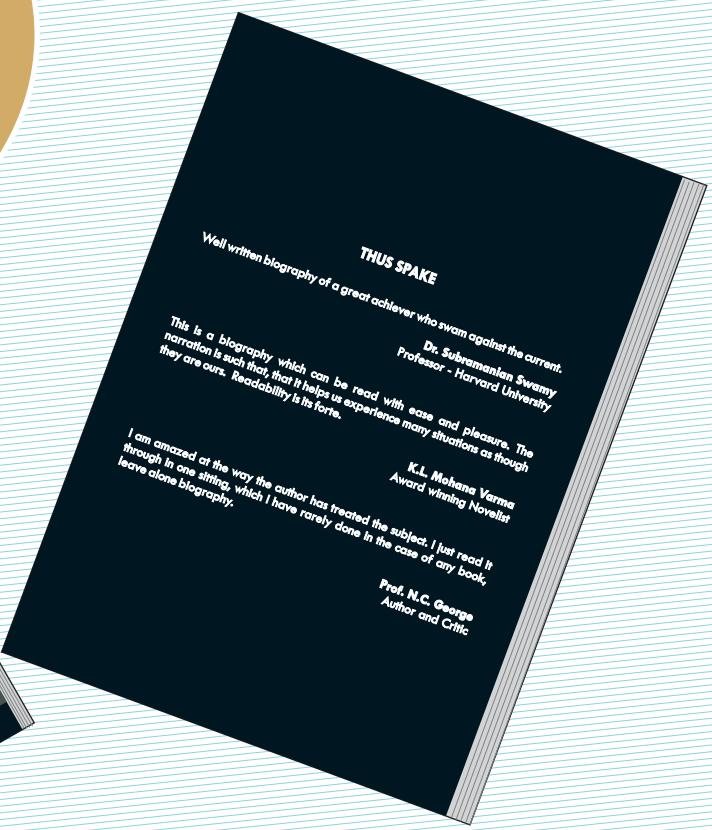


**Size Effect in Indian Equity Market : Discriminant Analysis**

*Deepak Danak and Riya Shah*



Here's an entrepreneur  
who has created  
some excellent academic institutions  
in an unfriendly environment.  
It is a saga of trials and tribulations  
in an extremely readable manner  
by a consummate  
writer in English.



Copies can be had from the Publication Department, SCMS Group of Educational Institutions, Cochin-683106.

# Contents

October - December 2020, Vol. XVII, Issue No. 4

## Articles

5. **Regression Based Inflation Forecasting: Evidences from GCC Countries**  
*Salim Bagadeem*
13. **Investment Strategies and Random Walk Hypothesis: South Asia**  
*Ruchika Gahlot*
30. **Service Quality: Business Incubation and Supportive Policy Intervention**  
*Nazia Sultana and Nidhi Gupta*
38. **Disruptive Human Resource Practices: Agile Firms**  
*Selvam Jesiah and Murugaiyan Pachayappan*
44. **Employees' Intention to Stay: Mediating Role of Work-Life Balance**  
*P. Prasanthi and Geevarghese,*
51. **Gamification : Increasing Electronic Word of Mouth in Tourism**  
*Manju. M, Richa Saxena and Mallika Srivastava*
63. **Human Resource Disclosure Practices: Corporate Sector**  
*Anju Verma and Kirti Aggarwal*
77. **Predictor of Customer Trust: Role of Technology**  
*Rajiv Sindwani*
89. **Banking: e-Route Challenges in Oman**  
*Nadia Sha, Gabriel Simon Thattil and Shariq Mohammed*
106. **Size Effect in Indian Equity Market : Discriminant Analysis**  
*Deepak Danak and Riya Shah*





## Chairman's Overview

Controlling inflation is a major issue for any central bank while deciding the monetary policy, but forecasting inflation is even a bigger challenge. Like any other region, forecasting and managing inflation are also critical for the gulf region. Our lead article applies regression-based forecasting of inflation for selected GCC countries based on economic growth, imports and foreign exchange rates.

Our second lead is a study of weak-form efficiency of South Asian stock market from 2015 to 2018 in the form of random walk by considered daily closing prices of DSE, Nifty 50, MASIX, NEPSE, KSE-100 and CSE. Both parametric and nonparametric tests are applied for testing weak-form efficiency. The results suggested that all south Asian stock market are inefficient in weak form except India and Maldives. It means that investors will be able to consistently earn abnormal gains by analyzing the historical prices in Nepal, Pakistan, Bangladesh and Sri Lanka. This study will help investors to create and manage an investment portfolio in these South Asian countries as inefficiency in the market can lead to abnormal profits to them.

The third article in this issue presents a conceptual model to assess the service quality of business incubators. It identifies the service quality dimensions and suggests to match the tenant/start-up firm's perception with incubator's service design, delivery and differentiation. This study has managerial implications facilitating the incubators to adjust their value proposition to incorporate changing paradigms of the entrepreneurial ecosystem.

We also feature a number of research articles in this issue on a wide range of topics such as Disruptive Human Resource Practices: Agile Firms, Employees' Intention to stay: Mediating Role of Work-life Balance, Gamification: Increasing Electronic Word of Mouth in Tourism, Human Resource Disclosure Practices: Corporate Sector, Predictor of Customer Trust: Role of Technology and the like.

I am confident that this issue will be truly informative and educative to our readers.

**Dr. G. P. C. NAYAR**  
Chairman, SCMS Group of Educational Institutions.

# SCMS Journal of Indian Management

A Quarterly Publication of  
SCMS-COCHIN

## Editors

Editor-in-Chief  
**Dr. G. P. C. Nayar**  
Chairman  
SCMS Group of Educational Institutions

Editor  
**Dr. Radha Thevannoor**  
Registrar and Group Director  
SCMS Group of Educational  
Institutions

## Editorial Board

**Dr. Subramanian Swamy**  
PhD (Economics, Harvard University)  
Formerly Union Cabinet Minister of Commerce,  
Law & Justice, Formerly Professor of Economics  
IIT, Delhi & Department of Economics,  
Harvard University, USA

**Dr. Jose Maria Cubillo-Pinilla**  
Director of Marketing Management  
ESIC Business and Marketing School  
Madrid, Spain

**Dr. Naoyuki Yoshino**  
Professor of Economics  
Keio University  
Tokyo, Japan

**Dr. I.M. Pandey**  
Professor of Research  
Delhi School of Business  
New Delhi

**Dr. George Sleeba**  
Joint Mg. Director, V Guard  
Industries Ltd., Kochi

**Mr. Jiji Thomson IAS**  
Formerly Chief Secretary  
Kerala

**Dr. Azhar Kazmi**  
Professor, King Fahd University  
of Petroleum and Minerals  
Dhahran, Saudi Arabia

**Dr. Thomas Steger**  
(Chair of Leadership and Organization)  
Faculty of Business, Economics and  
Management Indoraction System  
University of Regensburg  
Germany

**Dr. Mathew J. Manimala**  
Formerly Professor  
Indian Institute of  
Management, Bangalore

**Dr. Kishore G. Kulkarni**  
Distinguished Professor of Economics and Editor  
Indian Journal of Economics and Business  
Denver, US

**Dr. Abhilash S. Nair**  
Co-ordinator  
Management Development Programs  
IIM (K), Kochi Campus, Kerala

## Editorial



# Workplace Transformation



The word 'lockdown', which is Collins Dictionary's word of the year, summarises the agony that the world underwent in 2020.

The pandemic has transformed our lives and work culture forever. Workplace transformation was one of the most important happenings in this era. A workplace transformation is the rethinking of flexible workspaces to accommodate different kinds of work, workers, and technology.

The coronavirus accelerated the most significant workplace transformations of our lifetime. It changed the way we work, exercise, shop, learn, communicate, and the place we work.

As we enter a new, seemingly chaotic year, there is every expectation that the wave of disruption and the uncertainty may prevail for some more time.

The pandemic has brought in new kind of challenges, which many leaders have never faced before. Traditional problem-solving methods may not help to reach solutions in this "new normal." HR leaders need to adjust and develop new strategies. Many organisations introduced remote working for the first time.

Majority of the workforces, particularly knowledge workers, people who work in offices, have migrated into remote work. Many people for the very first time in their professional lives have attempted to get the job done virtually, collaborate virtually, and work with partners, customers, consumers, distributors and suppliers virtually. This situation forced organisations to transform digitally. Remote work needs robust enabling technologies to support it – communication tools, the tools for cybersecurity, repositories, content management systems etc. Digital transformation can be faster if the workplace is also designed to accelerate the transformation process. A digital workplace will absorb technology disruptions seamlessly, keep human engagement high, and remain agile to various needs.

The demarcation line between working inside versus working outside the organisation is slowly fading. There is virtually no difference between working from home and office. Companies are open to break walls and allow a back-and-forth flow of people, expertise, and ideas. The formal structure inside organisations is also morphing into more melted configurations. Agility is increasingly becoming paramount. When all these changes merge with the organisation's digital transformation goals, it will not only reshape workspace design but will fundamentally transform the workplace also.

**Dr. Radha Thevannoor**

---

#### Editorial Committee:

##### Co-ordinating Editor:

James Paul

##### Asst. Editors :

Dr. Mohan B.  
Sudheer Sudhakaran

Prof. K. J. Paulose  
Dr. Praveena K.  
Praveen Madhavan

# Regression Based Inflation Forecasting: Evidence from GCC Countries



**Dr Salim Bagadeem**

KSA, Vice Rector of Academic Affair  
Arab Open University, Saudi Arabia  
Email: bagadeem@arabou.edu.sa

## A b s t r a c t

Controlling inflation is a major issue for any central bank while deciding the monetary policy, but forecasting inflation is even a bigger challenge. Just like any other region, forecasting and managing inflation are also critical for the gulf region. This study applies regression-based forecasting of inflation for selected GCC countries based on economic growth, imports and foreign exchange rates. The subject has been less studied in literature and is a novel study considering the sample involved, the tools used and the variables used. This study is an attempt to contribute to the literature on the subject. Different types of regressions (Ordinary Least Squares, Pooled Least Square and Vector Auto Regression) has been used in the analysis along with other standard analysis tools. One of the significant findings of the study is that the Inflation is influenced by imports in the short term and by GDP in the long term. This is an important policy implication.

**Keywords:** *GCC, Inflation, Forecasting, Macro-economic Analysis, Panel Data*

**C**ontrolling inflation is a major issue for any central bank while deciding the monetary policy, but forecasting inflation is even a bigger challenge. Inflation is also considered significant for an economy because it affects the efficiency of an economy through prices and price control. Inflation should follow a range and should neither be too low nor too high, considering its importance to economic stability. Quick acceleration or slump in inflation results in high costs to the public and business community which has economic consequences. A high inflation rate is associated with lower growth and financial crisis, weaker investor confidence and lower real earnings. A low inflation rate may support low wages and poverty measures, but it may reflect low demand and economic slowdown.

Inflation is a major challenge for the central bank while deciding the monetary policy changes to control inflation. Forecasting inflation is not an easy task as several techniques, and numerous parameters are to be considered, local as well as international. A VAR based study was conducted by (Ahmad and Nasrin, 2017) where they found that Repo rate is one of the main monetary policies tools that influences different macroeconomic variables such as economic growth, inflation, foreign direct investments, and foreign exchange rate. The academic literature on inflation has reached a fair range of consensus (Good friend and King, 1997). Despite some contradictory findings regarding the specific causes and channels through which inflation is calculated and its transfusion into the system, it is generally accepted that two primary causes cause inflation, demand (demand pulled) and cost (cost driven) of commodities. If the price rise is attributed to increase in demand or shortfall in supply, it is said that the inflation is demand pulled. If the price rise is because of increase in cost of input factors, it is referred to as cost pushed inflation. The 'price' referred here is the weighted price of a basket of selected commodities used as indicators of inflation. Index numbers are used to measure inflation based on a base year price and current price of the basket of commodities.

Usually, the formulae used in such calculation is,

$$\text{Inflation index} = (100 * \text{Current Price}/\text{Base Price}),$$

This can be generalized as,

$$I_i = 100 * P_i / P_0 \quad \dots(1)$$

In equation 1,  $I_i$  indicates current inflation index,  $P_i$  indicates current prices and  $P_0$  indicates base price.

To illustrate, if the base price in the year 2012 is 96 and the current price is 113, then the current inflation index would be 118 as  $[(100*113)/96]$  and if today's price is 90 then inflation index calculated would be 94,  $[(100*90)/96]$ . This implies that in the first scenario the prices have increased by 18% (118-100) and in the second scenario the prices have decreased by 6% (94-100) between 2012 and today.

*About GCC:* Gulf Cooperation Council (GCC), is a political and economic alliance of six Middle Eastern countries—Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain, and Oman. The GCC was established in Riyadh, Saudi Arabia, in May 1981. The purpose of the GCC is to achieve unity among its members based on their common objectives and their similar political and cultural identities, which are rooted in Arab and Islamic cultures. Presidency of the council rotates annually. (Source: [www.britannica.com](http://www.britannica.com))

The Table 1, includes the latest inflation rates as available at the time of the study. This indicates that the world average for inflation rate (for the year 2018) was 2.4% and except for UAE (3.1%) and KSA (2.5%), the rate was lower for other four countries with lowest being for Qatar (0.3%)

**Table 1: GCC Inflation data**

Inflation (%)		
Country	Year	Value
Bahrain	2018	2.1
Kuwait	2017	2.2
Oman	2018	0.9
Qatar	2018	0.3
Saudi Arabia (KSA)	2018	2.5
United Arab Emirates(UAE)	2018	3.1
World	2018	2.4

(Source: world bank database)

#### **Theoretical construct of the study:**

Demand pulled inflation and cost pushed inflation as two fundamental theories of inflation have provided the theoretical impetus for the research. Considering these theories and the standard tools used for forecasting macroeconomic variables, the research design has been constructed for the research. As per best of author's understanding, hardly any studies were found which has used this methodology. The paper is novel in methodology

as no other paper was found which has used panel data and VAR regression on a sample of GCC countries. Also the paper is novel in scope that the interrelationship of inflation with GDP, foreign exchange rates and imports. Additionally, the data set used is long term (1960-2019) as used by Barro (2013). Amongst the GCC countries, considering the inflation rate for the year 2018, UAE (3.1%) and KSA (2.5%) were found to indicate more than world average inflation rate and Qatar (0.3%) had the lowest inflation rate. Also, UAE and KSA are the two biggest and very distinct economies from the gulf region. Thus, UAE, Saudi Arabia and Qatar have chosen as the sample for the study along with the world averages.

The flow of the paper includes 5 sections, introduction, review of literature, research methodology, data analysis and conclusions.

### **Literature Review**

Research over the past two decades has demonstrated considerable instability and variation in inflation forecasting models, particularly in developed countries (Stock & Watson, 2010). Mixed Data Sampling (MIDAS) regressions to study inflation were used by Ghysels et al. (2005); Andreou et al. (2010) and Das & Majhi (2017). Several aspects of inflation have been studied in literature. Ciccarelli & Mojon(2010) ;West (2008) found that local inflation in OECD countries is importantly driven by a common inflation factor. Mumtaz & Surico (2006); Neely & Rapach (2011) discuss the pass through of international inflation in local inflation. Jones (1986) applied Wald test of Granger causality for the US economy and found evidence of bidirectional causality between wholesale inflation and consumer inflation. Kormendi & McGuire (1985); Barro (2013) have demonstrated a negative effect of inflation on economic growth where Barro (2013) states that for a decrease of 0.2-0.3 % in the GDP of a country, the inflation will increase by 10% for that country. Ahmad & Premaratne (2018); Ahmad & Hossain (2019), studied macroeconomic variables across countries and found out that there is a pass through effect of interest rates on inflation on co-integrated economies.

In literature, there is evidence in all directions for the relationship between inflation and economic growth. One research states that inflation has a neutral effect on growth (Cameron, Hum, & Simpson, 1996), another state there is a positive relationship between inflation and economic

growth (Tobin, 1965) and that the inflation has a negative effect on growth (Saeed, 2007). Sweidan (2004) investigated the nature of the economic growth and inflation relationship in Jordan for the time period 1970–2003. A comprehensive analysis of literature on the subject reveals that some of the important variable which may explain inflation are import prices; wage rates; interest rates; exchange rates; excess money supply; unemployment rate and productivity out of which 'import prices' seem to be most significant, Whyte (2011). Also, the most celebrated method used to examine this relationship is the ordinary least squares (OLS) method (Lucas, 1973). Lagged Inflation along with yields spread is an important predictor of Inflation. Change in inflation may be regressed over change in interest rate to study this relationship. For the GCC region the debt market (based on interest rates) is not developed and the data for the same is not easily available.

### **Research Methodology**

The objective of the research is to forecast and understand inflation and its dynamics with macroeconomic parameters with a focus on Middle Eastern countries and derive some novel information, specifically for the Gulf Cooperation Council (GCC) region and generally for the world economy.

The sample includes the countries UAE, Saudi Arabia and Qatar. The variables include GDP, imports, foreign exchange rates and their world averages. The time period of the data used is 1960-2019 and the frequency as annual.

This paper is novel in methodology as no other paper was found which has used Panel data and Vector Auto Regression (VAR) techniques, together, on a sample of GCC countries. Although, inflation and economic growth have been studied to a great extent in literature but another novelty of the paper is the interrelationship of inflation with Imports and foreign exchange rates. Here, GDP is considered as a factor of domestic production (used as a proxy for demand) and imports and exchange rates considered as a proxy for cost, thus covering the two important factors of inflation, demand and cost.

Lucas (1973) and Bhatia (1960) used bivariate Ordinary Least Square (OLS) for economic growth and inflation. The analytical tools for the study include OLS based regression analysis for individual countries and individual variables, Vector Auto Regression techniques (VAR) and Panel data regression for the sample. Data availability for

macroeconomic parameters for Middle East countries is a challenge and techniques have been moderated as per the nature and size of data available for selected parameters. Also descriptive analysis, correlation analysis and causality tests have been done for robustness of the analysis. The software used for analysis are EViews 11.0 and Gretl 2020 version.

The variables used in the research are explained here as per the definitions from [www.databank.worldbank.org](http://www.databank.worldbank.org), the source of the data.

Inflation (used as *Inf* in analysis) is as measured by the consumer price index reflecting the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services.

Annual growth rate of imports (used as *Impart* in analysis) of goods and services is based on the constant local currency

and on constant 2010 U.S. dollars. Imports of goods and services represent the value of all goods and other market services received from the rest of the world.

Annual percentage growth rate of Gross Domestic Product (used as *GDP* in analysis) is as measured at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.

Foreign currency exchange rate (used as *ER* in analysis) is the local currency rate per US Dollar.

#### **Data Analysis and Discussions:**

The Table 2 explains the structure of the panel data used.

**Table 2: Panel data structure used**

Country	Year	GDP	Imports	Inf	ER
UAE	1960-2019	*	*	*	*
Qatar	1960-2020	*	*	*	*
Saudi Arabia	1960-2021	*	*	*	*
World	1960-2022	*	*	*	*

The Table 3 indicates the selected descriptive statistics of the variables in the panel. The Coefficient of Variation (CV) is highest and equal for GDP and imports (163%), followed by inflation (131%) while it is much lower for exchange rates

(9%) indicating extreme fluctuations in GDP, imports and inflation for the sample (1960-2019). The CV may also be used to understand stability of variables and inflation is found volatile with a variation of 131%.

**Table 3: Descriptive statistics for panel data (Source: author's calculations)**

	ER	GDP	IMPORT	INF
Mean	3.84	4.96%	7.91%	4.00%
CV	9%	163%	163%	131%
Skewness	1.62	1.90	1.40	2.87
Kurtosis	4.37	14.51	6.66	15.32

**Table 4: Correlations amongst the panel data variables (Source: author's calculations)**

	ER	GDP	IMPORTS	INF
ER	1.00	-0.38	-0.17	-0.14
GDP	-0.38	1.00	0.45	0.41
IMPORTS	-0.17	0.45	1.00	0.41
INF	-0.14	0.41	0.41	1.00

The Table 4, indicates the Pearson's correlation coefficients for the panel data. The correlation for inflation is same with

GDP and imports (41%), indicating equal and similar directional effect of GDP and imports on inflation.

**Table 5: Results of causality tests (lag 2), (Source: author's calculations)**

Null Hypothesis:	N	P-value
GDP does not Granger Cause ER	105	0.002
ER does not Granger Cause GDP		0.051
IMPRT does not Granger Cause ER	46	NA
ER does not Granger Cause IMPRT		NA
INF does not Granger Cause ER	99	0.142
ER does not Granger Cause INF		0.000
IMPRT does not Granger Cause GDP	92	0.056
GDP does not Granger Cause IMPRT		0.007
INF does not Granger Cause GDP	109	0.872
GDP does not Granger Cause INF		0.031
INF does not Granger Cause IMPRT	76	0.054
IMPRT does not Granger Cause INF		0.001

The causality amongst the variables was tested (Table 5) for the panel data using pairwise Granger Causality tests (Granger, 1988). Analyzing Table 5, causality at 5% confidence level was observed for GDP causing ER, inflation and imports; ER and imports also causing Inflation. Thus, it is inferred that GDP, ER and imports causes (affects) inflation and this relationship was found to be significant also.

Bivariate Pooled OLS was performed (equation 2,3,4) with inflation as dependent variables and ER, GDP and imports individually as independent variables and then multivariable pooled OLS (equation 5) was performed taking all independent variables, together.

$$\text{Inflation} = 15.71 - 3.2 * \text{ER} \quad \dots (2)$$

In equation 2, with ER as the independent variable, the regression was found as not significant at 5% and R-square was observed at 1.9% only. ER has a negative beta coefficient, indicating an inverse relationship with inflation.

$$\text{Inflation} = 3.71 + 0.1 * \text{GDP} \quad \dots (3)$$

In equation 3, with GDP as the independent variable, the regression was found significant at 10% and R-square was observed at 2.6% only. GDP was found to have a positive beta coefficient. (same as for correlation)

$$\text{Inflation} = 3.69 + 0.07 * \text{imports} \quad \dots (4)$$

In equation 4, with imports as the independent variable, the regression was found significant at 5% and R-square was observed at 6.8% only. Imports had a positive beta coefficient (same as for correlation)

$$\text{Inflation} = -4.69 + 1.67 * \text{ER} + 0.19 * \text{GDP} + 0.07 * \text{imports} \quad (5)$$

In equation 5, with ER, GDP and imports as the independent variable, the multivariable regression was found significant at 5% confidence while GDP and imports were found significant at 10% confidence. Also, ER coefficient becomes positive (which was negative in univariate regression) when used along with GDP and imports. The R-square also improved to 23% indicating that together GDP, ER and imports have a better explanatory power than individually.

### **Panel data regressions:**

To analyze for fixed effects or random effects in the panel data, Hausman test was conducted which indicated that random effects would be more appropriate for this panel. Thus, bivariate panel regression is performed with ER, GDP and imports as independent variables, each separately, under random effects (equation 6,7,8). Multivariate pooled regression (FE or RE) could not be performed because of data insufficiency.

$$\text{Inflation} = 17.5 - 3.78 * \text{ER} \quad \dots(6)$$

The equation 6 was found not significant with R-square at 2.4%.

$$\text{Inflation} = 3.61 + 0.12 * \text{GDP} \quad \dots(7)$$

The equation 7 was found significant with GDP at 5% and insignificant regression ( $p\text{-value} = 0.12$ ) with R-square at 6.2%).

$$\text{Inflation} = 3.59 + 0.09 * \text{imports} \quad \dots(8)$$

The equation 8 was found to be significant at 1% confidence level with R-square value at 21%.

Subsequently, VAR system was performed using Sims (1980) at a lag of 3, based on Akaike Information Criterion (Akaike,1981). Since inflation is the focus of the study, only the inflation equation was taken for further analysis (Table 6). The VAR system was found to be significant at 1% confidence level with R-square at 69%. No Autocorrelation (DW is 2.15) and No Heteroskedasticity was found in the regression. Also, inflation at lag 1 ( $\text{Inf\_1}$ ) was found significant at 5% and GDP at lag 3 ( $\text{GDP\_3}$ ) was found significant at 10% confidence level.

**Table 6: VAR system results  
(Dependent variable: Inflation)**

Variable	Coefficients	p-value
constant	-1.67	0.33
Inf_1	0.55	0.02
Inf_2	0.24	0.42
Inf_3	0.04	0.86
Imprt_1	0.03	0.87
Imprt_2	0.15	0.45
Imprt_3	-0.32	0.11
GDP_1	0.57	0.44
GDP_2	-0.89	0.28
GDP_3	1.32	0.09

The Forecast Error Variance Decomposition (FEVD) analysis for Inflation indicated that the effect of imports on inflation increased from the second year onwards while the GDP effects became substantial (more than 1%) only from fourth year onwards. The Impulse Responses Function (IRF) is also applied where a one-standard error shock of imports on inflation indicated the effect in second year which marginally reduced in third year and then diminished further with a one off correction in sixth year. The impulses on inflation to a one-standard error shock of GDP indicated fluctuation in initial years which increased in subsequent years. Thus, it can be validated that the effect of imports on inflation is in short term to medium term while the effect of GDP is in long term and both these effects are positive. This also gets validated from the analysis of forecasted error decomposition results.

Multivariate OLS was also run for individual sample countries (equation 9,10,11,12). Foreign exchange rate was not used as independent variable for respective countries because of multicollinearity effect with other independent variables.

### **Kingdom of Saudi Arabia (KSA):**

$$\text{Inflation} = 1.98 + 0.2 * \text{GDP} - 0.01 * \text{imports} \quad \dots(9)$$

For KSA, the R-square value was found as 7% with the regression being observed as insignificant, even at 10% confidence level.

### **Qatar:**

$$\text{Inflation} = -0.07 + 0.26 * \text{GDP} + 0.09 * \text{imports} \quad \dots(10)$$

For Qatar, the R-square value found as 35% with the regression being observed as significant at 5% confidence level. GDP and imports coefficients are positive.

### **United Arab Emirates (UAE):**

$$\text{Inflation} = 3.4 - 0.37 * \text{GDP} + 0.16 * \text{imports} \quad \dots(11)$$

For UAE, the R-square value found as 24% with the regression being observed as insignificant, even at 10% confidence level.

### **World:**

$$\text{Inflation} = 8.54 - 1.8 * \text{GDP} + 0.44 * \text{imports} \quad \dots(12)$$

For the world averages, the R-square value was found as 10% with the regression being observed as insignificant, even at 10% confidence level. The GDP and imports were

found significant at 10% level and constant at 1% level, respectively, for the same regression.

Overall, it was observed that two multivariate regressions were found significant (Qatar and World) and amongst the two, the contradictory observation was that for the world data, GDP had a negative coefficient with inflation and for Qatar, it had a positive coefficient. This is as per [Tobin, (1965), positive coefficient] and [Saeed (2007), negative coefficient]. Also, the best explanation of inflation, based on country wise regression, was found for Qatar with a R-square value at 35%.

### **Conclusions**

The objective of the research was to understand the dynamics of inflation with economic growth, imports and foreign exchange rates for a sample of GCC countries and with the application of various analytical tools imperative findings emerged which add on to the existing literature.

The most significant finding which emerged was that inflation rate for a country is affected by its imports and economic growth and that the effect of imports is in short to medium term (based on FEVD analysis and Impulse responses) while the effect of economic growth (GDP) is in long term (based on VAR system, FEVD analysis and Impulse responses). The Coefficient of Variation indicated extreme fluctuations in GDP (163%), Imports (163%) and inflation (131%) for the sample during the time period. Additionally, the correlation analysis indicated that the coefficients for inflation is equal and positive with GDP and imports (41%). Validating further, the Granger causality test indicated that at 5% confidence level GDP, ER and imports causes inflation. These are very useful findings from the perspective of policy makers which should be considered for inflation control.

For pooled OLS regression, ER was found to indicate a negative beta coefficient, GDP was found to indicate a positive beta coefficient and imports indicated a positive beta coefficient. Using the three independent variables together (GDP, imports and ER) in multivariate pooled OLS regression, the equation was found to be significant at 5% confidence level, while GDP and imports were found to be significant at 10% confidence level. Also, ER coefficient was found to become positive with an improved R-square value at 23% indicating that together GDP, ER and imports can better explain inflation rather than individually.

The VAR system was found be the most efficient model to forecast inflation based on R-square value of 69%, significance at 1% confidence level, FEVD analysis and impulse shocks. The second-best explanation of inflation, based on country wise bivariate regression, was found for Qatar with R-square value at 35%.

Considering country wise regressions, regressions for Qatar and World were found significant but with one contradictory observation that for the world data, GDP had a negative coefficient with inflation and for Qatar, it had a positive coefficient with inflation.

In subsequent studies, the scope of the research may be extended to include more explanatory variables for inflation and the sample may be extended to include all the GCC countries.

### **References:**

- Ahmad, M. U. and Nasrin, S. (2017). "An analysis of the effect of monetary policy changes on macroeconomic factors," *Theoretical and Applied Economics*, 24(2):303-318
- Ahmad, M.U. and Hossain, M. (2019). "The effect of Low and Negative Interest Rates: Evidence from Indian and Bangladesh," *Journal of International Economics*, 10(1):51-64
- Ahmad, M.U. and Premaratne, H.A.G. (2018). "Effect of Low and Negative Interest Rates: Evidence from Indian and Sri Lankan Economies," *Business Perspective and Research*, 6(2):90-99
- Akaike,H.,(1981). Likelihood of a Model and Information criteria,*Journal of Econometrics*, 16(1):3-14
- Andreou, "E., Ghysels, E. & Kourtellos, A. (2010). Regression models with mixed sampling frequencies, *Journal of Economics*, 158 (2): 246–261
- Barro, R. J. (2013). "Inflation and Economic Growth," *Annals of Economics and Finance*, Society for AEF, 14(1):121-144
- Bhatia, R. J. (1960). "Inflation, deflation and economic development." Staff Paper, *International Monetary Fund*, 8(1):1011–1014.
- Cameron, N.; et al. (1996). "Stylized facts and stylized illusions inflation and productivity revisited." *Canadian Journal of Economics*, 29(1):152–162.

- Ciccarelli, M. and Mojon, B. (2010). Global inflation, *Review of Economics and Statistics*, 92(3):524–535
- Ghysels E. et al. (2005). There is a Risk-return Trade-off after All. *J of Finan Econ*, 76(3): 509–548
- Goodfriend, M. and R. King. 1997. "The New Neoclassical Synthesis and the Role of Monetary Policy," In *NBER Macroeconomics Annual 1997*, edited by B. Bernanke and J. Rotemberg, 231–283. Cambridge: MIT Press.
- Granger, C.W. (1988). "Some recent development in a concept of causality," *Journal of Econometrics*, 39(1-2):199–211
- Jones, J.D. (1986). "Consumer prices, wholesale prices, and causality," *Empirical Economics*, 11(1):41–55
- Kormendi, R.C. and Meguire, P.G. (1985) "Macroeconomic determinants of growth: Crosscountry evidence", *Journal of Monetary Economics*, 16: 141-63
- Lucas, R. (1973). "Some international evidence on output and inflation tradeoff." *American Economic Review*, 63(3): 326–334.
- Maji, B. and Das, A.(2017), "Forecasting inflation with mixed frequency data in India," *Calcutta Statistical Association Bulletin*, 68(1&2):92–110
- Mumtaz, H. and Surico, P. (2012), "Evolving international inflation dynamics: world and country specific factors," *Journal of the European Economic Association*, 10(4):716-734
- Neely,C. and Rapach, D. (2011). International co-movements in inflation rates and country characteristics," *Journal of International Monetary Finance*, 30:1471–1490
- Saeed, A. A. J. (2007). "Inflation and economic growth in Kuwait 1985–2005: Evidence from cointegration and error correction model." *Journal of Applied Econometrics and International Development*, 7(1):143–155.
- Sims, C.A. (1980). "Macroeconomics and reality." *Econometrica*, 48(1): 1–48.
- Stock, J.H. and Watson,M.W. (2010). "Modeling Inflation after the Crisis." *National Bureau of Economic Research Working Paper 16488*
- Sweidan, O. D. (2004). "Does inflation harm economic growth in Jordan? An econometric analysis for the panel 1970–2000," *International Journal of Applied Econometrics and Quantitative Studies*, 1(2): 41–66.
- Tobin, J. (1965). "Money and economic growth." *Econometrica*, 33(4):671–684
- West, K. (2008). Panel data forecasts of inflation and nominal exchange rates, presentation at the workshop on inflation forecasting, Central Bank of Chile, October 2008
- [www.boj.org.jm/uploads/pdf/papers\\_pamphlets/papers\\_pamphlets\\_Modeling\\_the\\_Inflation\\_Rate\\_in\\_Jamaica\\_The\\_Role\\_of\\_Monetary\\_Indicators.pdf](http://www.boj.org.jm/uploads/pdf/papers_pamphlets/papers_pamphlets_Modeling_the_Inflation_Rate_in_Jamaica_The_Role_of_Monetary_Indicators.pdf) (accessed on April 5,2020)
- [www.britannica.com/topic/Gulf-Cooperation-Council](http://www.britannica.com/topic/Gulf-Cooperation-Council) ( accessed on Feb. 8, 2020) [www.databank.worldbank.org](http://www.databank.worldbank.org)
- (accessed on Feb. 8,2020)

\*\*\*\*\*

# Investment Strategies and Random Walk Hypothesis: South Asia



**Dr. Ruchika Gahlot**

Assistant Professor

Department of Business Administration

Maharaja Surajmal Institute, Delhi

Email: ruchikagahlot29@rediffmail.com

## A b s t r a c t

The paper aims to study the weak form efficiency of South Asian stock market from 2015 to 2018 in the form of random walk by considered daily closing prices of DSE, Nifty 50, MASIX, NEPSE, KSE-100 and CSE All Share indices from April 1, 2015 to March 31, 2018. Both parametric and nonparametric tests ("ex-posts" in nature) are applied for testing weak-form efficiency. The parametric tests include ADF unit root test, auto correlation function and Variance ratio test while non parametric tests include PP unit root test, kolmogrov-Smirnov Goodness of test and run test. The results suggested that all south Asian stock market are inefficient in weak form except India and Maldives. It means that investors will be able to consistently earn abnormal gains by analyzing the historical prices in Nepal, Pakistan, Bangladesh and Sri Lanka. The study will help investors to create and manage an investment portfolio in these South Asian countries as inefficiency in market can lead to abnormal profits to them.

**Keywords:** Weak Form Efficiency, Unit Root Test, Variance Ratio Test, South Asian Countries, Auto Correlation.

The concept of an efficient capital market has become one of the important themes in academic literature since the 1960s. The market efficiency has been broken down into three levels by Fama (1970). First, weak form efficiency assumes that all historical market information such as prices, trading volume, and any market oriented information will get reflected in current stock prices. Therefore, investors will not be able to earn abnormal profit by using technical analysis. Second, semi-strong form efficiency assumes that not only the historical information but also all public information will get reflected in current stock prices so that no excess return can be earned by trading on that information. In semi-strong efficient market, both technical and fundamental analysis becomes obsolete in producing abnormal profit. Third, strong-form efficient market in which all information from historical, public, and private sources will get reflected in share prices, so that no investor can earn excess profit. If there are legitimate boundaries to private data getting open, likewise with insider trading laws, strong form efficiency is unattainable, aside from the situation where the laws are generally disregarded. For strong form efficiency, it is important that speculators can not reliably win overabundance returns over an extensive stretch of time. But this form of efficiency is not practically feasible.

An efficient stock market, as per EMH, expected to mirror the promptly accessible data on monetary growth rates, interest rates and the expectation framed from them. Just the unexpected changes in these factors are probably going to produce noticeable changes in the stock costs. If the stock market is informationally efficient with respect to macroeconomic approaches, then stock prices will rapidly fuse any adjustments in the macroeconomic factors, when the data with respect to it turns out to be openly accessible. Past data about these factors is of no utilization in clarifying current changes in stock prices in an efficient market since this data is already included in past prices.

The presence of efficiency has significant ramifications for speculators and fund managers as their trading strategies contrast when returns are portrayed by random walk or by positive autocorrelation over short horizons and negative autocorrelation over long horizon. In the event that market is efficient, no arbitrage strategies can be usurped to make abundance profit as all the accessible data has been discounted in current prices. This examination test weak

form efficiency of stock market. This paper is composed as pursues: The second segment represents a review of literature. Data collection and methodology is outlined in third section. Fourth section deals with results of study. The fifth section provides the summary and conclusion.

### **Literature Review**

Numerous studies are conducted on efficiency of stock market. For the Taiwan stock market, it is demonstrated that the market is efficient in weak form (Fawson et al., 1996; Alam et al., 1999; and Chang and Ting, 2000). So also, the invalid speculation of irregular walk can't be dismissed for the Hong Kong securities exchange (Karemra et al., 1999; Cheung and Coutts, 2001; and Lima and Tabak, 2004). Furthermore, it is demonstrated that securities exchange in the ASEAN region (Indonesia, Malaysia, Thailand and Singapore) pursue the weak form of EMH (Barnes, 1986; Karemra et al., 1999; Alam et al., 1999). In the Southern Asia, researchers revealed that the random walk theory can't be dismissed for stock price changes on the Bombay (India) and Dhaka Stock Exchange (Bangladesh) individually (Sharma and Kennedy, 1977 and Alam et al., 1999). A few investigations bolstered the weak form efficiency of Indian capital market (Rao and Mukherjee, 1971; Sharma and Kennedy, 1977; Barua, 1981; Ramachandran, 1985; Barua and Raghunathan, 1987; Yalawar, 1988; Srinivasan and Narasimhan 1988; Dhankar, 1991; Vaidyanathan and Gali ,1994; Mittal, 1995; Mishra, 2000; Gupta, 2001; and Prusty, 2007).

In the Chinese stock exchanges, Groenewold et al. (2003) reliably found that these markets (Shanghai and Shenzhen stock trades) are weak form efficient. Additionally, Lima and Tabak (2004) found that the B shares index for both Shanghai and Shenzhen Stock Exchange don't pursue the random walk. Notwithstanding, they likewise detailed that the theory of weak form efficiency can't be dismissed for A shares indices of the two exchanges. . In addition, Seddighi and Nian (2004) found that the Shanghai Stock Exchange is weak form efficient for the period from 4th January 2000 to 31st December 2000.

The investigations likewise upheld the suspicion that price changes are arbitrary and past changes weren't helpful in foreseeing future price changes in the USA (Kendall, 1953; Working, 1960; Cootner, 1962; Fama, 1965; Sharpe, 1966; and Williamson 1972). The specialists landed at a similar

end for the U.K. (Hudson et al., 1994; Evans, 2006; Sung and Johnson, 2006). Panas (1990) demonstrated that the Greek securities exchange is efficient at the weak level. Dickinson and Muragu (1994) found that Nairobi stock exchange is efficient.

Abraham et al. (2002) tried the Random Walk Hypothesis (RWH) and market efficiency theory for three Gulf nations, to be specific Saudi Arabia, Kuwait and Bahrain. Their outcomes couldn't dismiss the RWH for Saudi and Bahraini markets, while the Kuwaiti market neglects to pursue random walk, which implies it is wasteful. For Indian capital market, the analysts don't bolster the presence of weak form efficiency (Kulkarni, 1978; Choudhury, 1991; Poshakwale, 1996; Pant and Bishnoi, 2002; Pandey, 2003; Gupta and Basu, 2007; Mishra, 2009 and Mishra and Pradhan, 2009). Smith et al. (2002) dismissed the random walk hypothesis for Egypt, Kenya, Morocco, Nigeria, Zimbabwe, Botswana and Mauritius. The investigations indicated that securities exchange of Turkey and Jordan is inefficient (El-Erian and Kumar, 1995). Barnes (1986) demonstrated that the Kuala Lumpur securities exchange is inefficient. Butler and Malaikah (1992) analyzed Kuwaiti and Saudi Arabian securities exchanges. They found that the Saudi securities exchange is an efficient, though the Kuwaiti Stock Market is an efficient at weak level. Antoniou et al. (1997) contemplated the Istanbul Stock Exchange and saw it as inefficient in the early occasions and efficiency improves as the nation begins advancement and deregulation.

In different examinations everywhere throughout the world, (Jaffe and Westerfield, 1985a and 1985b; Groth et al., 1979; Stickel, 1995; Womack, 1996 and Ho and Harris et al., 1998) it was discovered that the stock market returns were not totally irregular and there existed a pattern which brought about different peculiarities due to non arbitrariness in security returns. Then again, a portion of the examinations (Steeley, 2001) analyzed UK weekend impact and found that these impacts have vanished after a timeframe and subsequently market is efficient.

Fadda (2019) used Variance Ratio test to test Random Walk hypothesis of 11 major indices of world. The study rejected the random-walk-hypothesis, based on the daily closing price from the beginning of 2006 until mid-2016, can be confirmed for two of four analyzed European indexes of

CAC40 and FTSE100, as well as for all four American indexes included in this study (SP500, NASDAQ, DJI, and NYA). On the other hand, German DAX, Spanish IBEX35, and all three Asian Indices of Japanese Nikkei, Chinese HANG SENG, and the Indian BSE30 do not reject the RWH.

Ali et al. (2018) inspected the relative efficiency of 12 Islamic and regular stock market partners utilizing multifractal de-trended fluctuation (MF-DFA). The full example results demonstrate that developed markets are generally more efficient, trailed by the BRICS' securities exchanges. The comparative investigation shows that practically all the Islamic stock markets, excluding Russia, Jordan and Pakistan are more efficient than their traditional partners. Suggesting that Islamic financial exchanges are new, anyway the impossible to miss nature, shari'ah agreeable laws and great administration and exposure components make them more efficient.

Habibah et al. (2017) contemplated RWH in Pakistani equity market by utilizing month to month data of 83 individual stocks classified in 26 segments, covering the period from February 2009 to December 2015. Augmented Dickey Fuller test, Phillip-Perron Test and Run test are applied to test RWH. Discoveries recommend that the KSE-100 stock returns are unsurprising for the premise of past data and the financial specialists can gain the irregular benefit by following the efficient example. At the end of the day, Pakistani securities exchange doesn't mirror the weak form efficiency.

Parulekar (2017) examined weak form of market efficiency for chosen five companies. Five distinct companies from five different sectors are being considered viz. Infosys Limited, Hindustan Unilever Limited, Larsen and Toubro Limited, Mahindra and Mahindra Limited and Sun Pharmaceutical Industries Limited. Measurable tests, for example, "Run Test" and "Autocorrelations" would be utilized to construe from the information. He discovered stock price movement isn't arbitrary in extreme short term especially for companies like Larsen and Toubro Limited and Mahindra and Mahindra Limited. These companies reflect progressively unpredictable segments such as Capital goods and Automobiles as against sectors such as FMCG, IT and Pharma.

Chigozie (2010) analyzed whether Nigerian securities exchange (from the period 1984 to 2006) seeks after random walk by using GARCH model. He found that the Nigerian stock market seeks after random walk and is along these lines weak form efficient except for in the year 1987, the time of monetary deregulation, 1988 when some public organizations were privatized, 1995 the time of internationalization of the market and 2000-2006.

Srinivasan (2010) explored random walk hypothesis for Indian equity market by utilizing ADF and PP test and announced that the Indian securities exchange isn't weak form efficient demonstrating that there is deliberate approach to exploit the trading opportunities and acquire excess profits.

Singh et al. (2010) tried weak form efficiency hypothesis for Indian securities exchange. They utilized information from 1st April 2005 to 31 st March 2007 for Sensex and Nifty by utilizing Serial correlation, unit root, T test and Run test were utilized. The outcome indicated that Indian stock exchange is weak form efficient and price changes pursue random walk.

Oskooe et al.(2010) investigated the random walk hypothesis for Iran Stock Market by applying ADF, PP and KPSS and found that random walk process is followed by the Iran daily stock price index .

Hamid et al. (2010) tried the weak form efficiency in the stock exchange returns of Pakistan, India, Sri Lanka, China, Korea, Hong Kong, Indonesia, Malaysia, Philippine, Singapore, Thailand, Taiwan, Japan and Australia by gathering Monthly data for the period January 2004 to December 2009. Autocorrelation, Ljung-Box Q-statistic Test, Runs Test, Unit Root Test and the Variance Ratio were utilized and found that the month to month prices don't pursue random walk in every one of the nations of the Asian-Pacific region.

Worthington and Higgs (2009) inspected the weak form efficiency of the Australian stock exchange for both day by day returns (6 January, 1958 to 12 April, 2006) and month to month returns (February, 1875 to December, 2005) by utilizing serial correlation, run test, unit root test and multiple variance ratio test. The serial correlation test demonstrated inefficiency in every day returns and marginal efficiency in month to month returns, while the run tests

presumed that both series are weak form inefficient. The unit root test proposed weak form inefficiency in both return series. The variance ratio proposed that month to month returns arrangement is described by a homoscedastic random walk however the day by day arrangement abused weak form efficiency.

Hasanov (2009) reconsidered efficiency of the Australia's and New Zealand's stock exchange by applying the non linear unit root test methodology created by Kapetanios et al. (2003). He inferred that the both securities exchange are not weak form efficient.

Lazar and Nourouli (2009) examined the weak form efficiency of Indian Capital market by using daily returns of S&P CNX Nifty for the period from 3<sup>rd</sup> November, 1994 to 30<sup>th</sup> June, 2008. ADF and PP tests showed weak form efficiency in Indian Capital market.

Abedini (2009) examined the weak form efficiency of stock exchange in the Gulf co-operation council Countries that incorporate Bahrain, Kuwait and Dubai by utilizing the day by day price general index for the period between January, 2005-November, 2008. By utilizing Auto-connection work test and Augmented Dickey-Fuller test, he recommended that efficient market hypothesis could be acknowledged for all the three markets, though efficient market hypothesis couldn't be acknowledged in Runs test. Then again, investigation of Variance ratio indicated that the Dubai financial market is less effective and EMH isn't bolstered by the Bahrain and Kuwait stock exchange. Generally speaking he reasoned that the securities exchange in GCC development is efficient.

Mittal and Jain (2009) contemplated random walk hypothesis on Indian stock exchange for the time of 2007-2008. They utilized run test, T test, unit root test, serial correlation and ANOVA and found that market is informationally efficient.

Awad and Daraghma (2009) analyzed the weak form efficiency of the Palestine Security Exchange (PSE) for 35 stocks by utilizing both parametric and non parametric tests. The outcome indicated that PSE is inefficient at the weak level.

Chander et al. (2008) considered the weak form efficiency for Indian stock market by utilizing week after week prices of 145 group A listed stocks of BSE for period July, 1996 to

December, 2005. Both parametric and non parametric tests detailed that market is efficient in weak form.

Verma and Rao (2007) inspected the weak form efficiency of BSE 100 Index Companies for three years (1998-1999, 1999-2000, and 2000-2001). The inductions drawn from serial correlation and run test showed that for the initial two years, market isn't weak form efficient , yet the consequences of year 2000-2001 demonstrated that the market is weak form efficient. Ahmad et al. (2006) contemplated the Nifty and Sensex for random walk hypothesis by utilizing information for 1994-2004. They applied non parametric test and discovered negative autocorrelation at slack 2 showing over response one day after data appearance, trailed by a correction on the following day. The outcome revealed that market have gotten moderately increasingly inefficient in ongoing periods.

Omran and Farrar (2006) tested the RWH in five Middle Eastern emerging markets (Jordan, Morocco, Egypt, Israel and Turkey) and rejected the RWH for all the markets.

Squalli (2006) tried market efficiency hypothesis in Dubai Financial Market (DFM) and Abu Dhabi Securities Market (ADSM). Variance ratio test dismissed the random walk hypothesis in all sectors of UAE financial market aside from in the banking sector of the DFM. Run test found insurance to be the only weak form efficient sector.

Narayan (2005) applied Caner and Hansen's (2001) unit root test to look at the random walk hypothesis at stock prices of Australia and New Zealand and found that the stock prices in the two nations are portrayed by a unit root, steady with the efficient market hypothesis.

Mishra and Thomas (2005) analyzed the integration and efficiency of Indian stock market and foreign exchange market and reasoned that the weak form market efficient was additionally verified for stock and foreign exchange market.

Cooray and Wickremasinghe (2005) explored the efficiency in the stock market of India, Sri Lanka, Pakistan and Bangladesh and found that weak form efficiency was upheld by the classical unit root tests. In any case, it isn't unequivocally bolstered for Bangladesh under the DF-GLS and ERS tests. The cointegration and Granger causality tests showed a high level of reliance between the South Asian securities exchanges.

Moustafa (2004) examined weak form efficiency of the UAE financial market by utilizing data from 2001 to 2003. He utilized run test and found that most firms are weak form efficient.

Kleiman et al. (2002) investigated weak form efficiency of market for commercial real estate of Europe, Asia and North America. The parametric tests showed that each of these markets exhibits random walk behaviour. The results of non parametric tests provided support for weak form market efficiency in real estate markets.

Fawson et al. (1996) evaluated monthly stock index price of Taiwan stock market for evidences of weak form market efficiency by using binomial distribution, Ljung Box Q test, run test and unit root test. They found that the monthly stock price of the Taiwan stock market exhibits weak form efficiency.

Chiwira and Muyambiri (2012) assessed the nearness of weak form efficiency in the Botswana Stock Exchange (BSE) for the period 2004 - 2008. The examination utilized various tests to look at the randomness of the BSE stock prices. This incorporated the Augmented Dickey Fuller tests, autocorrelation test, Kolmogorov-Smirnov Test, Runs Test and the Phillips Perron unit root test. Every one of the tests show that the BSE is inefficient in weak form proposing the need to improve the efficiency. Moreover, the random walk hypothesis is dismissed suggesting that investment analysts beat the market and they harvest higher than anticipated profits through the use of historic data.

Sing and Sapna (2013) inspected the weak form market efficiency in five stock exchanges of Asian nations. The information utilized comprised of every day, week after week and month to month closing prices. The outcome of the run test show that the Bombay stock exchange (BSE) and Singapore stock exchange (STE) don't pursue random behavior in case of daily prices. In case of monthly prices, BSE has been discovered weak form efficient. Further, the results of autocorrelation and Ljung-Box test uncovered that every stock exchange under investigation pursue random walk behavior in case of monthly and weekly prices except BSE.

Gilani et al. (2014) investigated the weak form efficiency of Islamabad Stock Exchange (ISE) from January 2013 to December 2013. In testing for the weak form efficiency of Islamabad Stock exchange, different statistical techniques were utilized in analyzing the data of weekly ISE-10 share

index. This incorporates the famous tests of statistics such as run test and ADF test to check the Weak form of ISE. The examination additionally centered around the random walk behaviour of stock exchange of Islamabad. Run test and auto correlation test show market inefficiency at specific periods yet ADF test indicated market efficiency in weak form.

Guidi et al. (2011) examined Central and Eastern Europe (CEE) equity markets for the period 1999-2009 by utilizing auto correlation examination, runs test, and variance ratio test for testing random walk hypothesis. It was presumed that the majority of the CEE markets do not pursue random walk and abnormal profit can be gathered by well informed investors.

Dragota and Tilica (2014) inspected any improvement in efficiency dependent on the record. They utilized 20 nations specifically Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, and Ukraine for the period 2008-2010, a time of financial emergencies. Unit root tests, runs test and variance ratio tests were utilized. In some of the markets the theory of EMH was not dismissed.

It is observed that existing literature on efficiency focuses mainly on India and other developed nations with little or no attention to other South Asian countries i.e. Bangladesh, Maldives, Nepal, Pakistan and Sri Lanka. Moreover, results were not consistent in all markets over different period of time as nature of stock market is volatile and the heterogeneity of results was revealed suggesting variable portfolio management techniques for different levels of market efficiency. Enumerating this gap, this paper examines random walk hypothesis in major South Asian Countries by applying more robust methodology.

## Research Methodology

### *Data collection*

This study test weak form efficiency of stock market in major south Asian countries, i.e. Sri Lanka, Bangladesh, Pakistan, India, Nepal and Maldives. One major index of each country is considered to represent their stock market. The data set used in this study is the daily closing prices of indices from 1<sup>st</sup> April 2015 to 31<sup>st</sup> March 2018 which is collected from their respective website. Table 1 depicts the list of indices used for the study.

**Table 1: Indices used in study**

S. No.	Countries	Indices
1.	Bangladesh	DSE Index
2.	India	Nifty 50 Index
3.	Maldives	MASIX Index
4.	Nepal	NEPSE Index
5.	Pakistan	KSE-100 Index
6.	Sri Lanka	Colombo Stock Exchange All Share Index (CSEALL)

### Tools of Analysis

All the results were computed on the basis of R, which is rate of return  $r_t$  in period  $t$ , computed in logarithmic first difference. Descriptive statistic is used to know the nature of data. Both parametric and non parametric tests are applied for testing weak form efficiency of stock market. Parametric tests include ADF unit root test, auto correlation function and Variance ratio test while non parametric tests include PP unit root test, Kolmogorov-Smirnov Goodness of test and run test.

**Augmented Dickey-Fuller (ADF) Test:** It is a parametric test to check the non stationarity. It depends on rationale that a non-stationary procedure has vast memory as it doesn't show rot in a stun that happens all the while. Each random stun diverts the procedure from its prior level not to return back again except if another random stun push it towards its past level. The equation is:

$$\Delta Y_t = \alpha + \beta_t + Y_{t-1} + \Delta Y_{t-1} + \varepsilon_t$$

Where  $\alpha$  is constant,  $\beta_t$  is coefficient on time trend and where  $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$ ,  $\Delta Y_{t-2} = (\Delta Y_{t-2} - \Delta Y_{t-3})$ , etc.

**Phillips-Perron (PP) Unit root test:** It is developed by Phillips and Perron 1988. It is an alternative way of checking the stationarity of stock indices. The PP test overcomes the issue of serial correlations among error terms by introducing a non parametric method. The specification of the PP test is as follows:

$$\Delta Y_t = \beta_{1+} Y_{t-1} + \epsilon_t$$

**Kolmogrov-Smirnov Goodness of test:** The (Chakravart, Laha, and Roy, 1967) is used to decide if a sample comes from a population with a specific distribution. The Kolmogorov-Smirnov (K-S) test is based on the empirical distribution function (ECDF). Given N ordered data points  $Y_1, Y_2, \dots, Y_N$ , the ECDF is defined as

Kolmogorov-Smirnov (K-S) test is based on the empirical distribution function (ECDF). Given N ordered data points  $Y_1, Y_2, \dots, Y_N$ , the ECDF is defined as

$$[E_{-}(N) = n(i)/N]$$

**Autocorrelation Function Test:** Autocorrelation Function (ACF) test is a statistical instrument that can be utilized to distinguish the reliance of progressive terms in a given time. This test is regularly utilized so as to gauge the connection between the stock return at current period and its slacked worth. The particular of the autocorrelation test is as per the following:

$$\rho_k = \frac{\sum_{t=1-k}^m (r_t - \bar{r})(r_{t+k} - \bar{r})}{\sum_{t=1}^m (r_t - \bar{r})^2}$$

Where  $\rho_k$  is the serial correlation coefficient of returns at slack k; m is the no. of observations;  $r_t$  is the stock return at time t; while  $r_{t+k}$  is the stock return over period t-k;  $\bar{r}$  is the sample mean of stock returns; and k is the slack of the period. In the event that the arrangement shows random walk, this implies returns are uncorrelated. In the event that there is no serial correlation among returns, the autocorrelation at all slacks ought to be about zero, and all Q stats ought to be irrelevant with large p values.

The serial correlation test of returns has also been used extensively by Kendell (1953), and Fama (1965), Worthington and Higgs, (2006), Squalli (2006), Singh et al. (2010), Hamid et al. (2010), Mittal and Jain (2009).

**Run test:** It is also called Wald-Wolfowitz test. This test is an appropriate statistical technique to test the weak form market efficiency. A run is defined as a series of consecutive returns of the same sign. “+” stands for a price increase, “-” stands for a price decrease, and “0” stands for no change in price. To test the randomness of distribution, the data whose value is greater than median is marked with + sign, with – sign the data less than the median. Suppose the price changes are independent, the total number of expected runs E(r) can be estimated as for large samples as:

$$E(r) = \frac{2N_1N_2}{N} + 1$$

Where N is total number of observation ( $N_1 + N_2$ )

$N_1$ =the number of price changes (+ sign)

$N_2$ =the number of price changes (- sign)

If the number of observation is large ( $N > 30$ ), E(r) has normal distribution. The variance of E(r) ( $\sigma_r^2$ ) is given by:

$$\sigma_r^2 = \frac{2N_1N_2(2N_1N_2-1)}{(N)^2(N-1)}$$

$$\text{Prob } (E(r) - 1.96\sigma_r \leq R \leq E(r) + 1.96\sigma_r) = 0.95$$

Where R is actual number of runs.

The standard normal Z test statistics used to conduct a run test is given by:

$$Z = \frac{(R \pm 0.5) - E(r)}{\sigma_r}$$

R= Actual number of runs

E(r)= Expected number of runs

$\sigma_r$  = Std. error of expected number of runs

The hypotheses for Runs Tests are:

$$H_0: R = E(r)$$

$$H_1: R \neq E(r)$$

This test is widely used in testing efficiency of stock market. For instance, used by Fama (1965), Sharma and Kennedy (1977), Copper (1982), Chiat and Finn (1983), Wong and Kwong (1984), Yalawar (1988), Ko and Lee (1991), Butler and Malaikah (1992), Abraham (2002), Worthington and Higgs (2006), Squalli (2006), Karemera et al. (1999).

Variance ratio test: Variance ratio test is based on the fact that if a time series follows a RW, in a finite sample the increments in the variance are linear in the observation interval. That is, the variance of difference data should be proportional to the sample interval. Defining  $y_t$  is the first difference of the log of prices and can be modeled as stochastic process having drift as follows:

$$y_t = \mu + y_{t-1} + \epsilon_t$$

Where,  $\mu$  is the drift parameter, expected value of error is zero and  $E(\epsilon_t, \epsilon_{t-1})$ . The restriction on the errors implies that

$$\bar{M}(q) = \frac{\bar{\sigma}^2(q)}{\bar{\sigma}^2(1)}$$

$$\text{Where } \bar{\sigma}^2(q) = \frac{1}{q(nq-q+1)(1-\frac{1}{n})} \sum_{i=q}^{nq} [y_i - y_{i-q} - q\hat{u}]^2$$

$$\bar{\sigma}^2(1) = \frac{1}{(nq-1)} \sum_{i=1}^{nq} [y_i - y_{i-1} - \hat{u}]^2$$

$$\hat{u} = \frac{1}{nq} \sum_{i=1}^{nq} (y_i - y_{i-1})$$

The  $Z^*$  test statistics derived by Lo and MacKinlay is as follows

$$z^*(q) = M_p(\bar{q})[V(q)]^{-1/2} \approx N(0,1)$$

$$V(q) = \sum_{j=1}^{q-1} \left[ \frac{2(q-j)}{q} \right]^{2\bar{\delta}(j)}$$

$$\bar{\delta}(j) = \left\{ (nq) \sum_{i=j+1}^{nq} (y_i - y_{i-1} - \hat{\mu})^2 (y_{i-j} - y_{i-j-1} - \hat{\mu})^2 \right\} X \left\{ \sum_{i=1}^{nq} ((y_i - y_{i-1} - \hat{\mu})^2)_2 \right\}^{-1}$$

The random walk hypothesis requires that the variance ratio for all the chosen aggregation intervals,  $q$ , be equal to one.

### Analysis and findings

Table 2 represents the outcome of descriptive statistic of daily returns for all the indices. Mean returns of all the indices are positive except CSE All Share index which reports negative mean returns. It is observed that the

the variance of the error will grow linearly with the time step. Following Lo and MacKinlay (1988) and Chow and Denning (1993), the variance of  $(y_t - y_{t-1})$  is  $1/n$  times the variance of  $(y_t - y_{t-n})$ . In another words,

$\frac{(\frac{1}{N})VAR(y_{t+n} - y_t)}{VAR(y_{t+1} - y_t)} = 1$  will hold asymptotically even with possible heteroscedastic increments. Furthermore, given a finite number of price movements represented by  $nq+1$  consecutive  $y_t$ s, the Lo-MacKinlay variance ratio estimate is calculated as

$$\bar{M}(q) = \frac{\bar{\sigma}^2(q)}{\bar{\sigma}^2(1)}$$

$$\text{Where } \bar{\sigma}^2(q) = \frac{1}{q(nq-q+1)(1-\frac{1}{n})} \sum_{i=q}^{nq} [y_i - y_{i-q} - q\hat{u}]^2$$

$$\bar{\sigma}^2(1) = \frac{1}{(nq-1)} \sum_{i=1}^{nq} [y_i - y_{i-1} - \hat{u}]^2$$

$$\hat{u} = \frac{1}{nq} \sum_{i=1}^{nq} (y_i - y_{i-1})$$

distributions of all series are positively or negatively skewed representing the asymmetrical distribution. The output of kurtosis suggests that daily return series have flatter tails than the normal distribution which shows leptokurtic nature of time series. Non normal distribution of returns is confirmed by Jarque Bera test which dismiss null hypothesis of normal distribution at 1% level of significance.

**Table 2: Descriptive statistic**

Sl. No.	Indices	Mean	Median	Standard Deviation	Skewness	Kurtosis	Jarque Bera Test
1.	DSE Index	0.000319	0.00035	0.006474	0.283384	5.87253	268.967
							(0.0000)
2.	Nifty 50 Index	0.000294	0.0004	0.008496	-0.68838	7.196626	618.5393
							(0.0000)
3.	MASIX Index	2.73X10 <sup>-5</sup>	7.92 X10 <sup>-5</sup>	0.005519	-0.21838	5.546227	204.9485
							(0.0000)
4.	NEPSE Index	0.000384	0.00042	0.012254	0.241604	6.005821	262.6061
							(0.0000)
5.	KSE-100 Index	0.000517	0.00045	0.009288	-0.56753	6.109926	350.2626
							(0.0000)
6.	CSE All Share Index	-9.10 X10 <sup>-5</sup>	-0.00032	0.004395	-0.05162	5.796169	235.2028
							(0.0000)

*p*-values are presented in parentheses

One of the necessities for random walk is that arrangement must contain unit root. Two unit root tests i.e., ADF and PP test are applied at both level and first difference. The output of unit root tests is available in table 3 (an) and 3(b). The Null hypothesis of a unit root in level series can't be

dismissed in all series. This indicates non stationary nature of time series. However, null hypothesis of unit root is rejected for all series at first difference. Therefore, all series are integrated of order one i.e. I(1) and efficient in weak form.

**Table 3 (a): Unit root test at level**

S. No.	Indices		ADF test			PP test		
			Intercept	Trend & Intercept	None	Intercept	Trend & Intercept	None
1.	DSE Index	t-statistic	-0.93519 (0.777)	-1.73338 (0.7356)	0.9478 (0.9091)	-0.86088 (0.8004)	-1.80617 (0.7011)	0.945867 (0.9088)
		DW	1.985965	1.986325	1.985094	1.501299	1.498322	1.50215
2.	Nifty 50 Index	t-statistic	-0.11545 (0.9458)	-2.50604 (0.3251)	1.064183 (0.9253)	-0.124583 (0.9448)	-2.513745 (0.3213)	1.062440 (0.9252)
		DW	1.860927	1.858639	1.861933	1.860927	1.858639	1.861933
3.	MASIX Index	t-statistic	-1.55502 (0.5052)	-2.60681 (0.2774)	0.084148 (0.7092)	-1.6783 (0.4419)	-2.64965 (0.2583)	0.07438 (0.7061)
		DW	1.89575	1.902626	1.904171	1.89575	1.902626	1.904171
4.	NEPSE Index	t-statistic	-1.80709 (0.3772)	-0.78397 (0.9654)	0.164067 (0.7335)	-1.77192 (0.3946)	-0.59901 (0.9784)	0.183598 (0.7393)
		DW	1.960107	1.958186	1.959456	1.496571	1.510118	1.496436
5.	KSE-100 Index	t-statistic	-1.36654 (0.5997)	-1.543 (0.814)	0.922353 (0.9053)	-1.40055 (0.5831)	-1.42478 (0.8532)	1.046334 (0.923)
		DW	1.99527	1.995855	1.99528	1.668888	1.667105	1.669622
6.	CSE All Share Index	t-statistic	-1.55812 (0.5036)	-1.57713 (0.8013)	-0.56854 (0.4709)	-1.7911 (0.3851)	-1.97714 (0.6123)	-0.46849 (0.5125)
		DW	2.014591	2.014862	2.012857	1.561279	1.56041	1.563879

*p*-values are presented in parentheses

**Table 3 (b): Unit root test at first Difference**

S. No.	Indices		ADF test			PP test		
			Intercept	Trend & Intercept	None	Intercept	Trend & Intercept	None
1.	DSE Index	t-statistic	-21.2488 (0.0000)	-21.2338 (0.0000)	-21.2192 (0.0000)	-21.4095 (0.0000)	-21.3944 (0.0000)	-21.4023 (0.0000)
			1.9851	1.985176	1.985945	1.9851	1.985176	1.985945
2.	Nifty 50 Index	t-statistic	-25.7184 (0.0000)	-25.7711 (0.0000)	-25.7007 (0.0000)	-209.3364 (0.0000)	-208.9593 (0.0000)	-209.4855 (0.0000)
			1.997967	1.998074	1.998152	0.0001	0.0001	0.0001
3.	MASIX Index	t-statistic	-25.8358 (0.0000)	-25.9301 (0.0000)	-25.8529 (0.0000)	-25.8227 (0.0000)	-25.9045 (0.0000)	-25.84 (0.0000)
			2.002825	2.002626	2.002826	2.002825	2.002626	2.002826
4.	NEPSE Index	t-statistic	-20.1146 (0.0000)	-20.2526 (0.0000)	-20.1201 (0.0000)	-19.986 (0.0000)	-20.0511 (0.0000)	-19.9961 (0.0000)
			1.959424	1.957134	1.959487	1.959424	1.957134	1.959487
5.	KSE-100 Index	t-statistic	-23.4575 (0.0000)	-23.4497 (0.0000)	-23.4255 (0.0000)	-23.321 (0.0000)	-23.3114 (0.0000)	-23.2957 (0.0000)
			1.995158	1.99498	1.995834	1.995158	1.99438	1.995834
6.	CSE All Share Index	t-statistic	-21.4979 (0.0000)	-21.4905 (0.0000)	-21.5038 (0.0000)	-22.7481 (0.0000)	-22.7344 (0.0000)	-22.761 (0.0000)
			2.012855	2.012958	2.013041	2.012855	2.012958	2.013041

p-values are presented in parentheses

This test looks at the cumulative distributional function for variable with normal distribution and decides if the returns have originated from the predefined distribution. Table 4 shows the outcome of one sample K-S test. The null hypothesis of normal distribution is dismissed for all the

indices at 5% significance level as p estimation of all indices are less than 0.05. Subsequently, the returns are not seen as normally distributed. This implies that stock market of all South Asian countries is inefficient in weak form as it doesn't meet basic requirement of random walk hypothesis.

**Table 4: Kolmogorov-Smirnov test**

Test Statistic	DSE Index	Nifty 50 Index	MASIX Index	SE Index	KSE-100 Index	Colombo Stock Exchange All Share Index (CSEALL)
Absolute	.057	.068	.063	.083	.058	.063
Positive	.055	.044	.056	.083	.046	.063
Negative	-.057	-.068	-.063	-.078	-.058	-.055
Kolmogorov-Smirnov Z	1.558	1.877	1.711	2.164	1.607	1.704
Asymp. Sig. (2-tailed)	.016	.002	.006	.000	.011	.006

ACF test is utilized so as to analyze the level of autocorrelation in return series. If there is no serial correlation among returns, the autocorrelation at all lags ought to be about zero, and all Q statistics ought to be insignificant with huge p-value. As per the outcomes

announced in Table 5, null hypothesis of no autocorrelation is dismissed at 1% level of significance. Consequently, the result of autocorrelation demonstrates that indices are not weak form efficient

**Table 5: ACF test**

S. No.	Indices	Lags			
		1	4	8	12
1.	DSE Index				
	ACF	0.249	0.017	-0.088	0.018
	Q statistic	46.7	54.688	64.591	66.898
	p-value	0.0000	0.0000	0.0000	0.0000
2.	Nifty 50 Index				
	ACF	-0.459	-0.043	-0.077	0.011
	Q statistic	160.4	171.98	187.19	189.11
	p-value	0.0000	0.0000	0.0000	0.0000
3.	MASIX Index				
	ACF	0.047	-0.028	0.065	0.027
	Q statistic	1.6094	3.2162	11.064	12.971
	p-value	0.205	0.522	0.198	0.371
4.	NEPSE Index				
	ACF	0.264	-0.008	-0.005	0.021
	Q statistic	47.435	47.487	50.844	59.445
	p-value	0.0000	0.0000	0.0000	0.0000
5.	KSE-100 Index				
	ACF	-0.417	0.044	-0.041	-0.014
	Q statistic	133.59	138.92	149.66	151
	p-value	0.0000	0.0000	0.0000	0.0000
6.	Colombo Stock Exchange All Share Index (CSEALL)				
	ACF	0.219	0.125	0.053	0.07
	Q statistic	34.824	62.679	77.835	87.358
	p-value	0.0000	0.0000	0.0000	0.0000

The run test is method for researching the serial dependence in share return movements. This test has the upside of disregarding the circulation of information and doesn't require ordinarity and consistent difference of the information. This test was applied by utilizing both mean and median. The result of table 6 reveals that expected

number of runs is less than the actual runs for all the indices except Nifty 50 and MASIX indices. This confirms the non-random behavior of stock market of all South Asian countries except India and Maldives. This shows that market of Bangladesh, Nepal, Pakistan and Sri Lanka is inefficient in weak form.

**Table 6: Run test**

	DSE Index		Nifty 50 Index		MASIX Index		NEPSE Index		KSE-100 Index		Colombo Stock Exchange All Share Index (CSEALL)	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Test value	.00035	.0003	.000400	.0003	.000079	.0003	.000000	.0004	.00045	.0005	-.00032	-.00009
Cases <test value	375	373	380	375	368	363	339	356	383	387	360	377
Cases ≥ test value	378	380	381	386	369	374	341	324	384	380	361	344
Total cases	753	753	761	761	737	737	680	680	767	767	721	721
No. of runs	303	305	375	377	359	357	251	248	306	308	317	319
Z Statistic	-5.433	-5.286	-4.72	-3.21	-.774	-.916	-6.908	-7.096	-5.673	-5.526	-3.317	-3.118
Asymp. Significance (two tailed)	.000	.000	0.637	.748	.439	.360	.000	.000	.000	.001	.002	

Variance ratio test is applied by assuming both heteroskedasticity and homoskedasticity. Two outcomes are given in the variance ratio test, the joint tests and individual tests. Results of VR test are accounted for in table 7(a) and 7(b). The joint tests give the tests of the joint null hypothesis for all test periods; while the individual tests apply to the

individual test periods have been indicated. Daily data has a test period that has a minimum of 2 and a maximum of 16 periods. In case of heteroskedasticity, both individual and joint test dismisses the invalid theory of martingale for all the indices which suggests that returns don't pursue random walk.

**Table 7(a): Variance ratio test assuming heteroskedasticity**

S. No.	Indices		Period 2	Period 4	Period 8	Period 16
1.	DSE Index	Z statistic	-7.10597	-7.14323**	-5.5256	-4.26199
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.633898	0.32818	0.182619	0.083265
2.	Nifty 50 Index	Z statistic	-7.60267**	-6.87495	-5.74097	-4.452
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.542478	0.28283	0.13929	0.070824
3.	MASIX Index	Z statistic	-8.36435**	-7.03504	-5.72928	-4.21491
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.506331	0.271238	0.124285	0.071234
4.	NEPSE Index	Z statistic	-4.94984	-5.64786**	-4.99627	-4.17338
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.676252	0.340429	0.170613	0.085384
5.	KSE-100 Index	Z statistic	-6.60518	-6.64631**	-5.48521	-4.08418
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.584194	0.296535	0.150902	0.086149
6.	Colombo Stock Exchange All Share Index (CSEALL)	Z statistic	-7.24976**	-6.83821	-5.51553	-4.399
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.583219	0.282442	0.1527	0.076689

Maximum Z values of joint test are shown with asterisks

In case of homoskedasticity also, null hypothesis of random walk is rejected by individual and joint test. This shows that all the South Asian stock market is inefficient in weak form.

Therefore investors can make abnormal profit by predicting future stock prices.

**Table 7(b): Variance ratio test assuming homoskedasticity**

S.No.	Indices		Period 2	Period 4	Period 8	Period 16	Wald statistic
1.	DSE Index	Z statistic	-7.89963**	-6.50121	-4.72637	-3.39034	62.55634
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.497358	0.226109	0.110423	0.050454	-
2.	Nifty 50 Index	Z statistic	-7.02293**	-5.68864	-4.17084	-2.70664	49.73044
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0068)	(0.0000)
		Variance ratio	0.52215	0.275872	0.160538	0.189366	-
3.	MASIX Index	Z statistic	-7.74614**	-5.06328	-4.01893	-2.88087	65.84637
		Probability	(0.0000)	(0.0000)	(0.0001)	(0.0040)	(0.0000)
		Variance ratio	0.446704	0.323391	0.150847	0.094232	-
4.	NEPSE Index	Z statistic	-6.48673**	-5.39668	-4.22051	-3.03405	42.36914
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0024)	(0.0000)
		Variance ratio	0.549141	0.298261	0.132272	0.07176	-
5.	KSE-100 Index	Z statistic	-11.5504**	-10.4413	-7.97023	-5.76707	137.3877
		Probability	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		Variance ratio	0.582669	0.294215	0.148155	0.082806	-
6.	Colombo Stock Exchange All Share Index (CSEALL)	Z statistic	-4.80526**	-4.57625	-3.30573	-2.03223	25.32238
		Probability	(0.0000)	(0.0000)	(0.0009)	(0.0421)	(0.0000)
		Variance ratio	0.623623	0.329422	0.234091	0.299352	-

Maximum Z values of joint test are shown with asterisks

## Conclusion

The paper examines the weak form efficiency of stock market in the South Asian market using daily closing prices from 1<sup>st</sup> April 2015 to 31<sup>st</sup> March 2018. Both parametric and non parametric tests are applied. It is found through descriptive statistics that return series for all the four indices are not normally distributed. Both ADF and PP test shows that all series are integrated of order one i.e. I(1). This implies that return series is non-stationary i.e. unit root is present and market is efficient in weak form. More robust tests were applied to affirm the results of ADF and PP test. Weak form of inefficiency in all South Asian countries is confirmed by ACF, KS one sample and variance ratio test. However, Run test reveals weak form efficiency in stock

markets of India and Maldives. This shows that all past information is fully incorporated in stock price changes of India and Maldives. Thus we can conclude that stock markets of Bangladesh, Nepal, Pakistan and Sri Lanka was informationally inefficient. These results support the common notion that the equity markets in the emerging economies are not efficient and to some degree can also explain the less optimal allocation of portfolios into these markets. This implies that investors can make abnormal profit in stock markets of Bangladesh, Nepal, Pakistan and Sri Lanka by processing privileged information. On the other hand the investors may be unwilling to trade in these stock market if it is felt that the information is possessed by others.

## References:

- Abraham, A., et al. 2002. "Testing the random walk behavior and efficiency of the Gulf Stock Markets." *The Financial Review*, 37(3):469-480.
- Ahmad, K. M., et al., 2006. "Testing weak form of efficiency for Indian stock markets." *Economic and Political Weekly* 41(1):49-56.
- Alam, M. I., et al. 1999. "An Application of Variance - Ratio Test to Five Asian Stock Markets." *Review of Pacific Basin Financial Markets and Policies*, 2(3): 301-315.
- Ali, S., et al. 2018. "Stock market efficiency: A comparative analysis of Islamic and conventional stock markets." *Physica A: Statistical Mechanics and its Applications*, 503©: 139-153.
- Antoniou, A., et al. 1997. "Technical Analysis, Trading Volume and Market Efficiency: Evidence from an Emerging Market." *Applied Financial Economics*, 7(1): 361-365.
- Awad, I., and Daraghma, Z., 2009. "Testing the Weak-Form Efficiency of the Palestinian Securities Market." *International Research Journal of Finance and Economics*, 32: 7-17.
- Barnes, P., 1986. "Thin Trading and stock market efficiency: A case of the Kuala Lumpur Stock Exchange." *Journal of Business Finance and Accounting*, 13(4): 609-617.
- Barua, S. K., and Raghunathan, V., 1987. "Efficiency and Speculation in the Indian Capital Market." *Vikalpa*, 12(3): 53-589.
- Barua, S. K., 1981. "Short-run Price Behaviour of Securities: Some Evidence from Indian Capital Market." *Vikalpa*, 6(2): 93-100.
- Butler, K.C., and Malaikah, S. J. (1992)., "Efficiency and Inefficiency in thinly traded stock markets: Kuwait and Saudi Arabia", *Journal of Banking and Finance*, Vol. 16, pp.197-210.
- Caner, M., and Hasen, B., 2001. "Threshold auto regression with a unit root." *Econometrica*, 49: 1057-1072.
- Chakravarti, I.M., et al. 1967. *Handbook of Methods of Applied Statistics*, I, John Wiley and Sons, Hoboken, 1967, 392-394.
- Chander, R., et al. 2008. "Empirical Evidences on Weak Form Stock Market Efficiency: The Indian Experience." *Decision*, 35(1): 75-109.
- Chang, K - P and Ting, K - S, 2000: "A variance Ratio Test of the Random Walk Hypothesis for Taiwan's Stock Market." *Applied Financial Economics*, 10: 525-532.
- Cheung, K - C., and Coutts, J. A., 2001. "A Note on Weak Form Market Efficiency in Security Prices: Evidence from the Hong Kong Stock Exchange." *Applied Economics Letters*, 8: 407-410.
- Chiat, H. S. and Finn, F. J., 1983. "Random walk on the stock exchange of Singapore", *Accounting and Finance*, 23: 81-87.
- Chigozie, O. G., 2010. "Analysis of Weak-Form Efficiency on the Nigerian Stock Market: Further Evidence from GARCH Model." *The International Journal of Applied Economics and Finance*, 4(2): 62-66.
- Chiwira, O. and Muyambiri, B., 2012. "A Test of Weak Form Efficiency for the Botswana Stock Exchange (2004-2008)." *British Journal of Economics, Management and Trade*, 2(2):83-91
- Choudhury, S. K., 1991. "Short run share price behaviour: New evidence on weak form of market efficiency." *Vikalpa*, 16(4):17-21.
- Cooper, J., 1982. "World stock markets: some random walk tests." *Applied Economics*, 14:515-531.
- Cooray, A. and Wickremasinghe, G., 2005. "The Efficiency of Emerging Stock Markets: Empirical Evidence from the South Asian Region." *Journal of developing areas*, 1(41): 171-184.
- Cootner, P., 1962. "Stock Prices: Random vs. Systematic Changes." *Industrial Management Review*, 3: 24-45.
- Dhankar, R. S. , 1991. "Empirical Tests of the Efficiency of Indian Stock Market." *Journal of financial Management and Analysis*, 4(2): 37-43.
- Dickey, D. A. and Fuller, W. A., 1981. "Likelihood Ratio Statistics for Autoregresssive Time Series with a Unit Root." *Econometrica*, 49: 1057-1072.
- Dickey, D. A. and Fuller. W. A., 1979. "Distribution of the Estimator for Autoregressive Time Series with a Unit Root." *J. Amer. Statist. Assoc.* 74: 427-431.
- Dickinson and Muragu, 1994. "Market Efficiency in Developing Countries: A case study of the Nairobi Stock Exchange." *Journal of Business Finance and Accounting*, 21(1): 133-150.

- Dragota, V., and Tilica, E. V., 2014. "Market efficiency of the Post Communist East European stock markets." *European Journal of Operations Research*, 22(2):307-337.
- El-Erian, Mohamed, and Manmohan, S. Kumar , 1995. "Emerging Equity Markets in the Middle Eastern Countries." IMF staff papers, IMF, 42(2): 313-343.
- Evans, T., 2006. "Efficiency tests of the UK financial futures markets and the impact of electronic trading systems." *Applied financial Economics*, 16(17): 1273-1283.
- Faada, S., 2019. "Testing the random walk hypothesis of stock indexes through variance ratio." *Periodicals of Engineering and Natural Science*, 7(1): 12-19
- Fama, E., 1970. "Efficient Capital Markets: A Review of Theory and Empirical Work". *Journal of Finance*, 25: 383–417.
- Fawson, C., et al.1996. "The weak-Form Efficiency of the Taiwan Share market." *Applied Economics Letters*, 3: 663-667.
- Gilani, S.T., et al.2014. "Testing the Weak Form Efficiency of Islamabad Stock Exchange (ISE)." *Developing countries studies*, 4(11): 79-86.
- Groenewold, N., et al.2003. "The Efficiency of the Chinese Stock Market and the Role of the Banks." *Journal of Asian Economies*, 14: 593-609.
- Guidi, F., et al. 2014. "Weak-form market efficiency and calendar anomalies for Eastern Europe equity markets. *Journal of Emerging Market Finance*, 10(3): 337-389.
- Gupta, O. P., 1985." Behavior of Share Prices in India: A Test of Market Efficiency." New Delhi, ND, National Publishing House.
- Gupta, O. P., 2001. "A Study of Stock Market Efficiency in India." *Finance India*, 15(2): 665-673.
- Gupta, R. and Basu, P.K., 2007. "Weak form efficiency in Indian Stock markets." IBER Journal, 6(3): 57-64.
- Habibah, U., et al. 2017. "Testing the Random Walk Hypothesis: A Case of Pakistan." *International Journal of Academic Research in Business and Social Sciences*, 7(7): 551-564.
- Hamid, K., et al. (2010). "Testing the Weak form of Efficient Market Hypothesis: Empirical Evidence from Asia-Pacific Markets." *International Research Journal of Finance and Economics*, 58: 121-133.
- Hasanov, M. (2009). "A note on efficiency of Australian and New Zealand stock markets." *Applied Economics*, 41: 269-273.
- Hudson, R., et al. 1994). "A note on the weak form efficiency of capital markets: The application of simple technical trading rules to UK Stock prices-1935 to 1994." *Journal of Banking and Finance*, 20: 1121-1132.
- Jaffe, J. and Westerfield, R. (1985). "The Week-end Effect in Common Stock Returns: The International Evidence." *Journal of Finance*, 40(2): 432-454.
- Kapetanios, G., et al.. (2003). "Testing for a unit root in the nonlinear STAR framework." *Journal of Econometrics*, 112: 359-379.
- Karemra, David, et al. (1999). "Random Walks and Market Efficiency Tests: Evidence from Emerging Equity Markets." *Review of Quantitative Finance and Accounting*, 113 (2): 171-188.
- Kendall, M. G. (1953). "The analysis of Economic Time-Series-Part1: Prices." *The journal of the Royal statistical Society*, 116(1): 11-25.
- Kleiman, R. T., et al. 2002). "Random Walk and Market Efficiency: Evidence from International Real Estate Market." *Journal of Real Estate Research*, 24(3): 279-297.
- Ko, K. S. and Lee, S. B. (1991). "A comparative analysis of the Daily behaviour of stock returns: Japan, The US and the Asian NICs." *Journal of Business Finance and Accounting*, 18(2): 219-234.
- Kulkarni, N. Suresh (1978). "Share Price Behavior in India: A Spectral Analysis of Random Walk Hypothesis." *Sankhya, The Indian Journal of Statistics*, 40: 135-162.
- Lazar, D. and Nouroul, A. B. (2009). "Testing of Weak-Form Efficiency in Indian Capital market." *Advances in Management*, 2(10): 15-20.
- Lima, E. J. A. and Tabak, B. M. (2004). "Tests of the Random Walk Hypothesis for Equity Markets: Evidence from China, Hong Kong and Singapore." *Applied Economics Letters*, 11: 255-258.
- Lo, A. W. and Mackinlay, C. (1988). "Stock market prices do not follow random walks: Evidence from a simple specification test." *Review of Financial Studies*, 1: 41-66.
- Mishra, A. K. and Thomas, P. (2005)." Integration and efficiency of stock and foreign exchange market in India." Retrieved from SSRN website:

- [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=201088255](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=201088255) (accessed on 10th January, 2010).
- Mishra, B., 2000. "Is There any Monthly Seasonal Pattern in Indian Stock Market?" In Shashikant, U. and Arumugam, S. (eds.), Indian Capital Market: Trends and Dimensions. New Delhi, ND: Tata McGraw Hill :372-393.
- Mishra, P. K., and Pradhan, B. B, 2009. "Capital Market efficiency and Financial Innovation - A Perspective Analysis." *The Research Network*, 4(1): 1-5.
- Mishra, P. K., 2009. "Indian Capital Market - Revisiting Market Efficiency." *Indian Journal of Capital Markets*, 2(5):30-34.
- Mittal, R. K., 1995. "Weak Form Market Efficiency: Empirical Tests on the Indian Stock Market." *Pranjan*, 23(3): 297-313.
- Mittal, S. K. and Jain, S., 2009. "Stock Market Behaviour: Evidences from Indian Market." *Vision*, 13(3): 19-29.
- Moustafa, M. A., 2004. "Testing the weak form efficiency of the United Arab Emirates Stock Market." *International Journal of Business*, 9: 309-325.
- Narayan, P. K., 2005. "Are the Australian and New Zealand stock prices nonlinear with unit root?" *Applied Economics*, 37:2161-2166.
- Omran, M., and Farrar, S., 2006. "Test of Weak form efficiency in the Middle East Emerging markets." *Studies in Economics and Finance*, 23: 13-26.
- Oskooe, S.A., et al. 2010. "The Random Walk Hypothesis in Emerging Stock Market." *International Research Journal of Finance and Economics*, 50: 51-61.
- Panas, E., 1990. "The Behavior of the Athens stock prices." *Applied Economics*, 22: 1715-1727.
- Pandey, A., 2003. "Efficiency of Indian Stock Market." Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=474921](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=474921).
- Pant, B. and Bishnoi, T. R., 2001. "Testing random walk hypothesis for Indian stock market indices." Paper Presented at UTI Capital Market Conference. Retrieved from [http://www.uticm.com/cmc/PDFs/2002/bhanu\\_pant.pdf](http://www.uticm.com/cmc/PDFs/2002/bhanu_pant.pdf) (accessed on 18th August, 2010).
- Parulekar, P.D., 2017. "Evaluation of Weak form of Market Efficiency Theory for Selected five Companies from Nifty." *IOSR Journal of Economics and Finance* (IOSRJEF), 1:75-83
- Phillips, P.C.B. and Perron, P., 1988. "Testing for Unit Roots in Time Series Regression." *Biometrika*, 75: 335-346.
- Poshakwale, S., 1996. "Evidence on weak form efficiency and Day of the week effect in the Indian stock market." *Finance India*, 10(3): 605-616.
- Prusty, S., 2007. "Market Efficiency and Financial Markets Integration in India." *Indian Journal of economics and Business*, 3: 23-42.
- Ramchandran, J., 1985. "Behaviour of Stock Market Prices: Information Assimilation and Market Efficiency." Unpublished Dissertation, Indian Institute of Management, Ahmadabad.
- Rao, N. K. and Mukherjee, B., 1971. "Random Walk Hypothesis: An Empirical Study." *Arthaniti*, 14, (1-2): 53-59.
- Seddighi, H. R. and Nian W., 2004. "The Chinese Stock Exchange Market: Operations and Efficiency." *Applied Financial Economics*, 14: 785-797.
- Sharma, J. and Kennedy, R. E., 1977. "A comparative analysis of stock price behaviour on the Bombay, London and New York stock exchanges." *Journal of Financial and Quantitative Analysis*, September: 391-413.
- Sharma, J. and Kennedy, Robert. E., 1977. "A Comparative analysis of stock price behavior on the Bombay, London and New York Stock Exchanges." *Journal of Financial and Quantitative Analysis*, 12(3): 391-413.
- Sharpe, W. , 1966. "Mutual Fund Performance." *Journal of Business*, 39: 119-138.
- Sing, S. and Sapna, K., 2013. "Weak Form Efficiency of Selected Asian Stock Exchange." *International Journal of 360° Management Review*, 1: 1-17.
- Singh, Y. P., et al. . "Testing Weak Form Efficiency for Indian Stock Market." *Finance India*, 24(3): 793-812.
- Smith, G., et al. 2002. "African stock markets: multiple variance ratio tests of random walks." *Applied Financial Economics*, 12: 475-484.

- Squalli, J., 2006. "A non-parametric assessment of weak form efficiency in the UAE financial markets." *Applied Financial Economics*, 16: 1365-1373.
- Srinivasan, N. P., and Narasimhan, M. S., 1988." Testing Stock market Efficiency Using Risk - Return Parity Rule." *Vikalpa*, 13(2): 61-66.
- Srinivasan, P., 2010. "Does Indian Equity Market Follow Random Walks? Evidence from the National Stock Exchange," *International Journal of Research in Commerce and Management*, 1(8): 88-94.
- Steeley, J. M., 2001. "A Note on Information Seasonality and the Disappearance of the Weekend Effect in the UK Stock Market." *Journal of Banking and Finance*, 25(10): 1941-1956.
- Stickel, S. E., 1995. "The Anatomy of the Performance of Buy and Sell Recommendations." *Financial Analysts Journal*, 51(5): 25-39.
- Sung, M. and Johnson, J. , 2006. "A new perspective on weak form efficiency: empirical evidence from the UK bookmaker based betting market." Paper Presented at 13<sup>th</sup> International Conference on Gambling and Risk Taking, Neveda, USA. Retrieved from <http://eprints.soton.ac.uk/51347/> (accessed on 13th July, 2010).
- Vaidyanathan, R., and Gali, K. K., 1994. "Efficiency of the Indian Capital Market." *Indian Journal of Finance and Research*, 5(2):36-48.
- Verma, A. and Rao, N., 2007. "An Examination of Weak Form Efficiency of BSE 100 Index Companies." *The ICFAI Journal of Financial Economics*, 5(4): 81-93.
- Williamson J., 1972. "Measuring mutual fund performance." *Financial Analysts Journal*, November/December: 78-84.
- Womack, K., 1996. "Do Brokerage Analyst's Recommendations Have Investment Value?" *Journal of Finance*, 51(1): 137-167.
- Wong, K. and Kwong, K., 1984. "The behaviour of Hong Kong stock prices." *Applied Economics*, 16: 905-917.
- Working, H., 1960. "Note on the Correlation of First Differences of Averages in a Random Chain." *Econometrica*, 28: 916-918.
- Worthington, A. C. and Higgs, H., 2009. "Efficiency in the Australian stock market, 1875- 2006: a note on extreme long-run random walk behaviour." *Applied Economics* letter, 16:301-306.
- Worthington, A. C., and Higgs, H., 2006. "Evaluating financial development in emerging capital markets with efficiency benchmark." *Journal of Economic Development*, 37(1):17-44.
- Yalawar Y., 1988. "Bombay stock exchange: rates of return and efficiency." *Indian Economic Journal*, 35: 68–121

\*\*\*\*\*

# Service Quality: Business Incubation and Supportive Policy Intervention



**Dr. Nazia Sultana**  
 Assistant Professor,  
 Department of Commerce,  
 University College for Women,  
 Osmania University, Hyderabad.  
 Email: 01.nazia@gmail.com



**Dr. Nidhi Gupta**  
 Consultant  
 Avdesh Sewa Samiti  
 Uttar Pradesh, India.  
 Email:dr.nidhigupta09@gmail.com

## A b s t r a c t

The paper presents a conceptual model to assess the service quality of business incubators, identifies the service quality dimensions and suggests to match the tenant/start-up firm's perception with incubator's service design, delivery and differentiation gave a supportive policy funding by the government. This study has managerial implications facilitating the incubators to adjust their value proposition to incorporate changing paradigms of the entrepreneurial ecosystem. It will be of interest to the tenant firms in assessing the service quality of incubator before they affiliate to them. It will help policy makers identify incubators appropriate for funding.

**Keywords:** *Incubation, Entrepreneurship, Service Quality, Tenant Selection, Policy Intervention.*

**Abbreviations:** AIM- Atal Incubation Mission; ATL- Atal Tinkering Labs, SERQUAL- Service Quality, BIIA- Business Innovation and Incubation Australia, NSQF- National Skill Qualification Framework, STP- Science and Technology Park

**U**nderstanding a business incubation model requires a conceptual understanding of the process, players and the outcomes. There exists the incredible opportunity in exploring the new vistas on business incubation. Authors believe that a novel outlook at the incubation process is the need of the hour and hence propose a model establishing linkages between the incubators, government and the incubated firms.

In the last decade, India witnessed robust growth of new business ventures, newer business models and lately an improved rank for ease of doing business assigned by the World Bank. Business incubators stimulate new business creation and Government of India routes financial assistance to the start-ups through these incubators who select innovative entrepreneurial ideas for channeling government funds. Literature analysis suggest that incubation models such as Campbell (1985), Smilor (1987), Infodev (1989), Hackett & Dilts (2004) have evolved but none considered the supportive intervention of government in fostering entrepreneurship through business incubation. Previous works are silent about service quality of incubators which impact the performance of incubatee firms. This study will have implications helping incubators adjust their value proposition to incorporate changing paradigms of entrepreneurial ecosystem. It will be of interest to tenant firms in assessing the service quality of incubator before they affiliate to them. Government policy decisions of funding, monitoring and assessment of incubators can well be implemented by applying the model proposed in the study.

Business incubation is a business support process that accelerates the successful development of start-up and fledgling companies. Incubators provide entrepreneurs with an array of targeted resources and services and are responsible for providing support across a startup's life cycle and help founders move from the concept to prototype stage. The Government of India recognised the need of the hour and launched several schemes fostering entrepreneurial climate amongst which 'Start-up India, Stand-up India' has seen fruitful results. At national level, the Start-up India Scheme was launched in 2016 which promoted industry-academia linkages through 70 new incubators, startup centers, and research parks. Another notable policy support is the Atal Innovation Mission (AIM, launched in 2015) that concentrated on creating 100 new sector- or technology-

specific incubators and extending support for existing incubators. At the State level, 15 state governments introduced specifically designed startup policies between 2014 and 2016 and Telangana government initiated T-hub and hosted the Global Entrepreneurship Summit.

### Literature Review

Campbell et al. (1985) created the first business incubation process model that supports the transformation of ideas and proposals into a viable company through various activities in the business incubator. The model showed four key value adding activities, namely diagnosis of business needs, selection and monitoring of firms, investment of capital and access to network of incubator. These value-creating activities contribute to the performance of participating companies (Campbell, et al., 1985). Business incubation is a system which is constructed from different building blocks (*support systems*) and it seeks to identify the different components of the new business incubation process (Smilor, 1987).

Smilor's model on business incubation is an improvement over Campbell's model (1985). Incubators provide entrepreneurs with an array of targeted resources and services and are responsible for providing support across a startup's life cycle and help founders move from the concept to prototype stage. Smilor's model is a structural one and mainly focusses on support system (secretarial, expert advice, administration etc.) and incubator affiliation. The model has strong emphasis on the external perspective (in terms of outcomes such as economic development, job creation, technology diversification) but neglects the internal one (entrepreneur's process and incubation process). There is a need in incubator if there is a demand coming from entrepreneurial community (Nijkamp, 1988). Nijkamp and Smilor extended the Smilor's model and interpreted an incubator as a mediator between entrepreneurs and community. Presence of local entrepreneurial culture is the most important and most under-estimated factor in the process of business incubation. A step-by-step model of business incubation was given by Cater and Jones in the year 2000. It is one of the first process models on business incubation and gives useful insights on steps of incubation process; they divided the stages into idea formulation, post entry development, opportunity recognition, entry and launch and pre-start planning and

preparation. Carter and Jones (2000) understanding of the business incubation is the first conceptualisation of the incubation flow.

Traditional business development entrepreneurs face a common challenge: the absence of capital, human resources, and management capabilities (Nowak and Grantham, 2000). A virtual incubator model was proposed by Nowak and Grantham as a possible way of facilitating start-up success and business network formation. Their structure of incubation concentrated on virtual value chain and connecting start-ups with business expertise and strategic partners in the marketplace. It was a structural model on integrating IT with human resources and capital resources. Business incubation should be conceptualised around corporation's needs in continuous innovation (Booz, Allen and Hamilton, 2000). A process model with stage-gate of seven stages was introduced by Booz, Allen and Hamilton in the year 2000 highlighting corporate business incubation as a systemic tool for developing risky projects within corporate environment. 'New Economy Incubator' is usually funded by venture capital companies or set up by large multidisciplinary consultancies that are able to offer a complete range of technological advisory and other business support services (Lazarowich and Wojciechowski, 2002). There is a structural model conceptualising incubator as private-sector, profit-driven provider of virtual and physical services. A first comprehensive attempt to create a generic incubator model was made by Costa-David, Malan and Lalkaka in the year 2002. Incubation consists of pre-incubation, incubation and after care stages and effectiveness of incubation is measured through direct and indirect net impacts against stakeholders' objectives (Costa-David et al. 2002).

A profound process model on business incubation was given in 2004 by Sean Hackett and David Dilts. Incubator is the operationalization of a community strategy to promote the survival of new firms (Hackett and Dilts, 2004). The major contribution of this model is that an entrepreneur or the venture is regarded as the system of interest of the incubator. It considered incubator as an enabling technology rather than a critical or strategic technology. According to Moreira - Carvalho (2012), there are two questions about Hackett - Dilts (2004b) incubation model that the real option theory answers: which factors should be taken into account when selecting possible incubatees and whether predefined

criteria contribute to the economic results of incubation. According to Hackett - Dilts (2004b), the incubator's performance depends on the incubator's ability to create options and the selection performance typifies the capacity of the incubator. The resource-based view can offer an explanatory model on how corporate incubators function as specialized corporate units that hatch new businesses. (Gassman & Becker, 2006). Managing the resource flow requires the initial allocation of resources to the corporate incubator during its set-up as well as continuous resource flow to and from the technology venture by ensuring stability through senior management. It is only possible to evaluate the performance of a business incubator when confronting particular objectives and results of the incubator (Bergek and Norrman, 2008). They rejected the principle of a black-box model incubation model centered on results and concluded that selection of the incubatee is the main factor for reducing risk in the incubator's activity.

Business incubation is a part of a value chain which allows to think about long-term goals of innovation system as a whole. (Ewan, Jones 2010). A first value chain model was proposed that linked incubation process to the process in the innovation ecosystem and entrepreneur's lifecycle. Another powerful model was proposed by World Bank as a part of its InfoDev model. InfoDev model proposed in 2009 by World Bank works in five different areas: access to finance, agribusiness entrepreneurship, climate technology, mobile innovation and women entrepreneurs. The Info Dev model on business incubation focusses on establishing linkage between business incubation phases and entrepreneurial life cycle (InfoDev, 2009). It is basically a process model and splits incubation process in three stages: pre-incubation, incubation and post-incubation

### **Concept Development**

Throughout the literature on business incubation, incubation is seen as a mechanism for new venture creation, a mechanism for resource allocation, co-product of incubator-incubatee dyads, an outcome of network behaviour and as a controllable process. The model as proposed by the authors in this study is one of its kind as it explores the service quality perspective of business incubation. By and large the concept of service quality has been applied to services marketing literature and business incubation being a service, application of this novel perspective fits apt.

## Tenant Firm Selection

There are several types of incubators such as business, technology, academic etc. and each of them has certain parameters for selection and evaluation of tenant firms. Firm's age, innovative business idea, entrepreneur's initiative, sector specification plays a role in selection and monitoring of the firms. Slack in the selection criteria can lead to lesser usage of incubator's services (Brunnel et al., 2011). Selection practices impact subsequent tenant firms' survival rates (Aerts et al, 2007). Incubators usually select the tenant firms based on the background of the promoter, business idea, financial support required, growth potential, target market, milestones and expected deliverables. The proposed model will help in identifying the selection criteria and its effect on micro and macro outcomes. Therefore, the study formulates the following hypothesis:

*H1 Tenant firm's selection by the incubator affects its incubation outcome.*

## Incubation Services

Incubators are typically known to provide support to new enterprises during their early stages. Mainly, categories of services include access to (1) physical resources, (2) office support services, (3) capital, (4) process support, and (5) networking services (Carayannis & Von Zedtwitz, 2005). Sustainable incubation platforms and business models must be responsive to the changing contextual needs (Sarfraz Mian et al. 2012). They explored the role played by science and technology parks as regional platforms for incubating science- and technology-based businesses. They used multiple case analysis of established science and technology parks in USA and France and concluded that through provision of high-quality value-added services and employing professionally competent managers, modern STPs can emerge as sustainable platforms for providing incubation services. Business incubators provide their tenants with a mix of services encompassing infrastructure, business support services and networking (Bergek and Norrman, 2008; Hansen et al., 2000; Lalkaka and Bishop, 1996; Peters et al., 2004). Incubator's service portfolio can be improved through policy support and funding. When an incubate firm is selected for affiliation by the incubator, the firm has certain expectations and these expectations can be fulfilled when the incubator is able to provide adequate business support services to the incubatees. Government can

play an important role through funding and policy support which will enable incubators provide range of business support services, technological assistance, networking and other needed services. Hence the following hypothesis is formulated:

*H2 The chances of better incubation services increase in accordance with policy support and funding.*

## Service Quality of Incubation

Service quality perspective has been of great relevance in marketing literature. The key to providing superior service is understanding and responding to customer expectations (Parsuraman, Berry and Ziethaml, 1991). Companies are supposed to be accurate and dependable and provide the service they promised to provide. And in doing so, companies need to measure the satisfaction and expectations of its customers. Incubation centers also are required to measure the expectations of the tenant firms. Incubators provide variety of services ranging from physical, business support and networking services. The service quality instrument is being prepared in this study and it measures the following service quality dimensions: a) Tangible and reliable dimension – in terms of equipment, technology, forms and materials, infrastructure facilities, error-free services b) Responsiveness and communication dimension-in terms of problem solving skills of the staff, knowledge and clarity of the staff, prompt services, emergency services, courtesy and consideration c) Accessibility dimension-access to technology, access to education and research, access to equipment, access to office space and furniture, access to managerial assistance d) Liaison services- liaison with stakeholders, industry associations, professional experts, government departments and ministries. Thus, the study formulates the following hypothesis.

*H3a Effectiveness of incubation services are linked to fulfillment of service quality gaps.*

*H3b Fulfillment of service quality gaps lead to incubation outcomes.*

## Tenant Firm's Monitoring and Assessment

A tenant firm is continuously monitored by the incubator for its working and use of incubation services. Incubators thus act as catalysts of new entrepreneurial experiences (Maroto Sanchez and García Tabuenca, 2004). The value proposition in terms of business and innovation provided by incubators

impacts the performance of the associated firms (Bruneel et al., 2012). Therefore the firms need to be adequately monitored and assessed and timely intervention will avoid anticipated failures of the tenant firms. Operational and strategic activities of the firms can be proactively or reactively assessed by the firms. The firms can be monitored and assessed through their survival rates, employment creation, profit and growth statistics, networks created, patents acquired and capital raised. The following hypothesis is thus formulated,

*H4a: Tenant firms' selection/entry criteria and tenant firms' monitoring/assessment are correlated.*

*H4b Firms that are continuously monitored and assessed by the incubator have higher chances of survival and growth.*

### Tenant Firm's Expectation

As incubators have expectations from the tenant firms and wish for the success of the firms, likewise tenant firms also have expectations from the incubators. There is a perceived image of the incubator in the eyes of the tenant firms. Tenant firms highly value the credibility associated with acceptance by the incubator (McAdam and McAdam 2008). The firms believe that incubators are better equipped than the entrepreneurs for helping the new firms establish themselves in the market. Tenant firms look for wide array of services to be offered by the incubators for supporting them. Solving problems within a firm is the basic mechanism of capabilities creation and when a tenant firm affiliates with an incubator, it looks for such capability creation and co-problem solving. Thus, we formulate the following hypothesis:

*H5 Incubators measuring service quality expectations of tenant firms serve them better.*

### Mediating Role of Government/Policy Support

Funding decisions of investors are driven by the location of headquarter and R&D of hi-tech start-ups and by the educational experience of the founders. (Paola et al., 2018). Government grants, policy funding and investors take note of many factors before deciding to fund a venture and /or an incubator. Whilst there still remains a level of financial support for some incubators from one government or another, overall, as BIIA (2009) acknowledge on their website:...neither the federal nor state/territory

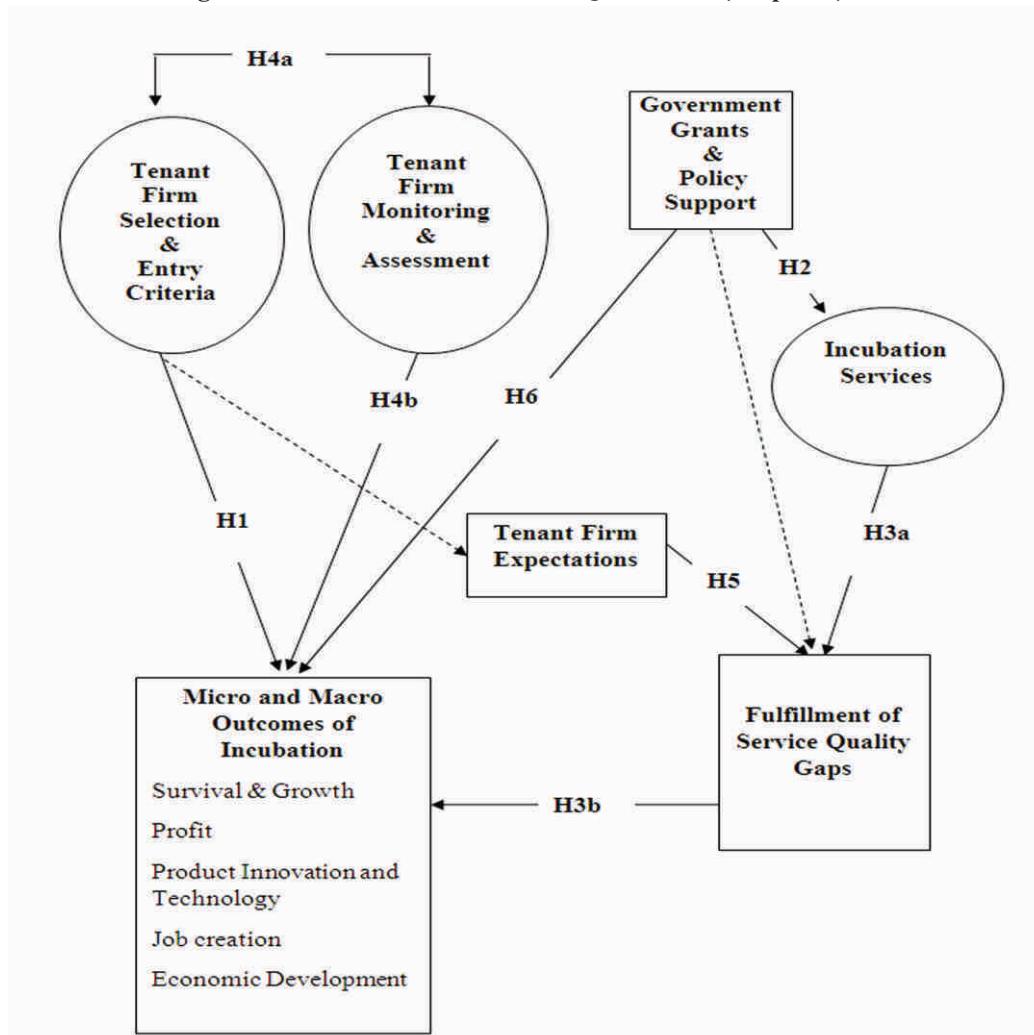
*governments have a program to support business incubators once established. It is anticipated that funding provided in response to the feasibility will enable the incubator to be self-sustaining...National government have adopted an approach of catalysing the initial formation of incubators rather than sustaining them in the long-run (Lane, 2009). There is a long-run equilibrium relationship between GDP growth and specified government spending. (Merza Ebrahim, Alhasan Noorah, 2016). The rate at which businesses grow is a significant factor to economic activity within a country as their growth and sustainability can greatly contribute to greater job creation and economic wellbeing.*

In this study, government support and policy will be examined by reviewing various schemes and finding out from incubators the assistance received by them in establishing the incubation center and in providing services to the tenant firms. These incubation centers receiving government funding contribute towards macro-economic goals of job creation, GDP growth and technology acceleration, therefore,

*H6 Policy support and government funding helps in achieving incubation outcomes.*

### Proposed Model

A detailed review of literature suggests that not many studies are undertaken examining the mediating effect of government in fostering entrepreneurship through business incubation. This study enjoys the pioneer advantage of consolidating inputs from the research across the world. One of the first business incubation models was given by Campbell in the year 1985 that focused on steps of business incubation. Another study by Smilor in 1987 highlighted incubator affiliation and tenant firm's outcome. A prominent incubation model called Infodev proposed by World Bank in 1989 documented the stages of business incubation. Hackett and Dilts in 2004 propounded the antecedents and outcome model of business incubation. A major source of this research will be the resource-based theory of Incubation by Gassmen and Becker proposed in 2006 and the dyadic theory of Incubation proposed by Hackett and Dilts. This study will base its postulates taking cues from gap model of service quality given by Parasuraman, Zeithaml and Berry (1985) and Zeithaml and Bitner (2003).

**Figure 1 : Business Incubation ServQual Model (Proposed)**

### Research Implications

Despite the apparent linkages between incubation and entrepreneurship, the existing literature has discussed the concepts such as incubator establishment, incubator-university linkages, degree of innovation etc. in an individualistic frame of reference. Prominent researchers who carried research in this field agree that there is a gap in this field of study (Norat Roig-Tierro, 2015; Hackett and Dilts 2004; Abdullah et al, 2007).

Sufficient attention is not paid in the existing literature on how government policy aids entrepreneurial climate through business incubation. Researchers have not focused on the service quality dimension of business incubators. No

studies have matched the incubatee firm's perception and satisfaction with incubator's service design, delivery and differentiation.

The model proposed through this study seems to narrow the research gap by undertaking a service quality gap analysis. There lies a vacuum in analysing the knowledge gap (incubator understanding the incubatee and vice versa), service design gap (understanding the service portfolio of incubator), conformance gap (incubatee perception of SERVQUAL) and communication gap (matching incubatee perception and satisfaction).

A few studies are done on how tenant firms are selected and monitored but gap exists in literature in understanding the

mediating effect of government policy on the outcomes such as technology acceleration, job creation, product development and success of the incubatee firm. Many studies in India focused mainly on technology-business incubators and science based enterprise and a few others examined the success of new enterprises. Significant studies have not yet discovered the aspects of service quality and government policy in business incubation.

### Conclusion

This study proposes a novel approach to understanding business incubation and offers to examine the mediating effect of the government thus will bring forth impact of supportive government intervention. It will help to strategise policy and reduce failures because the authors believe that policy customization (as sector-specific and start-up specific) will help to provide better support to the incubatee firms throughout their lifecycle. The service quality gaps identified thorough the model, if fulfilled, will bring greater impetus to start-ups because most start-up firms die in the initiation stage of their life cycle. A flexible-performance based financing model can be adopted by the government and the possibility of public-private partnership can be explored by policy makers. Business incubation should integrate skill based education and employment. The current education system is skill based promoted as NSQF (National Skill Qualification Framework) by Ministry of Education. This study will help students to become entrepreneurs.

This paper is a conceptual exploration with a proposed model and hypothesis. The model and the hypothesis are open for validation for future research.

### References

- Aashish Kumar. (2017). "Business Incubation Mechanism for Conducive Start-Up Ecosystem". *Journal of Management and Entrepreneurship*, 11 (1), pp. 67-80.
- Aert Kris, et al.. (2007). "Critical Role and Screening Practices of European Business Incubators". *Technovation*, 27(5), pp. 254-267.
- Australia and New Zealand Association of Business Incubators (2004). *Incubation Works: Case Studies of Australian Small Business Incubators and Their Impact*. Canberra: ANZABI.
- Bergek, A., Norrman, C. (2008). "Incubator best practice: A framework". *Technovation*, 28(1), pp. 20-28.
- Campbell, C., et al. (1985). "Stalking the Latent Entrepreneur". *Economic Development Review*, 3 (2), pp. 43-48.
- Carter, S. & Jones-Evans, D. (2000). *Enterprise and Small Business: Principles, Practice and Policy*. Harlow, England: Pearson Education Ltd.
- Centre for Internet and Society. (2017). Technology Business Incubators: An Indian Perspective & Implementation Guidance Report, 12-15. Retrieved May 20, 2020, from <https://cis-india.org/internet-governance/blog/technology-business-incubators.pdf>.
- El-Sokari, et al. (2013). *Entrepreneurship: an Emirati Perspective*. Global Entrepreneurship Monitor, UAE Report, Institute for Social and Economic Research, Zayed University.
- Ewan, Jones M. (2010). How to Create an Award Winning Incubator? Presented to the t SBI Conference, Liverpool. Retrieved on January 15, 2020, from <http://www.youtube.com/watch?v=Agj7Lun9vOY>.
- Frank T. Rothaermel, et al. (2005). "Incubator firm failure or graduation?: The role of university linkages". *Research Policy*, 34(7), pp. 1076-1090.
- Francisco Mas-Verdu, et al. (2015). "Firm survival: The role of incubators and business characteristics". *Journal of Business Research*, 68(4), pp. 793-796.
- Fu-Sheng Tsai, et al. (2009). "The Co-evolution of business incubation and national innovation systems in Taiwan". *Technological Forecasting and Social Change*, 76(5), pp. 629-643.
- Hackett, S. M., et al. (2004a). "A Systematic Review of Business Incubation Research". *The Journal of Technology Transfer*, 29(1), pp. 55-82.
- Hackett, S. M., et al. (2004b). "A Real Options-Driven Theory of Business Incubation". *The Journal of Technology Transfer*, 29(1), pp. 41-54.
- Jack. A. Nickerson et al.. (2006). "Envy, Comparison Costs, and the Economic Theory of the Firm". *Strategic Management Journal*, 29(13), pp. 1429 – 1449.
- Joanne L. Scillitoe, et al. (2010). "The role of incubator interactions in assisting new ventures". *Technovation*, 30(3), pp. 155-167.

- Johan Bruneel, et al. (2012). "The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations". *Technovation*, 32(2), pp. 110-121.
- Malecki E.J., et al. (1988). "Technology and regional development: some thoughts on policy". *Environment and Planning: Government and Policy*, 6(4), pp. 383 – 399.
- Mark. P. Price. (2002). "Co-production of business assistance in business incubators: an exploratory study". *Journal of Business Venturing*, 17(2), pp. 163-187.
- Mas Verdú, F., et al.. (2015). "Firm survival: The role of incubators and business characteristics". *Journal of Business Research*, 68(4), pp. 793-796.
- Michael Lazarowich, et al. (2002). *The Functioning of Business Incubator Organizations: Legal Framework, Finances, Governance Structure and Tenant Relations*. Russian Business Incubator Program, Ontario: School of Planning, University of Waterloo.
- Michael T. Schaper, et al. (2009). "Business Incubation in Australia: Policies, Practices and Outcomes". *Asia Pacific Journal of Innovation and Entrepreneurship*, 3(3), pp. 37-46.
- Merza Ebrahim, et al. (2016). "Public Spending and Economic Growth in the Rentier State: The Case of Kuwait". *Asian Social Science*, 12, pg.160.
- Nadia Di Paola, et al.. (2018). "Hi-tech start-ups: legitimacy challenges and funding dynamics". *Technology Analysis & Strategic Management*, 30:3, pp. 363-375.
- Nowak, M. J., et al. (2000). "Virtual Incubator: Managing Human Capital in the Software Industry". *Research Policy*, 29(2), pp. 125-134.
- Oliver Gassman and Barbara. (2006). "Towards a resource based view on corporate incubators". *International Journal of Innovation Management*, 10(1), pp. 19-45.
- Parasuraman, A., et al. (1991). "Understanding Customer Expectations of Service". *Sloan Management Review*, 32(3), pg. 39.
- Paul D. Hannon. (2005). "Incubation policy and practice: building practitioner and professional capability". *Journal of Small Business and Enterprise Development*, 12(1), pp. 57-75.
- Sarfaraz Mian. (1996). "The university business incubator: A strategy for developing new research/technology-based firms". *The Journal of High Technology Management Research*, 7 (2), pp. 191-208.
- Sarfaraz Mian, Wadid Lamine and Alain Fayolle. (2016). "Technology Business Incubation: An overview of the state of knowledge." *Technovation*, 50(51), pp. 1-12.
- Smilor, R. W. (1987). "Managing the Incubator System: Critical Success Factors to Accelerate New Company Development". *IEEE Transactions on Engineering Management*, 34(4), pp. 146–156.
- Teresa Fernández, et al.. (2015). "Business incubation: innovative services in an entrepreneurship ecosystem". *The Service Industries Journal*, 35(14), pp. 783-800.

\*\*\*\*\*

# Disruptive Human Resource Practices: Agile Firms



**Dr. Selvam Jesiah**  
 Professor of Management  
 Sri Ramachandra Institute of  
 Higher Education and Research (SRIHER)  
 Porur, Chennai  
 Email: sjesiah@gmail.com



**Dr. Murugaiyan Pachayappan**  
 Assistant Professor  
 Indian Institute of Management Sirmaur  
 Sirmaur, Himachal Pradesh  
 Email: pachayappanvn@gmail.com

## A b s t r a c t

The paper examines the extent of disruptions in human resource practices of agile firms and articulates how human resource practices are disrupted owing to technology and culture forced. Human resources practices are compelled to adapt to the new design and style of functioning whereby human resource as a functional area has become vulnerable to many challenges owing to the volatility of business led by the frequent changes. The human resource unit of any organization should be very quick to understand the nature, magnitude, and duration of the change happening. Otherwise, it cannot help define strategy suiting to the volatilities of the current environment.

**Keywords:** *Human Resource Practices, Disruptions, Business Environment, Eusiness Changes, Technology and Culture.*

The rate of disruption in management practices is accelerating. Earlier, the turmoil of change used to be an offshoot of, certain period of stabilization when companies could adapt to learn new skills, reengineer processes, and stabilize. Then, came the times of continuous change; where companies have incorporated dynamic relationships and moving targets in work processes. Now, came the times that are characterized by exponential overlapping change; with one change impacting other changes. In 1990s US military developed the concept of describing and understanding their environment, which was later termed as VUCA, indicating the Volatile, Uncertain, Complex and Ambiguous world that exists now. Shifting demographic trends, geopolitical shifts, unprecedented economic challenges and unstoppable acceleration in technological innovation are all creating a context for new business models that encompass agility, adaptability, and resilience. Existing business behaviors and cultures are put to scrutiny on how the balance of contrasting stability and flexibility is maintained. "Be Disruptive before disrupting the markets"—companies need to disrupt themselves first, or at least make an attempt. Most companies fail at that since it is extremely difficult to unlearn, learn and relearn according to the demands of change.

### **Why HR Practices Matter in Disruptive Environments?**

The dynamics of new global business have changed the way organizations set their goals. Contributions of human resource to businesses are recognized as a way to raise acceptable business practices to benchmark business activities and performance. Human resource systems have the challenge of re-skilling HR function itself and finding ways to re-align & re-engage employees according to the business goals. Bersin (2015) asserts that "Gut feel" decisions have to be replaced by data-driven decisions: whom to hire, whom to promote, what career paths to facilitate, how much to pay people—and even where to locate a facility, how big an office someone needs, and what type of food to be served in the cafeteria. Human Resource function has to understand the nature, scale and duration of the change experienced by the organization in order to help define and change strategy.

Human resource has come a long way through four waves of evolution. The first wave has human resource function in

administration role of terms and conditions of work, regulatory compliance, delivery of human resource services like personal record management, attendance management, payroll, recruitment, and especially performing these functions cost-effectively. The second wave has seen designing of innovative human resource practices like sourcing, compensation or rewards, learning, and communication. The third wave has emerged with strategic dimension, connecting the individual and integrated human resource practices with business goals. The fourth wave is "HR from the outside in" that devised HR practices in response to external business conditions and stakeholder expectations (Ulrich et al., 2015). The human resources function is vital and the center of most important decisions in any business, rapidly widening its influence in, and impact on the workplace. It is the human resource system that helps people to cope with disruption and help organizations evolve faster. Human resource listens to, and acknowledges the organizational goals, talent needs in fluid markets and delivers value to the organization. HR software is not anymore the functional feature set, but rather the "degree of user engagement". Rather than being disrupted, people, systems and organizational setting need to be disruptive towards needs and demands of changing environment. Good HR practices endure learning and agile cultures and let employees give out higher work productivity resulting in customer and investor satisfaction. Ulrich and Lake (1990) remarked that "human resource management system can be the source of organizational capabilities that allow firms to learn and capitalize on new opportunities. Accordingly, HR systems must engage in identifying the strategic work that is truly necessary to execute firm strategy, investing in differentiated management systems that support that work; and designing and implementing targeted measurement systems".

### **Disruptive Hr Practices In Agile Firms**

Demand for accountability is on every business function including that of human resource. Since talent acquisition and development is the critical differentiator for strategic intentions, human resource is accountable for market success in every sector. This necessitates HR to articulate the

logical connections between progressive human resource practices and firm (Cascio and Boudreau, 2011). It is in line with illustrations of Peter Cheese (2015) that HR has to bring of less PowerPoint and more of Excel. The disruptive human resource practices can be viewed broadly under technology-driven and cultural practices.

### **Technology-driven practices**

Majority of the HR disruption is enabled by disruptive Information Technology being adopted and assimilated across the firm. Estimated to be more than a \$15 billion market, human resource technology is creating smarter people and better working environment. Lean and technology enabled human resource teams to adapt fast to partnering with business leaders in creating impactful HR functions (Bersin and Associates, 2011).

**Talent Management:** Studies found that the factors like overall spending levels, business structure and team size have far less impact on business performance than skills of human resource professionals themselves. There is accelerated growth in innovative technologies in human resource space in social and referral recruitment, talent analytics, e-learning, and performance appraisals. Digital human resource and social media are the game changers (Accenture and Success Factors, 2015). Research shows the predominant reasons for adopting cloud technologies for disruptive human resource as faster software updates and lower software cost ownership (PwC HR Technology Survey, 2014). Employees are hired through referrals from structured talent databases on social media like LinkedIn, Indeed, and Glassdoor. The public profile of prospective employees forms the base of the referral system. Software runs on mobile phones, job applicants can directly apply through apps with a click, cite LinkedIn profile, appear for an interview over Skype or similar and take an online assessment as they apply. Networking with advertisers and talent hunters for candidate data management and application tracking is the practice. Technology is

connecting open jobs to talent all over the world as never before. Skill assessment, training needs and performance review based on work engagement, real time feedback, big data and “social sensing” so as to create best fit for the employees with organizational goals.

### **Learning and Performance Management Systems:**

Learning modules based on employee context are “fully integrated with work” in the form of e-learning or MOOCs. It is not when they have time, they take to learning. New learning management systems and technologies now integrate learning with talent and performance.

**Employee “self-service” applications:** Human resource systems manage huge amount of employee data. Disruptive technologies have extended the usage of HR systems beyond the original HR managers, to be used by employees as “self-service” applications and allow an employee to log on to a computer system/ mobile app which was developed by the company, and complete his daily tasks at work, monitor attendance, look for benefits and training programs for his future growth, conduct assessments and provide feedbacks with just few clicks. Also, this allows the HR managers to be relieved from routine tasks and focus on creative tasks.

**Data Driven Decisions:** Knowledge management has become the most valuable core asset for any business in the world. Corporations continue to grow but be fundamentally driven and transformed by knowledge, and have developed the capacity to execute on that knowledge. Knowledge insights derived from data analysis on employee recruitment and selection, employee training and performance provide value proposition by helping in strategic HR decisions (See Table 1). Only 4 percent of big companies have the ability to predict and model workforce, but 90 percent can model and predict their financial expenses and results (Deloitte, 2016). Top three investment areas in HR technologies are data analytics, data mining and visual dashboards, the intentions being quality of decision making, speed of decision making and to improve planning & forecasting (IDG enterprises, 2015).

**Table 1: Disruptive HR Practices**

Accenture	Mobile tools, social media to deliver HR services; Employee self-service; customization for talent management; cloud-based HR solutions; using analytics for deeper insight especially from social media (Accenture strategy, 2015).
Cognizant	Cloud based HR outsourcing; Talent –as- a- Service (TaaS) for talent management; Predictive analytics for Employee engagement (Cognizant, 2014).
GE	“GE’s Workout enables teams to reduce overload of internal data such as meetings, reports, approvals, paperwork, and processes; Key customers receive senior-level leadership courses, while GE’s employees get in-depth exposure to their most important customers; departmental big data analytical capability by recruiting the right talent, providing the appropriate performance metrics”. (Brockbank, 2015)
Hindustan Unilever Limited	In India, the newly recruits spend up to a month or more living among the poor in rural places, who comprise “the wealth at the bottom of the pyramid.” (Brockbank, 2015)
IBM	“Employee’s propensity to leave” analytics, Employee social engagement analytics, Skill inventory Apps (Gherson, 2015)
Infosys	Replacing hierarchy with camaraderie and flexibility; multi-location workplace; Intrapreneurship (Rajiv Raghunandan, 2012); web-based integrated training and management, Diversity and inclusion (Bikramjit Maitra, 2007)
Wipro	70:20:10 is a reference model framework for learning; built on the observation that most learning happens as part of the daily workflow; “program” hiring (Wipro, 2016)

**Work-Life integration with Mobile Applications (apps):**

The coalition of work with life that began with the internet, and accelerated through smart phones is making it possible for work to be done anywhere, anytime, by anyone. Mobile apps are very handy, single-function systems and they work on simple swiping mechanisms are fast and efficient. In a mobile device, the users go for “tap and swipe” rather than “click and type.” Doing work anywhere, everywhere and being able to have a life is facilitated by technology. It is estimated that there may be 500 million internet users in India (Economic Times (2018) citing an Internet Users report of Internet and Mobile Association of India), adding 10 million active internet users per month (Business Standard, 2018). The growth is phenomenal owing to broader availability of low cost data access and robust mobile share of web traffic (Mary Meeker, 2017) which makes access to HR applications over mobile higher than that of personal computers. Instead of mobile versions, modern companies should rely more on mobile apps to

engage with employees. Though web applications do continue to be used, the priority is on readily handy mobile phone and HR has to prioritize “mobile first” Apps and look for ease of usage mechanics, user interface, and design of mobile apps.

**Cultural HR Practices**

Technology enabled high performance HR systems promote the culture of development planning in organization. This acts as a reverse modeling to influence a high impact culture derived from technological discipline in organizational human resource management without explicit practices. The non-technological disruptive HR practices include,

**Diversity in Talent Acquisition:** HR can design for employees tailor options for development and to pursue job openings. This is possible if HR can transform itself as marketing function. Acquiring multi-specialist who can connect these multiple specialties is another option. Each requires the other for maximum value realization.

**Cultural diversity inclusion in workforce:** In times when internet has erased geographical barriers, organizations are competing for customers globally. Customer service competency can be developed by promoting multiculturalism. Workforce inclusion from different cultures and mindsets encourages out of box thinking, and provides novel solutions. New ways of working that connect people anywhere in the world is highly required (Selvam. J. & Lakshmi, K.U., 2013).

**Managing virtual teams located across multiple locations:** Every place has become the right place to work: home, cafeteria, coffee shop, hotel, car, lounge in hotels, aero plane and so on (Mulot, 2015).

**Employee engagement:** The fact is that satisfied employees are highly productive while demonstrating more creativity. Investing in training and development, providing special benefits such as paid volunteer time, gym memberships, and flexible scheduling options, participatory management that gives employees a voice in matters of their welfares improves employee engagement, employee satisfaction, and profit maximization (Gorman, 2015).

**Cultural stewardship:** Shared mission and values can guide employee decisions and behaviors in a fluid and uncertain environment. Flexible and multi-skilled teams, frequent and transparent communication, empowered small teams for agility (Yeung, 2015).

## Conclusion

According to the Industry Trends in Human Resources Technology and Service Delivery Survey (2014) by Information Services Group (ISG), human resource technologies that create massive economies of scale for HR customers and deliver consumer-like experience for employees via mobile and social capabilities, Real-time workforce visibility and flexibility enable organizations to respond to changing market conditions. HR disruptions are accompanied by disruptions in information technology. New technologies have to be integrated into business processes effortlessly and HR has to drive the people for alignment with long term objectives of the organization. Any organization failing to align its employees for managing new opportunities and challenges through 'skill sets makeover' may fall terribly under the list of dead companies. HR managers must take a proactive role in

preventing organization from the fallacies of skill set makeover and at the same time managing vulnerabilities of organizations to the IT and other technological disruptions.

## References

- Accenture (2015) Building the digital HR organization: Accenture and success factors on the changing nature of HR, Accenture. <http://Accenture-Accenture-Digital-Disrupts-HR.pdf> (accessed 19 November 2018).
- Bersin and Associates (2011) Global growth creates a new war for talent. First Quarter, 2011. (online). <http://marketing.bersin.com/TalentWatchQ12011.htm> l.(Accessed on 22 November, 2018)
- Bersin, J. (2015) 'HR's role in the digital workplace: A time for reinvention' in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HR Certification Institute, pp. 19-24.
- Bikramjit Maitra (2007) Human Resource Development. Analyst Meet, 2007, Think Flat. Infosys.
- Brockbank (2015) 'HR's role in a world of pervasive information'. in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HR Certification Institute (HRCI), pp. 295-300.
- Business Standard (2018) India is adding 10 million active internet users per month. [https://www.business-standard.com/article/current-affairs/india-is-adding-10-million-active-internet-users-per-month-google-118062700882\\_1.html](https://www.business-standard.com/article/current-affairs/india-is-adding-10-million-active-internet-users-per-month-google-118062700882_1.html). (Accessed on 12 November, 2018)
- Cascio, W., and Boudreau, J. (2011) "Investing in people, Financial impact of human resource initiatives," Second edition, Pearson Education, pp.1-16.
- Charles Jennings (2016) "The future of 70:20:10 learning. in Future of work," *LPS Quarterly*, 2nd Edition, Wipro..
- Cheese, P. (2015) 'The future of HR: a context of change and opportunity". in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HRCI, pp. 361-366.

- Cognizant (2014) "Talent as a service: Enabling Employee Engagement While Boosting Efficiencies." *White paper*, October 2014.
- Deloitte(2016) "HR Technology Disruptions for 2017: Nine trends reinventing the HR software market," Deloitte.
- Economic Times (2018) Internet Users in India expected to reach 500 million in India by 2018: IAMAI. <https://economictimes.indiatimes.com/tech/internet/internet-users-in-india-expected-to-reach-500-million-by-june-iamai/articleshow/63000198.cms> (Accessed on December, 2018)
- International Data Group (IDG) Enterprise (2015) Big Data and Analytics: The Big Picture.
- Gherson,J.D. (2015) 'HR disrupted: the next agenda for delivering value'. in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HRCI, pp. 303-308.
- Gorman,G. (2015) 'CEOs want better performance. Great culture can make it happen', in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HRCI, pp. 179-187.
- Mary Meeker (2017) Internet trends. Kleiner Perkins Caufield & Byers Report, <http://www.kpcb.com/internet-trends>. (Accessed on 22 December, 2018)
- Mulot,R. (2015). HR from around the world ... let's unite! From corporate hr to global human capital platform. in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HRCI, pp. 129-134.
- PwC (2014) HR Technology Survey, 2014, PwC.
- Rajiv Raghunandan (2012) Workplace of tomorrow, Chaotic organization or Organized Chaos. Infosys.
- Selvam. J. and Lakshmi, K.U.(2013) 'Workforce diversity at Accenture: A Key to Corporate Success', in Bindu Gupta. et al (Eds), Resource book on Case Studies in Business Management, Ane Books Pvt. Ltd., New Delhi.
- Silverstone,Y.,et.al. (2015) HR drives the Agile organization. Accenture Strategy, Accenture.
- Ulrich, D., et al.. (2015) Introduction- Context to Strategy. in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HRCI, pp. 13-19.
- Ulrich,D., and Lake,D. (1990) Organizational capability: Competing from the inside out. John Wiley & Sons, Inc., NY.
- Yeung (2015) "Winning in the mobile internet era: what should hr know and do to be effective?" in D., Schiemann,W.A., and Sartain,L.,(Eds.), In The Rise of HR, Wisdom from 73 thought leaders, Ulrich, HRCI, pp. 157-163.

\*\*\*\*\*

# Employees' Intention to Stay: Mediating Role of Work-Life Balance

**P. Prasanthi**

Research Scholar,

School of Management, Hindustan Institute of  
Technology and Science, Chennai.  
Email: santhiponduri@gmail.com**Dr. Geevarghese**

Professor, School of Management,

Hindustan Institute of  
Technology and Science, Chennai.  
Email: gvsam3@gmail.com**A  
b  
s  
t  
r  
a  
c  
t**

Employers are concerned about the employee attrition in organizations. This research work is to find out the impact of perceived organizational support on employees' intention to stay with work-life balance as a mediator. Two hundred fifty employees in IT sector in Chennai region were explored for this research. It indicates that the employees of IT sector in Chennai have higher level of work life balance and their perception about the organizational support is good. The correlation and regression analysis are used to find out the relationship and impact of research variables. Results revealed that Perceived Organizational Support (POS) has a positive and significant relationship with intention to stay and work-life balance act as a partial mediator.

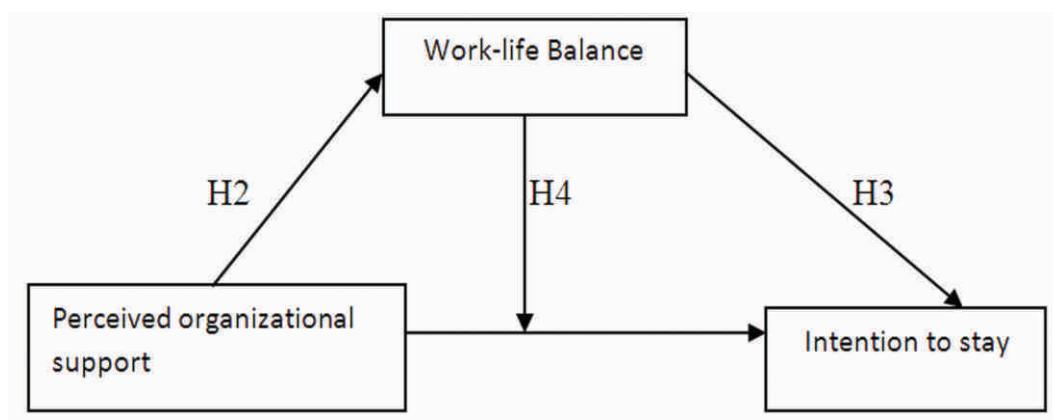
**Keywords:** *Perceived Organizational Support, Employees, Work-life Balance, Intention to Stay, IT Sector.*

In today's dynamic work environment, there is a change in working hour's pattern compared to standard hours, normally starts at 9 am and end at 5 pm (Bharath, 2009). The technological changes in the global market have led to the change in belief, values, attitudes, perspectives, thinking and behaviour of the human beings at their workplace and home which influences their personal, work and family life (Geevarghese & Devi K.K.S., 2018). The technology has made it easy to be in constant touch with employees day and night by the organizations (Morgan, 2003). Due to the increased workload, employees are pressurized, and they are forced to concentrate more on work and less on personal life. According to Bhagwagar, (2009), employees' lost the balance between work and family life due to stress and imbalance of work. Today's organizations and employees took work-life balance as one of the important challenge (Sturges, J., & Guest, D., 2004). Additionally, changes in workforce demographics and rapid increase in female employees led to more conflict in work-life from the past decades (Boyar et al., 2005). Imbalance in Work-life leads to negative results like less job satisfaction, decreased performance which ultimately leads to turnover intention (Suriency et al., 2014). Consequently, organizations incur high costs in recruiting and training new employees due to employee attrition.

Organizational identification is a feeling of belongingness which promotes an individual to identify himself/ herself

with an organization and desires to be part of that organization (Geevarghese & Pathmu, R.B., 2018). There are several factors which affect the turnover intention of employees in an organization. One of the major factors of turnover intention is perceived organizational support(POS) (Dawley et al., 2010). POS which captures an employees' perception on the degree to which an organization values his/her contributions and cares for his /her well-being, has gained more attention of employers in their employee development and welfare initiatives (Geevarghese & Shyjo, 2018; Rhoades & Eisenberger, 2002). Many organizations have given importance and also have a strong aim to address the importance of employees' work-life balance. This further prompted organizations to introduce interventions like supervisory support, job enrichment, developing work-family culture and other benefits for the employees to balance their work-life. (Baral & Bhargava, 2010).

In the present research work, we identify the impact and significance of perceived organizational support on work-life balance of employees' and their intention to stay in IT sector organizations' in Chennai region. Since work-life balance is one of the factors influencing employees to stay with their organizations, researchers have undertaken to find out the relationship among perceived organizational support, Intention to stay and work-life balance.



**Fig.1. Conceptual framework of research**

## Literature Review

### ***Perceived Organizational Support:***

Perceived organizational support is the degree of perception of employees' that the extent to which organizations will give support to the employees, values their contribution, taking care of well-being of employees and also fulfills their socio, economical and emotional needs (Rhoades & Eisenberger, 2002). Organizational support improves the commitment of employees towards the organization and helps to achieve the goals of the organization (Eisenberger et al., 1986). Organizational support tends to create positive work attitude in employees and improves their performance as well (Rhoades & Eisenberger, 2002) and also influence positive mental health (Hao et al., 2016).

### ***Perceived organizational support and intention to stay:***

Policies of management which supports employees' play an important role in increasing the commitment and retention of employees in the organization (Perryer et al., 2010). Organizational support is one of the positive aspects which have a strong impact on employee's turnover intentions (Mowday, 1998). In a study on Malaysian Bank employees, it has been reported that perceived organizational support boost the commitment of employees which ultimately leads to less turnover intention (Talat Islam, 2013). Employees' turnover intention is the reverse of intention to stay (Kim et al., 2001). Therefore, hypothesis:

H1: perceived organizational support has a significant positive relation with the intention to stay.

### ***Perceived organizational support and work-life balance:***

Perceived organizational support reduces the influence of work-family conflict (Huang et al., 2007). Organizational support reduces the work-life conflict and helps to increase the enrichment of employees' work-family life through interdependence path that boosts the employees' ability to manage and balance work-family life with the aid of different policies of the organization (Voydanoff, 2004). Organizations can help employees to reduce the work-life conflicts by offering some benefits like health insurance, pensions, paid vacation, emergency leave, child care, flexible working time, eldercare policies (Kossek, Distelberg, 2009). Work-life balance can also be influenced positively by their supportive supervisors in their respective organizations (Thomas, Ganster, 1995). Employees will perform better at their workplace if the organization supports their work-family life (Allen, 2001). In a study on banking employees in Padang, researchers reported that perceived organizational support has a positive and

significant influence on employees' work-life balance (YukiFitria, MuthiaRoza Linda, 2018). Hence, hypothesis:

H2: Perceived organizational support has a positive and significant relationship with work-life balance.

### ***Work-life balance and intention to stay:***

Turnover intention is a feeling of employees that they want to leave the organization (Green et al., 2013). According to Hughes & Bozionelos (2007) one of the important factors which influence employees to leave the organization is work-life balance. If there is no leisure time to spend with the family due to work pressure, there is no value to the pay received by the employees (Surienty et al., 2014). The employees are happy at work only when they are happier in their family and personal life (Gachter et al., 2013). Researchers have reported that work-life balance is negatively related to turnover intention (Surienty et al., 2014). Employees who balance their work-life at higher levels have a lower intention to leave the organization (Gatchet et al., 2013). Further studies have revealed that work-family conflict enhances intention of employees' to quit the organization (Anderson et al., 2002). In another study conducted on pharmacy by Lindfelt T, et al., (2017) reported that work-life balance is the significant factor which motivates the employees to stay with the organizations. Therefore, hypothesis:

H3: Work-life balance has a positive and significant relationship with intention to stay.

### ***Mediating role of work-life balance:***

In various researches on employees' intention to stay, work-life balance has been identified as one of the significant factors for the employees to remain with the organization. Further considering the positive relationship between the perceived organizational support and work-life balance and positive relationship between organizational support and intention to stay, we assumed that the impact of perceived organizational support on intention to stay is through the mediation of work-life balance. It means the employees' who experience more work-life balance will stay with the organization because they expect organizational support. Hence, hypothesis:

H4: Work-life Balance mediates the relationship between perceived organizational support and intention to stay.

### ***Methodology:***

#### ***Data collection:***

300 questionnaires were personally distributed among employees working in IT sector in Chennai region and 268

responses were received. 18 questionnaires were partially filled in and could not be included for the research. 250 questionnaires were taken for analysis. Table.1 shows the demographics of the respondents. There are 63.2% male respondents and 36.8% female respondents. 32.8% of the respondents are in the age group of 21-25, 23.2% of the

respondents are in the age group of 26-30, 27.2% of the respondents are in the age group of 31-35 and 16.8% of the respondents are in the age group of 36-50. Out of 250 participants, 61.6% of the respondents are single and 38.4% of the respondents are married.

**Table1. Demographic variables**

Variables	Category	frequencies	percentage
Gender	Male	158	63.2
	Female	92	36.8
Age	21-25	82	32.8
	26-30	58	23.2
	31-35	68	27.2
	36-50	42	16.8
Marital status	Married	154	61.6
	Unmarried	96	38.4
Total		250	100

### **Instrument/Scales**

Standard reliable and validated questionnaires have been used to measure all variables involved in this research. The responses are collected on a five-point Likert scale from “1=strongly disagree” to “5=strongly agree”. Perceived organizational support has been measured with 8 item scale developed by Eisenberger et al., (1986). Work-life balance is measured with 10 item scale developed by Netemeyer et al., (1996). Intention to stay is negatively correlated with turnover intention of employees' (Mobley, 1982; Mowday et al., 1982; Black and Stevens, 1989; Tett and Meyer, 1993). Thus, in the present study, employees' intention to stay is measured using a 6 item reverse coded turnover intention scales developed by Bothma, C.F.C., & Roodt, G. (2013).

### **Data Analysis and Results:**

Table 2 shows mean, standard deviation and internal reliability of variables and Table 3. Shows the data about correlations and significance of variables. The recommended steps to test the mediating relationship are (1) The independent variable have a significant relationship with the dependent variable, (2) Should have significant relation between the independent variable and mediator variable and (3) after entering the mediator the significant relationship between independent and dependent variables will change, i.e., the relationship is fully mediated if the relationship between the independent variable and

dependent variable becomes insignificant after entering mediator but if the relationship between independent and dependent variable still significant and decreases the effect of relationship, it is partially mediated (Baron & Kenny , 1986).

Table 4 shows the results of the above steps. Step1 shows the significant positive relationship between perceived organizational support and intention to stay ( $\beta=0.525$ ;  $P=0.000$ ), thus H1 is supported. Step2 explains that perceived organizational support and Work-life balance have significant positive relationship ( $\beta=0.377$ ;  $P=0.000$ ), hence H2 is accepted. Step3 reveals that Work-life Balance is positively significant concerning the intention to stay ( $\beta=0.667$ ;  $P=0.000$ ). Thus H3 is also supported. Further, after entering mediator variable (Work-life Balance) the relationship between perceived organizational support and intention to stay still remained as significant but the effect of the relationship between them decreased i.e.,  $\beta$  value decreased to 0.318 from 0.525. It means Work-life Balance partially mediates between perceived organizational support and intention to stay. This partial mediation explains that work-life balance is not only the mediator, but there must be other mediating factors which establishes the relationship between perceived organizational support and intention to stay; hence H4 is partially supported.

**Table 2. Mean, SD and internal Reliability of variables**

Research Variables	Mean	Standard deviation	Cronbach alpha
Perceived organizational support	2.82	55.21	0.7
Work-life Balance	2.76	74.65	0.89
Intention to Stay	2.62	99.97	0.91

**Table 3. Correlations and significance of variables**

		Intention to stay	Perceived organizational Support	work life Balance
Pearson Correlation	Intention to stay	1.000	.525**	.667**
	Perceived Organizational support	.525**	1.000	.377**
	work life Balance	.667**	.377**	1.000
Sig. (1-tailed)	Intention to stay	.	.000	.000
	PerceivedOrganizational support	.000	.	.000
	work life Balance	.000	.000	.

Note: \*P value &lt;0.05; \*\*P&lt;0.01

**Table 4. Results of Mediation model using Regression analysis**

Steps	Variables	Beta	R Square	R square (adj.)	F value
1	POS → Intention to stay	0.525**	0.275	0.272	94.19
2	POS → WLB	0.377**	0.142	0.139	41.17
3	WLB → Intention to stay	0.667**	0.444	0.442	198.27
	POS → Intention to stay (after entering WLB as mediator)	0.318**	0.531	0.537	139.98

Note: \*P<0.05 ; \*\*P<0.01  
POS: Perceived organizational support ; WLB: Work -life Balance

## Discussion:

The above results show that perceived organizational support has a significant positive relation on intention to stay, the meaning is that if organizational support is good and cooperative, it helps employees' to boost the level of employees' intention to stay with the organization. Work-life balance also has a positive and significant relationship with intention to stay. It shows that more employees balance their work & personal life. They are motivated to remain with the organization. Moreover, the indirect effect of perceived organizational support on the intention to stay through work-life balance has a significant positive relationship. But the direct effect between perceived organizational supports

on intention to stay is greater than the indirect effect through mediator variable (work-life balance). It indicates that employees' perception is good about organizational support. Thus ultimately, employees are motivated to remain with the organization.

The results of this study are similar to the work studied by Wayne et al., that work-life balance affects their intention to leave the organization (Wayne et al., 1997). If the perceived organizational support is high, there is a lower desire in employee's to leave the organization (Eisenberger et al., 1986). It has been revealed that work-life balance is a significant factor which affects the employees' intention to stay(Lindfelt, et al., 2017). Results of this research work

confirm the previous studies which are undertaken in 1986, 1997 and 2017 as the results are in line with results of the previous studies.

### **Conclusion:**

From the above research study, it has been concluded that perceived organizational support has a positive and significant relation with work-life balance as well as employees' intention to stay. It indicates that the employees of IT sector in Chennai have higher level of work life balance and their perception about the organizational support is good. The employees are able to balance their work, family and personal life. They also fulfill their other responsibilities at home.

### **Practical Implications:**

Employees in the form of human capital are the most important asset for any organization. Especially in IT sector technical and experienced employees play a significant role in the success and growth of the organizations. Retaining experienced employees in IT sector is a major challenge for their employers for the smooth running of the business. This trend will also help in reducing the cost in recruiting and training new employees. This study helps IT organizations to understand the effect of perceived organizational support and work-life balance on employees' intention to stay with the organizations. Further, it helps organizations to understand the need for maintaining a culture which will enhance the work life balance and perceived organizational support of employees which in turn will reduce the attrition level.

### **Limitations Future Study**

The findings of the research have some limitations which need to be considered and addressed in the future study. Respondents are only from Chennai, and the research work is carried out only in the Chennai region. Since the study is limited only to IT industry, it is possible that the findings may be different in other industrial sectors.

### **References:**

- Anderson, S. E., et al. "Formal organizational initiatives and informal workplace practices: links to work-family conflicts and job-related outcomes." *Journal of Management*, Vol. 28 No. 6, pp. 787-810, (2002).
- Allen TD. "Family-supportive work environments: The role of organizational perceptions." *Journal of Vocational Behavior*, 58:414-435. (2001).
- Baron, R. M., et al. "The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations." *Journal of Personality and Social Psychology*, Vol 51(6), PP. 1173-1182, (1986).
- Bhagwagar, H., "Need for Workplace Counseling in India." Retrieved from <Http://prod.bolohealth.com/healthzones/21-total-health/article/165-needfor-workplace-counseling-in-india>, (2009)
- Bothma, C.F.C., et al. "The validation of the turnover intention scale." *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur*, 11(1), Art. #507, 12 pages. <http://dx.doi.org/10.4102/sajhrm.v11i1.507>, (2013)
- Boyar, S. L., et al. "The effects of work-family conflict and family-work conflict on nonattendance behaviors." *Journal of Business Research*, 58 (7), pp. 919- 925, (2005).
- B. Bharat, Longer working hours for computer software engineers, India, 2009. [Online] Retrieved from: <http://www.saching.com/Article/Longer-working-hours-forComputerSoftware-Engineers-India/1088>. Accessed on 25 May 2016.
- D. Dawley, J.D. et al "Perceived Organizational Support and Turnover Intention: The Mediating Effects of Personal Sacrifice and Job Fit," *Journal of Psychology*, vol. 150, no. 3, pp 238-257, (2010).
- Green, A. E., et al. "Transformational Leadership Moderates the Relationship Between Emotional Exhaustion and Turnover Intention Among Community Mental Health Providers." *Community Mental Health Journal*, 49:373-379, (2013).
- Gachter, M., et al. Retaining the thin blue line: What shapes workers' intentions not to quit the current work environment. *International Journal of Social Economics*, 479-503, (2013).
- Geevarghese et al.", Impact of organizational support on executives' personal and social life: An empirical study among the executives of large scale public sector manufacturing organizations across India". *Journal of Computational and Theoretical Nanoscience*, 15(11-12), pp. 3576-3579, (2018).
- Geevarghese et al. "Effect of tenure on executives' organizational identification-an empirical study in the aviation sector among the junior and middle level

- executives employed in aviation sector organizations across India". *Journal of Computational and Theoretical Nanoscience*. 15(11-12), pp. 3576-3579, (2018).
- Geevarghese and Shyjo Johnson. "Effect of Human Resource Practices on Perceived Organizational Support among Aircraft Manufacturing Sector Employees," *Journal of Adv Research in Dynamical & Control Systems*, Vol. 10, 05-Special Issue, (2018)
- Hao J., et al."Perceived organizational support impacts on the associations of work-family conflict or family-work conflict with depressive symptoms among Chinese doctors." *Int. J. Environ. Res. Public Health.*; 13:326. doi: 10.3390/ijerph13030326. (2016)
- Huang Y., et al."The work-family interface and job performance conscientiousness and perceived organizational support as moderators." *Chin. J. Appl. Psychol.*; 13:65–72. (2007)
- Hughes, J., et al. Work-life balance as source of job dissatisfaction and withdrawal attitudes; An exploratory study on the views of male workers." *Personnel Review*, Vol. 36 No. 1, pp. 145-154, (2007).
- Islam, T, et al. "Organizational learning culture and leader-member exchange quality: The way to enhance organizational commitment and reduce turnover intentions", *The Learning Organization*, Vol. 20 No. 4/5, pp. 322-337. (2013)
- Kossek E, et al. "Work and family employment policy for a transformed work force: Trends and themes." In: Crouter N, Booth A, editors. *Work-Life Policies*. Washington, DC: Urban Institute Press;.. pp. 1–51. (2009)
- Lindfelt T, et al. "The impact of work-life balance on intention to stay in academia: Results from a national survey of pharmacy faculty, Research in Social and Administrative Pharmacy," <http://dx.doi.org/10.1016/j.sapharm.2017.04.008> (2017)
- L. Rhoades and R. Eisenberger, "Perceived organizational support: A Review of the Literature," *Journal of Applied Psychology*, vol. 87, no. 4. pp 698-714, (2002).
- Netemeyer, R. G., et al. "Development and Validation of Work-Family Conflict and Family-Work Conflict Scales." *Journal of Applied Psychology*, 81, 400-410. (1996)
- Perryer, C., et al. "Predicting turnover intentions: The interactive effects of organizational commitment and perceived organizational support." *Management Research Review*, Vol. 33 Iss: 9, pp.911 – 923, (2010).
- Eisenberger, et al. "Perceived organizational support," *Journal of Applied Psychology*, vol. 71, pp. 200–507, (1986).
- R.M. Baron and D.A. Kenny, "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, vol. 51, no. 6, pp. 1173-1182, (1986).
- Rhoades L. et al. "Perceived organizational support: A review of the literature." *Journal of Applied Psychology*; 87:698–714. doi: 10.1037/0021-9010.87.4.698 (2002)
- RupashreeBaral and Shivganesh Bhargava, "Work-family enrichment as a mediator between organizational interventions for work-life balance and job outcomes", *Journal of Managerial Psychology*, Vol. 25 Issue: 3, pp.274-300,(2010).
- Sturges, J., et al. "Working to live or living to work? Work/life balance early in the career." *Human Resource Management Journal*, Vol 14, no 4, pp. 5-20 (2004).
- Suriency, L., et al. "Quality of Work Life and Turnover Intention: A Partial Least Square (PLS) Approach." *Social Indicators Research*, 405–420, (2014).
- Wayne, "Perceived organizational support and leader-member exchange: A social exchange perspective," *Academy of Management Journal*, vol. 40, pp. 82–111, (1997).
- Thomas, L. T., "Impact of family-supportive work variables on work-family conflict and strain: A control perspective." *Journal of Applied Psychology*, 80(1), 6–15. (1995)
- Voydanoff, P.. "Implications of Work and Community Demands and Resources for Work-to-Family Conflict and Facilitation." *Journal of Occupational Health Psychology*, 9(4), 275–285. (2004)
- W.D. Ariani, "Persepsi Terhadap Dukungan Organisasi Dan Penyelia, Kepuasan, Nilai, Dan Komitmen Pada Industri Perbankan Di Indonesia," *Jurnal Keuangan dan Perbankan*, vol. 15, no. 3, pp: 416-427, (2011).

\*\*\*\*\*

# Gamification: Increasing Electronic Word of Mouth in Tourism



**Manju Meenakshy**  
 Research Scholar,  
 Symbiosis International  
 (Deemed University), Pune  
 Email : manch09@gmail.com



**Richa Saxena**  
 Assistant Professor,  
 Anil Surendra Modi School of Commerce  
 NMIMS, Mumbai  
 Email: richa.saxena@nmims.edu



**Dr. Mallika Srivastava**  
 Associate Professor, NMIMS,  
 Bangalore  
 Email: mallikasrivastava123@gmail.com

## A b s t r a c t

This paper attempts to understand the effect of the varied game-related motivational affordances in the online context on consumer intent to write reviews in online tourism sites. The motivational affordances are achievement, enjoyment, pastime, experience gained, ease of use and reciprocal benefit (utility). The results show that the intrinsic motivational affordance of enjoyment had a significant effect on tourist intention to write reviews compared to extrinsic factors like achievement and rewards. The variables enjoyment, reciprocal benefit and pastime showed relationship with intent to write reviews. Game designs for tourism review sites need to focus on the above factors for stimulating desired consumer intent and behaviour.

**Keywords:** Gamification, Motivational Affordances, Word of Mouth, User Generated Media, Tourism Review Sites,

**T**here is a customer shift towards the use of online channels for the purchases of goods and services. According to a report by BCG-Google (2017) 'digital footprint' which is a metric that quantifies consumers with internet access, has doubled for the urban consumers in India during the period 2013 -2016. It is projected to reach 650 million users by 2020. Similarly, 'digital influence', a measure referring to the number of consumers who use internet in their purchase process (irrespective of whether the actual booking is made or not) has grown significantly. It is predicted that 50-55% of the urban customers will be using internet during their purchase process by 2020. The tourism industry is characterised by high involvement, coupled with high levels of experience attributes (where quality cannot be evaluated before the actual service). Tourists depend on online content and reviews during the purchase process to ensure that they book the right service provider. Consumer-generated content is ranked high in terms of trustworthiness and plays a crucial role in travel-related decision making and choices for consumers. A Nielsen study (2015) has placed the trust levels on eWOM to be extremely high being second only to Word of Mouth communication. Sigala, Christou and Gretzel (2012) have confirmed the importance of tourists as marketers for generating content and communication amongst consumers in the tourism sector. They also highlighted that such content is always perceived as more trustworthy, effective, and dependable for the promotion of the tourism experience.

However, such dissemination of experience is highly dependent on the tourists' level of motivation and willingness to share among their fellow tourists (Brabham, 2012). In this context, gamification has emerged as one of the integrated marketing strategies to engage with the customers, increase their level of participation and motivation by giving direction to their behaviour in terms of social interaction or purchase intention (Witt, Scheiner and Robra-Bissant, 2011; Zichermann and Cunningham, 2011). A well thought effective game design and delightful gaming experiences could motivate consumer behaviour (Hamari, Koivisto and Sarsa, 2014; Conejo, 2014; Sigala, 2015). There is literature to support that gamification incorporates game mechanics into non-game settings to increase user engagement and enjoyment of a product or service, and to encourage users to perform certain behaviours (Hsu et al., 2013). According to Intelligence Mordar report 2018, the

growth of gamification market overall is expected to reach 19.39 million USD by 2023. This growth is very well supported by the increased adoption and appreciation in the industry for gamification as an authentic tool for customer engagement and innovative practices. In the Indian context also, revenue from gamification is increasing due to huge penetration of smartphones and other digital devices among different age groups (D'Cunha 2018).

### Definitions

Electronic word of mouth (eWOM) is any positive or negative statement made by potential, actual or former customers about a product or company, which is made available to a multitude of people via the internet (Hennig-Thurau et al., 2004). eWOM can be blogs, social media posts (like the ones on Facebook, Instagram, Twitter etc.) or posts on online review sites (consumer opinion forums).

Gamification refers to the use of game-design elements in non-game contexts. It is a contemporary technique used in diverse settings to engage and foster behavioural change in the target group. It has become an increasingly popular tool for sustaining customer engagement in education, health, media and in crowdsourcing based online communities. Prior research shows that the success of gamification depends on two factors - the area where it is employed and the type of users. Gamification has shown to increase consumer engagement in twelve out of fifteen studies related to the online context (Looyestyn et al. et al., 2017).

Motivational affordances are the properties of certain objects/service, which triggers the consumer's motivational needs and stimulates them in taking the desired actions (Zhang, 2008; Huotari and Hamari, 2017). Gamification has gained prevalence since 2010 and has shown effectiveness in increasing motivation and fostering behaviour change in the areas of health, education, and Business (Xu, Weber and Buhalis, 2014).

This research focusses on such online review sites. Tourists may get motivated to travel by reading blogs or social media posts, but the actual trip-related research is done by gaining information from online review sites like Trip Advisor, Cruise Critic, Travel Talk etc. Hence the scope of the study is limited to online review sites.

The format of the paper is as follows. Section one elaborates on the literature review of gamification related studies.

Section two explains the theoretical framework with the hypothesis, the conceptual model and scales used based on the literature review. Section three comprises of the research design, data analysis and results. Section four includes the discussion, managerial implications, limitations, and future research directions.

## Literature Review

Gamification refers to the use of game-design elements in non-game contexts (Deterding et al., 2011b). It is an umbrella term to denote the application of video game elements to improve user experience and engagement (Deterding et al., 2011b). Dicheva, 2015 has segregated game elements into game design principles and game mechanics. Game design principles include goals/challenges, personalisation, feedback, visible status, unlocking content, social engagement, freedom of choice, freedom to fail, storyline etc. The game mechanisms include Points, badges, levels, leader boards, virtual goods, avatars. It has been observed that many corporates have already started using the concept of gamification to increase the customer engagement, loyalty and brand equity among consumers, which also motivates purchase intention for products and services (Muntean, 2011; Witt, Scheiner and Robra-Bissant, 2011). Gamification, as a concept, has also been used in advertisements and another promotional mix. (Bittner and Schipper, 2014).

Gaming experiences have known to develop psychological outcomes and motivate the consumers for the desired behavioural outcome (Huotari and Hamari, 2017). This desired behaviour results in positive brand assertiveness, purchase & repurchase intention, and customer advocacy (Hofacker et al., 2016). Werbach and Hunter, 2012 also viewed gamification as one of effective business strategy tool designed by trained designers for efficient customer engagement. Seaborn and I. Fels, 2014 considered gamification as an efficient tool better than any existing traditional rewarding strategies of monetary rewards or cash incentives. Authors have also supported the use of gamification to increase sales and purchase intention of consumers (Bittner and Schipper, 2014; Hofacker, 2016; Gatautis, 2016; Farah and Ramadan, 2017). Gamification tools grab the attention of the consumers by having interactive gaming content and engaging the consumers into various cognitive learning. And this cognitive learning

leads to enjoyable gaming experiences for the consumers (Sigala, 2015). Not only a positive experience but a positive and desired customer behaviour in the form of task involvement and performance and positive psychological outcomes like enjoyment (Sigala, 2015; Hamari, Koivisto and Sarsa, 2014). Which leads to significant growth concerning marketing practices and brand recall and positive attitude, increased sales (Cauberghe and Pelsmacker, 2010; Terlutter and Capella, 2013). The concept of gamification has also been used by various mobile application and consumer-oriented companies to encourage consumers to use various e-commerce application, and increase their customer advocacy, brand awareness (Deterding, 2011a; Daniels, 2010). Hanjun Ko (2005) has found that consumers who have high information, convenience, and/or social interaction motivations use Internet and tend to stay at the Web site longer to satisfy their motivations. This may be relevant for tourism sites also. Personalisation of gamification context through linking with Facebook data has shown a higher level of engagement among users of tourism-related sites (Sigala, 2015). Considering all the positive aspects of gamification from the company's perspective, we would now look at factors that could lead to adoption of gamification among the consumers.

## Motivational Affordances

Nick Yee (2006) has identified ten components accounted motivations for playing online games. For Trip Advisor following components can be relevant; Achievement component (in-game symbols of wealth or status), Mechanics (having an interest in rules and processes) and Competition, Social component (interacting with other players), Relationship (with others), Teamwork (obtaining satisfaction from group work), Immersion component (Finding and knowing things that other don't know about), Role-Playing (Creating a persona with a background story and interacting with other players to create an improvised story) and Customisation (having an interest in customising the appearance of their character). Tondello et al. (2016), had created "A gamification user hexad", which shows type of players and their corresponding motivations along with suggested design elements. The first category of the player identified by them is a philanthropist who is motived by purpose. These players do not expect any reward in return. So, the design elements appropriate for them could be

gifting, knowledge sharing or any administrative roles. Another set of players are Socialisers who are said to be motivated by relatedness. Such players wish to develop social connections, so suggested design elements could be social networks, social competition. The third set of players are the free spirits; they would be motivated by getting the freedom to share and express their thoughts, feelings without much control. Hence the elements that would be appropriate for them are exploratory tasks, any creativity tool. Another set of players are achievers, who get motivated by competence. Such players have the passion for succeeding and would be interested in proving themselves. Hence, the elements that would engage with can be challenging tasks, certificate of achievement, learning new skills. Players will also be motivated by some extrinsic rewards. They will be interested in earning some or other reward for their participation. Consequently, the design elements can be rewards, prizes, badges. Apart from all the positive consumers, there might be disruptors also who would be motivated by triggering of changes and would indulge in negative activities by disrupting the system. Mostly they are negative but can be converted into positive by adopting appropriate design elements like innovation platform, anarchic gameplay.

Styvén and Tim Foster (2018) in the context of the tourism industry, had analysed the factors that would influence and motivate the tourists to share their experiences across various social platforms. This study was administered among millennial and generation Z consumers. Adopting from the central tenets of identity theory which is based on symbolic interactionism (Stryker, 1968), authors had

proposed that dispositional characteristics, that is, how the consumer sees himself in relation to peers will influence their decision to share or not to share their experiences. According to social identity theory, an individual can be characterised into different identity having varied roles which can be defined by their collaborative interactions with other (Stryker, 1968; Taylor, Strutton and Thompson, 2012). Hence, this individual is interdependent with social behaviour like eWOM (electronic Word of Mouth). With respect to social media, such behaviour can be defined as their willingness to share their experiences with others (Taylor, Strutton and Thompson, 2012). To increase their self-identity, daily sharing through social media becomes an important part of today's modern lifestyle (Kim, Shawn Jang and Adler, 2015). If the experience is valued as something of great significance to the consumers, they are most likely to engage in eWOM. This would help them self-presentation, and this virtual platform provides them an opportunity to present their self-image (Kim, Shawn Jang and Adler, 2015)

According to Morschheuser et al. (2017), perceived utility from a gaming system is social feedback, in the tourism context, it can be reciprocity from other customers which leads customers to participate in the activity. Kapoor et al. (2018) have indicated that feedback (reciprocity) from others can help in informed decision making.

Based on a focus group discussion with seven review writers, following are some of the motivational affordances documented in literature which have been considered for this study (table 1).

**Table 1: Motivational Affordances**

Serial number	Motivational Affordances	Author and Year	Documented gamifications motivations in literature
1	Enjoyment	Sigala (2015)	Identified Enjoyment, Social interaction and better decision making as values that tourist obtain while using Trip advisor fun ware
		Mäntymäki and Riemer (2014)	Intention to use social gaming sites is greatly driven by the hedonic motives like the fun that the experience internally and not external on external factors

Serial number	Motivational Affordances	Author and Year	Documented gamifications motivations in literature
2	Achievement and Reward	Xu, Weber and Buhalis (2014)	Multi-dimensional motives - curiosity, exploration of destination, socializing, fun and fantasy experience and finally achievement or challenge.
		Tondello et al (2016)	Six different user motivations for gaming which include Philanthropy, autonomy, relatedness, disruption, Achievement and Rewards.
		Yee et al (2012)	A three-factor model explains motivation for gamification which includes Achievement, Social interaction, and Immersion
		Groening and Binnewies (2019)	Achievement improved motivation and persistence
3	Pastime/ Hobby	Hanjun Ko (2005)	Social escapism, Pastime, learning and interactive control
4	Experience Perception/learning	Tussyadiah and Zach (2011)	In tourism context the use of technology was found to help increase the Experience perception
5	Ease of Use	Venkatesh, Morris and Ackerman (2000)	Perceived Ease of Use is a major factor affecting online behavioural intentions of users of technology
		Liu and Li (2011)	Perceived enjoyment, Ease of Use, perceived usefulness has positive effect on mobile gaming
		Rodrigues, Oliveira and Costa (2016)	Ease of use and enjoyment are related to each other and lead to better engagement in e-banking
6	Reciprocal benefit/ reciprocity /response from others (Utility)	Koivisto and Hamari (2014)	Reciprocal benefit was one of the factors related to contribution for Women
		Kapoor et al (2018)	Response from others can be a utility component which helps in making informed decisions
		Morschheuser (2017)	Social feedback can be a perceived benefit for engaging in gamification

### Theoretical Framework:

From the literature review, six motivational affordances related to gamification is hypothesised to have effect on intention to write electronic word of mouth.

H1. The Perceived enjoyment in the activity (ENJ) is positively related to tourist's intent to engage in eWOM (EWM).

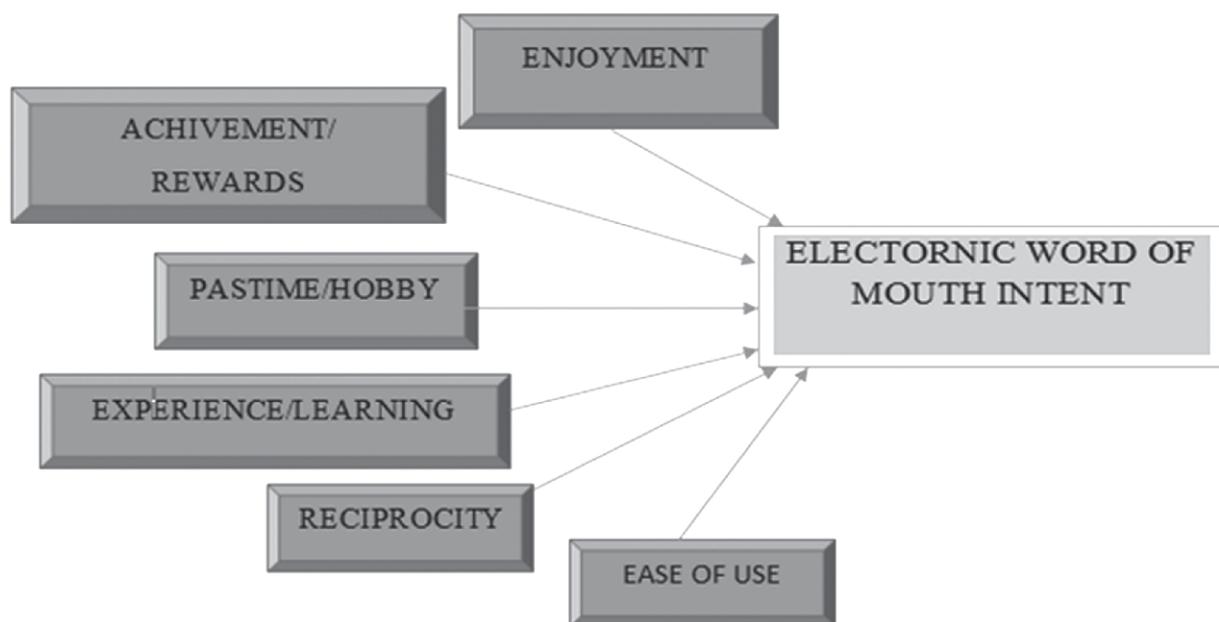
H2. The Feeling of Achievement (ACH) / earning rewards is positively related to tourist's intent to engage in eWOM (EWM)

H3. Recognition that it is pastime / Hobby (HOB) is positively related to tourist's intent to engage in eWOM (EWM)

H4. Experience/learning from the activity (EXP) is positively related to tourist's intent to engage in eWOM (EWM)

H5. Reciprocal Benefit /Reciprocity (RCT) is positively related to tourist's intent to engage in eWOM (EWM)

H6. Ease of Use of platform (EOU) is positively related to tourist's intent to engage in eWOM (EWM)



**Figure 1: Conceptual Model Based on Literature  
(Motivational Affordance Leading to Ewom Intent)**

**Table 2: Scales Adapted for the Study**

Motivational Affordances	Author and Year
ENJOYMENT	Liu and Li (2011), Koivisto and Hamari (2014), Sigala (2015)
EASE OF USE	Liu and Li (2011), Koivisto and Hamari (2014)
ACHIEVEMENT/REWARD	Yee et al (2012), Chang and Wei (2016)
EXPERIENCE /LEARNING	Tussyadiah and Zach (2011)
RECIPROCITY (Reciprocal benefit/utility)	Koivisto and Hamari (2014)
PASTIME/HOBBY	Hanjun Ko (2004)
eWOM	Cheung and Lee (2012)

### Research Design

The research is descriptive in nature which studies the association between the variables selected. The variables are motivating factors related to gamification and intent to engage in electronic work of mouth. The study is based on primary data. Purposive sampling is used to select the respondents. Online questionnaires were administered, and data was collected only from individuals who have booked online and who are aware of online reviews. Data was collected through online means by sending the questionnaire to tourists whose place of origin is Delhi, Maharashtra, Kerala

or West Bengal. As the authors belong to the different areas, it was easy to collect data from different regions. 216 completed questionnaires were received. Out of 216 sample, 80 respondents were from west of India, 61 from south, 48 from north and 27 from east. A final count of 209 usable questionnaires was used for analysis. According to Stevens (2002), the sample size 15 subjects per predictor variable is sufficient for a study using regression. Hence the sample size taken in the study is adequate. Moreover, eWOM and gamification are relatively new areas, and therefore, the sample is justified.

### **Analysis And Results:**

Data were collected through self-reported questionnaires. The respondents who have selected the option as “never heard about online reviews” were eliminated and the final count of 209 was taken for analysis. The data were analyzed using SPSS software. The tools used for analysis are factor analysis and regression.

The pilot run test was done on the first 100 valid respondents and it was found to be reliable upon testing for the internal consistency using Cronbach Alpha.

### **Descriptive Statistics**

Our sample unit majorly consists of young respondents. All 209 responses, who selected that they were aware of online reviews were of age-group 18-30. This was expected, as the digital natives are more inclined towards online experiences. 86 (41.1%) respondents were female and 123 (58.9%) were male. 17.1% of respondents have never posted travel reviews online, and only 2.9% posted travel reviews frequently.

### **Reliability and Validity**

An Exploratory Factor Analysis was conducted on the 29 items to understand the latent constructs and the factor loadings. The Kaiser-Mayer-Olkin value was 0.929, which is considered superb for internal consistency (Field, 2009). Bartlett's test of sphericity  $\chi^2$  (406) = 5008.641 was significant, which means that the correlation between variables was sufficient for factor analysis (Field, 2009). Items passed content validity as they have been taken from valid scales and pretested (Hair, Babin, Black, & Anderson, 2019).

### **Factor Analysis**

Principal Component Analysis was run to extract factors. Six items were further dropped due to cross-loadings. Five components (including the dependent variable) had an eigenvalue greater than 1, showed a 72.416% explanation of the variation in the study. Table 3 shows the mean, standard deviation, and the factor loading of the components after rotation. All Ease of Use items were removed due to low extraction or cross-loadings.

**Table 3 Factor Matrix**

	Mean	S.D.	ACH	eWOM	ENJ	HOB	RCT
ACH2	3.31	1.370	0.794				
ACH3	3.46	1.376	0.738				
ACH1	3.28	1.428	0.736				
ACH5	2.97	1.274	0.691				
ACH4	2.81	1.279	0.632				
eWOM5	2.54	1.304		0.788			
eWOM1	2.40	1.308		0.743			
eWOM4	2.39	1.224		0.621			
eWOM3	2.22	1.129		0.603			
eWOM2	2.86	1.317		0.573			
ENJ2	2.91	1.350			0.746		
ENJ1	2.63	1.242			0.717		
ENJ3	3.13	1.104			0.702		
EXP1	2.90	1.241			0.596		
EXP2	3.00	1.211			0.575		
HOB3	2.44	1.168				0.760	
HOB2	2.27	1.187				0.758	
HOB5	2.75	1.190				0.695	
HOB1	2.99	1.211				0.602	
HOB4	2.98	1.209				0.538	
RCT1	2.76	1.317					0.858
RCT2	2.64	1.290					0.836
$\alpha$			0.906	0.833	0.911	0.884	0.875

As shown in Table 3, all dependent variable items are loaded together forming the construct of eWOM, all achievement items are together under the ACH construct. Three enjoyment items are clubbed with two experience items, which we defined as ENJ variable. All hobby items are loaded together to form the HOB construct and the RCT construct was formed with two RCT items. Further, we used regression to predict the model with three independent

variables RCT, ENJ, ACH, and HOB. The Cronbach alpha values for each construct were at from good to very good acceptance level. Therefore, the constructs are predictive.

#### Regression Results:

Regression was run using the step-wise method, gave the following outcome

**Table 4: Model Summary**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	S.E.	Change Statistics				
					R <sup>2</sup> Change	F Change	df1	df2	Sig. F Change
1	0.715 <sup>a</sup>	0.511	0.509	0.70918	0.511	216.293	1	207	.000
2	0.773 <sup>b</sup>	0.597	0.593	0.64505	0.086	44.202	1	206	.000
3	0.799 <sup>c</sup>	0.639	0.633	0.61247	0.041	23.502	1	205	.000

a. Predictors: (Constant), ENJ

b. Predictors: (Constant), ENJ, RCT

c. Predictors: (Constant), ENJ, RCT, HOB

This table gives the model summary for the set of the independent and dependent variables. In the first model, Model A adjusted R<sup>2</sup> is 0.509 which explains 50.9% variation in dependent variable eWOM is explained by ENJ.

Model B explains a 59.3% variation in eWOM due to ENJ and RCT. Also, Model C gives a 63.3% explanation in eWOM due to ENJ, RCT, and HOB.

**Table 5: analysis Of Variance**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	108.782	1	108.782	216.293	.000 <sup>b</sup>
	Residual	104.108	207	0.503		
	Total	212.890	208			
2	Regression	127.174	2	63.587	152.818	.000 <sup>c</sup>
	Residual	85.716	206	0.416		
	Total	212.890	208			
3	Regression	135.990	3	45.330	120.841	.000 <sup>d</sup>
	Residual	76.900	205	0.375		
	Total	212.890	208			

a. Dependent Variable: eWOM

b. Predictors: (Constant), ENJ

c. Predictors: (Constant), ENJ, RCT

d. Predictors: (Constant), ENJ, RCT, HOB

**Table 6: Coefficients**

The ANOVA table indicates that all models are significant. This implies that there exists a relationship between eWOM and ENJ, RCT and HOB.

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	0.826	0.123	0.715	6.730	.000
	ENJ	0.598	0.041		14.707	.000
2	(Constant)	0.556	0.119	0.430	4.684	.000
	ENJ	0.359	0.051		6.983	.000
	RCT	0.345	0.052		6.648	.000
3	(Constant)	0.325	0.122	0.269	2.655	.009
	ENJ	0.225	0.056		3.998	.000
	RCT	.311	.050		6.261	.000
	HOB	.271	.056		4.848	.000

a. Dependent Variable: eWOM

Regression equations are

$$\text{Model A: } \text{eWOM} = 0.826 + 0.598 \text{ ENJ}$$

$$\text{Model B: } \text{eWOM} = 0.556 + 0.359 \text{ ENJ} + 0.345 \text{ RCT}$$

$$\text{Model C: } \text{eWOM} = 0.325 + 0.225 \text{ ENJ} + 0.311 \text{ RCT} + 0.271 \text{ HOB}$$

Hypothesis H1, H3 and H5 are therefore supported and H2, H4 and H6 are not supported.

### Discussion And Conclusion:

In the context of tourism sites, intrinsic motivational affordances (Enjoyment, reciprocity, and pastime / hobby) showed a greater effect on associated behavioral intention. Extrinsic factors like achievement and rewards did not show enough relation on behavioural intention.

The results confirm with the findings of Mäntymäki and Riemer (2014) and Sigala (2015) about the enjoyment in the activity is a key motivator for consumer behavioural intention. The results, however, contradict the findings of Tussyadiah and Zach (2011) which has found more relevance to extrinsic motivators like rewards and achievement. Possible explanations could be that being review sites, only those who are highly involved in the category choose to write (they find enjoyment in posting). Moreover, tourism products are not experienced on a regular basis, so the concept of reward may not be applicable.

Electronic word of mouth is a medium which is still in its infancy; hence it is worthwhile to look at not only the variables which influence behavioural intention but also at those which are not showing any impact. The deduction can be that achievements/reward related mechanism in review sites are not challenging enough for the customers and hence

did not show the effect on eWOM intent. It could also be inferred that the consumers may not be aware of the various rewards. 'Ease of use' factor showed low extractions and cross-loadings which could be because the review sites mostly follow simple mechanisms for rating and posting comments and the sample for this research consisted of people in the age group of 18-30 years (students and young professionals) who might already be adept with online technologies. A study with older age groups may show more relevance to ease of use. Another insight from the factor analysis shows that enjoyment and experience factors loaded together, a possible experience that online word of mouth generation experience by itself could be an enjoyable activity with respect to reliving holiday memories.

A further point of discussion is that intrinsic motivation has a lasting effect on the behavioural intention rather than extrinsic motivations. A decline in motivation was observed by the second semester after gamification was introduced in an educational context (Furdu et al., 2017). Therefore, game mechanisms that work to enhance intrinsic motivational affordances are most important for any required behavioural change in consumers.

Based on the gamification user hexad (Tondello et al., 2016) and related game mechanisms, to increase the enjoyment in

posting, possible game designs mechanics that could be explored are voting systems, non-linear gameplay and knowledge sharing. Review sites could also use leader boards to acknowledge the star contributors based on the feedback of other customers.

It may be concluded that, since the research shows relationship between intrinsic rewards and intent to engage in eWOM, measures to increase interactivity and enjoyment should be enhanced. Hotels could repost the positive reviews after personally thanking the reviewers, which gives them a feeling that their review is of value. For the negative reviews, hotels could engage in service recovery by apologising and mentioning the steps taken to ensure that corrective action is taken. In the Hotel premises, a digital display unit can have the latest reviews, and similarly, the corrective action taken for negative experiences can be highlighted. This will enhance the credibility of reviews, and the new customers who view the digital display will be prompted to post their experiences. Reviews can be used as marketing content and used in OOH media and digital communications. This will encourage customers to engage in the activity.

### **Managerial Implication**

Gamification in tourism can result in more delightful experience and needs to be added to products in the field (Xu, Buhalis and Weber, 2017) Serious games and the gamification of tourism)Consumers are moving towards digital channel and there is a wave of dis-intermediation which is making it essential for the consumers to search for information about services prior to booking. Managers need to understand the determinant motivators so that gaming systems can be designed in ways to increase the user generated content. Organically fertilizing eWOM will make the review site popular and hotels can also increase their visibility. Customer knowledge management is growing area which can be harnessed through gamification. According to Robson et al (2016), managers should constantly monitor the customers and ensure that there is sustained motivation.

### **Limitation**

The study has taken only a few of the factors associated with game-related motivation.

### **Further Research Directions**

Game design and mechanism are very contextual in nature. The success of the gamification depends on the context and the nature of the user (Hamari et al, 2014). Hence game motivations need to be identified in many contexts related to tourism. This can be intention to purchase, intention to repeat purchase etc. In this study we have only explored one aspect which is intention to engage in online word of mouth. Varied demographic groups could be studied for their intent to engage in eWOM.

### **References**

- BCG-Google. (2017, June). *Demystifying The Indian Online Traveller*. Retrieved from <https://media-publications.bcg.com: https://media-publications.bcg.com/BCG-Google-Demystifying-the-Indian-online-traveler-Jun-2017.pdf>
- Bittner, J., and Schipper, J. (2014)." Motivational effects and age differences of gamification in product advertising. " *Journal of consumer marketing*, 31(5),, pp.391-400.
- Brabham, D. C. (2012). "Managing unexpected publics online: The challenge of targeting specific groups with the wide-reaching tool of the Internet." *International Journal of Communication*, 6, 1139–1158.
- Cauberghe, V., and Pelsmacker, P. (2010). "Advergames.". *Journal of advertising* 39.1, 5-18.
- Cheung, C. M., and Lee, M. (2012)." What drives consumers to spread electronic word of mouth in online consumer-opinion platforms." *Decision support systems*, 53(1), 218-225.
- Conejo, F. (2014). "Loyalty 3.0: how to revolutionize customer and employee engagement with big data and gamification." *Journal of Consumer Marketing*, 31(1), 86–87.
- D'Cunha, S. (2018). "Why the Middle East's Booming Student Population Makes It a Perfect Site for Education Tech Startups." *Forbes*.
- Daniels, M. (2010). "Businesses need to get in the game." *Marketing Week*.
- D'Cunha, S. D. (2018, March 9). "How Digital Gaming In India Is Growing Up Into A Billion-Dollar Market." *Forbes*.

- Deterding, S. e. (2011 b). "Gamification. using game-design elements in non-gaming contexts. "CHI'11 extended abstracts on human factors in computing systems, (pp. 2425-2428.).
- Deterding, S. e. (2011a). "From game design elements to gameness: defining gamification. "Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments.
- Dicheva, D. e. (2015). "Gamification in education: A systematic mapping study ." *Journal of Educational Technology & Society* 18.3 .
- Epstein, Z. (2013). *Enterprise gamification for employee engagement*. Ithaca College .
- Farah, M. F., and Ramadan, Z. (2017). "Disruptions versus more disruptions: How the Amazon dash button is altering consumer buying patterns. *Journal of Retailing and Consumer Services* 39, 54-61.
- Furdu, I. C. (2017). Pros and cons gamification and gaming in classroom.
- Gatautis, R. e. (2016)."Gamification as a mean of driving online consumer behaviour: SOR model perspective." *Engineering Economics* 27.1 , 90-97.
- Groening, C., and Binnewies, C. (n.d.). "Achievement unlocked!-The impact of digital achievements as a gamification element on motivation and performance." *Computers in Human Behavior* 97 (2019), 151-166.
- Hamari, J., et al. (2014). "Does gamification work?--a literature review of empirical studies on gamification." *47th Hawaii international conference on system sciences*. Ieee.
- Hanjun Ko, C.-H. C. (2005). "Internet Uses and Gratifications: A Structural Equation Model of Interactive Advertising." *Journal of Advertising*, 57-70.
- Hennig-Thurau, T. e. (2004). "Electronic word-of-mouth via consumer-opinion platforms: what motivates consumers to articulate themselves on the internet?" *Journal of interactive marketing* 18.1, 38-52.
- Hofacker, C. F. (2016 )." Gamification and mobile marketing effectiveness." *Journal of Interactive Marketing* 34 , 25-36.
- Hsu, S. H. (2013). "Designing attractive gamification features for collaborative storytelling websites." *Cyberpsychology, Behavior, and Social Networking*, 428-435.
- Huotari, K., and Hamari, J. (2017)." A definition for gamification: anchoring gamification in the service marketing literature." *Electronic Markets* 27.1, 21-31.
- Intelligence, M. (2018). *Online gambling market size, share (2018-23). Growth*.
- Kapoor, K. K. (2018). "Advances in social media research: Past, present and future." *Information Systems Frontiers* 20.3, 531-558.
- Kim, D., et al. (2015). "What drives café customers to spread eWOM?" *International Journal of Contemporary Hospitality Management*.
- Koivisto, J., and Hamari, J. (2014)." Demographic differences in perceived benefits from gamification." *Computers in Human Behavior* 35, 179-188.
- Litvin, S. W., et al. (2008). "Electronic word-of-mouth in hospitality and tourism management." *Tourism management*, 29(3), 458-468.
- Liu, Y., and Li, H. (2011). "Exploring the impact of use context on mobile hedonic services adoption: An empirical study on mobile gaming in China." *Computers in Human Behavior* 27.2, 890-898.
- Looyestyn, J. e. (2017). "Does gamification increase engagement with online programs?" A systematic review .*PloS one* 12.3 .
- Mäntymäki, M., and Riemer, K. (2014). "Digital natives in social virtual worlds: A multi-method study of gratifications and social influences in Habbo Hotel." *International Journal of Information Management*, 210-220.
- Morschheuser, B. e. (2017). "How games induce cooperation? A study on the relationship between game features and we-intentions in an augmented reality game." *Computers in human behavior* 77, 169-183.
- Muntean, C. I. (2011). "Raising engagement in e-learning through gamification. " *Proc. 6th international conference on virtual learning ICVL. Vol. 1*.

- Nick Yee, N. D. (2012). Online Gaming Motivations Scale:Development and Validation. *CHI*.
- Robson, K. e. (2016). "Game on: Engaging customers and employees through gamification." *Business horizons* 59.1, 29-36.
- Rodrigues, L. F., et al. (2016). "Does ease-of-use contributes to the perception of enjoyment? A case of gamification in e-banking." *Computers in Human Behavior* 61, 114-126.
- Seaborn, K., and I. Fels, D. (2015)." Gamification in theory and action: A survey." *International Journal of human-computer studies* 74, 14-31.
- Shao, G. (2009). "Understanding the appeal of user-generated media - a uses and gratification perspective." *International Journal of Internet Research*, 7-25.
- Sigala, M. (2015). "The application and impact of gamification funware on trip planning and experiences: The case of TripAdvisor's funware." *Electronic markets* 25.3, 189-209.
- Sigala, M., et al. (2012.). *Social media in travel, tourism and hospitality: Theory, practice and cases*. Ashgate Publishing, Ltd.
- Stryker, S. (1968). "Identity salience and role performance: The relevance of symbolic interaction theory for family research." *Journal of Marriage and the Family*, 558-564.
- Styvén, M. E., and Tim Foster. (2018). "Who am I if you can't see me? The "self" of young travellers as driver of eWOM in social media." *Journal of Tourism Futures*.
- Taylor, D. G., et al.. (2012). "Self-enhancement as a motivation for sharing online advertising." *Journal of Interactive Advertising* 12.2, 13-28.
- Terlutter, R., and Capella, M. (2013). "The gamification of advertising: analysis and research directions of in-game advertising, advergames, and advertising in social network games." *Journal of advertising* 42.2-3, 95-112.
- Tondello, G. F. (2016). "The gamification user types hexad scale." *Proceedings of the 2016 annual symposium on computer-human interaction in play*.
- Tussyadiah, I., and Zach, F. (2011). "The influence of technology on geographic cognition and tourism experience." *ENTER*.
- Venkatesh, V., et al. (2000). "A longitudinal field investigation of gender differences in individual technology adoption decision-making processes." *Organizational behavior and human decision processes* 83.1, 33-60.
- Wei, J.-W. C.-Y. (April 2016). "Exploring Engaging Gamification Mechanics in Massive Online Open Courses." *Journal of Educational Technology & Society*, 177-203.
- Werbach, K., and Hunter, D. (2012). "For the win: How game thinking can revolutionize your business." *Wharton Digital Press*.
- Witt, M., et al. (2011). Gamification of online idea competitions: insights from an explorative case. *GI-Jahrestagung*.
- Xu, F., et al. (2017). "Serious games and the gamification of tourism." *Tourism Management* 60, 244-256.
- Xu, F., et al. (2014). "Gamification in tourism." *Information and communication technologies in tourism 2014, Springer*, 525-537.
- Yee, N. (2006). "Motivations for Play in Online Games." *CYBERPSYCHOLOGY & BEHAVIOR*, 772-776.
- Zhang, P. (2008). Technical opinion Motivational affordances: reasons for ICT design and use. *Communications of the ACM* 51.11 , (pp. 145-147).
- Zichermann, G., and Cunningham., C. (2011). "Gamification by design: Implementing game mechanics in web and mobile apps." *O'Reilly Media, Inc.*
- Zichermann, G., and Linder. , J. (2010). *Game-based marketing: inspire customer loyalty through rewards, challenges, and contests*. John Wiley & Sons.

\*\*\*\*\*

# Human Resource Disclosure Practices: Corporate Sector



**Dr. Anju Verma**  
 Associate Professor,  
 Haryana School of Business  
 Guru Jambheshwar University of  
 Science and Technology, Hisar  
 Email: anjuverma.gju@gmail.com



**Dr. Kirti Aggarwal**  
 Guru Jambheshwar University of  
 Science and Technology, Hisar  
 Email: kirtisingl02@gmail.com

## A b s t r a c t

The paper aims to know the item-wise human resource disclosure practices of selected Indian listed companies. Initially, the Human Resource Disclosure Index (HRDI) of 88 items is constructed for 345 Indian NSE-500 Index listed companies. The data is analyzed using descriptive statistics. The findings of the paper show that the Human Resource Policy and Vision Component has got the highest disclosure percentage (81.50) in the year 2017-18 and lowest disclosure (3.29) relating to Importance of Human Resource to the Organization Component in the year 2015-16. There are numerous practical implications of the present research paper such as managers are directed to indulge in proper management of HR related activities, to find the important HR indicators, and proper present the HR related information. As stakeholders received the key information of HR of a company and better understand the hidden treasure of the company.

**Keywords:** *Human Resource Disclosure, Annual Reports, Content Analysis, Human Resource Disclosure Index.*

**D**ue to globalization, there is an emerging need of better disclosure practices and to improve trust in accounting information system. Through annual reports companies disclose the different types of information. Annual report is a regular corporate disclosure that tells about the progress and future plans of a company. The concept of disclosure is changing over a period of time. Nowadays, company emphasis the qualitative aspects of information which is relevant for the purpose of decision-making. Human Resource (HR) disclosure is a step ahead in this direction. In an accounting era, the concept of corporate disclosure is always getting interest to the researchers throughout the world. But few studies have been conducted on the disclosure practices in India and abroad in various sectors. The existing studies on HR disclosure in developing countries are scarce and these studies deal with specific sector such as the software industry and service exporter companies in India (Murthy & Abeysekera, 2007), the textile sector in Pakistan (Chaudhry & Roomi, 2010) and the information technology and software sector in Australia (Joshi *et al.*, 2010). The majority of the listed companies do not disclose HR information in their corporate annual reports due to lack of mandatory requirements for measurement and reporting of HR (Foong *et al.*, 2003; Stittle, 2004 and Verma & Dewe, 2008).

In past decades, the economy has changed from manufacturing to knowledge based economy. Subsequently, the environment of the business is more complex and more demanding. Existing literature depicted that disclosure of HR is positively associated with performance and value creation of the organization (Edvinsson & Sullivon, 1996; Bontis, 2003 and Anam *et al.*, 2011). Garcia-Ayuso *et al.* (2007) inferred that the expectation of the investors is higher where the companies employed higher quality HR. Skoog (2003) found a positive relationship between long-term profit and HR disclosure. Huang *et al.* (2008) found that institutional investors need the greater amount of information about the company like information about quality of HR employed by firm. But, most of the disclosure is qualitative in nature. So, the institutional investors depend on the additional sources which are very expensive. Hence, HR disclosure helps to institutional investors for better understanding of strength and weaknesses of the company.

In the knowledge based economy, there is increasing the role of knowledge and skills in comparison to traditional

economy in the efficiently management of people and effectively using of other resources (Bontis, 2001). The disclosure of Human Resource (HR) in the annual reports of the organizations is imperative for enhancements of performance of the companies (Seetharaman *et al.*, 2002 and Lengnick-Hall & Lengnick-Hall, 2003). In this way, the disclosure of HR information has emergent research are in accounting field (Curado *et al.*, 2011). The number of research is conducted in different countries related to HR disclosure (Guthrie & Petty, 2000; Abeysekera & Guthrie, 2004 and Abeysekera, 2008) and discover the different implications of HR disclosure in an annual reports of the companies (Edvinsson, 1997; Bozzolan *et al.*, 2003 and Bontis & Serenko, 2009). The study of Bozzolan *et al.* (2003) examined the Intellectual Capital (IC) disclosure practices of Italian companies and they found that industry type and company size are not the important determinants for determining the content of disclosure but they are relevant in explaining the amount of information disclosed by the companies. The another study of Curado *et al.* (2011) demonstrate that how IC impact the market value of the firm.

Human Capital (HC) disclosure received a greater attention from academic and practitioner during the past decade and a half (Stewart, 1994; Bassi *et al.*, 2000 and Abeysekera & Guthrie, 2004). In today's competitive era, the human resources are not only considered the important resource but, they are the key to competitive advantage for the business. Hence, the major portion of the investments to upgrade the HR of the organizations are evident for the businesses who believe HR is the main contributory element for the organization. The existing studies argued that the knowledge and skills of the employees facilitate for improvement the corporate performance (Stewart, 1994; Bontis, 2003 and Bozzolan *et al.*, 2003). Correspondingly, Bontis *et al.* (2001) said that the collective knowledge of an organization is the competitive advantage for the organization over the other organization.

However, traditionally, the HR information is only reported internally not externally by the organizations. Because, there are not any standards for HR disclosure. But, in today's competitive era, the researchers identify the different ways to measure the performance of the company more systematically which involve establishing the common framework for reporting of human resources in a better and systematic manner (Stewart, 1994; Brooking, 1996; Pettrash,

1996 and Low *et al.* 1999). The study of Abeysekera & Guthrie (2004) argues that there is a need to measure and manage the human resources in an efficient manner.

While, there is abundant literature to explore the concept of HR reporting in both developed and developing countries (Subbarao & Zeghal, 1997; Olsson, 2001; Abeysekera & Guthrie, 2004; Ax & Marton, 2008 and Huang *et al.*, 2008). But, the evidence on HR disclosure in Indian country has been rare. So, the present study measures the item-wise disclosure of HR information which helps to the various stakeholders for taking the various decisions.

### **Objective of the Study**

The objective of the present research paper is to know the item-wise human resource disclosure practices of selected Indian listed companies.

### **Research Methodology**

All the companies listed on the National Stock Exchange (NSE-500) formed the population of the present study. The companies other than banking and financial sector, whose annual reports and data on PROWESS database are not available and those follows accounting year are part of the present study. The final sample for present study consists of 345 NSE listed Indian companies: the present paper based

on secondary data. The annual reports of the most recent period from the F.Y. 2012-13 to 2017-18 (six years) are chosen for collecting the data of dependent variable (HRDI). The data of the independent variable is collected from Centre for Monitoring of Indian Economy (CMIE) Prowess database and annual reports of the sample companies.

To measure the item-wise HRDI of selected Indian listed companies, the disclosure index is constructed. It is known as Human Resource Disclosure Index. It is considered as a yardstick to measure the extent of disclosure studies. The content analysis method is widely used in disclosure studies. There are two index for scoring of an item. The first is unweighted index. In this method, a core 1 is assigned if the item is disclosed by the companies and 0 for non-disclosure of an item (Garg, 1992 and Kumar & Garg, 2019). The second index is unweighted index. It is based on subjective judgement and ranks are assigned on the basis of judgement of the researcher. There is not any difference between these two indexes. Generally, the weighted index for scoring of an item is criticized due to subjectivity involved in this index. Hence, the present paper used the unweighted index. The annual reports of most recent period from the F.Y. 2012-13 to 2017-18 are chosen for collecting the data of dependent variable (HRDI).

$$\text{HRDI} = \frac{\text{Total score of individual company}}{\text{Maximum possible score obtainable}} \times 100$$

For analyzing the data, descriptive statistics are used.

### **Data Analysis and Result Discussion**

This section entails the item-wise analysis of the data and results are presented for the same.

The item-wise HRDI of 345 Indian listed companies has examined under the following components:

**Table 1: Detail of Components of HRDI**

<b>Component of Human Resource Disclosure Index</b>	<b>No. of Items</b>
Human Resource Policy and Vision	12
General Information about Human Resource	12
Financial Information relating to Human Resource	15
Importance of Human Resource to the Organization	12
Human Resource Development	10
Employee's Health and Safety	6
Human Resource Relationship and Culture	11
Different Benefits/Assistance given to Employees	6
Employee's Engagement and Empowerment	4
<b>Human Resource Disclosure Index</b>	<b>88</b>

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

The following components mentioned above have been discussed hereunder:

**Table 2: Item-wise Disclosure of Human Resource Policy and Vision Component**

S. No.	Disclosure of Human Resource Policy and Vision	Time Period (in years)						Trend
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Policy of recruitment and selection	32.46	33.91	44.06	57.39	69.57	73.04	Continuously Increasing
2.	Equal opportunity policy and non-discrimination	39.42	42.90	51.59	60.87	82.03	91.01	Continuously Increasing
3.	Policy towards woman empowerment	6.38	6.38	6.67	7.25	14.78	24.06	Increasing
4.	Policy of training	70.43	72.75	78.84	89.28	90.72	92.17	Continuously Increasing
5.	Policy regarding child labour/forced labour	35.36	36.23	39.42	42.32	49.28	60.87	Continuously Increasing
6.	Policy for combating sexual harassment	78.26	79.13	85.22	91.88	95.94	96.52	Continuously Increasing
7.	Whistle blower policy/vigil mechanism	77.39	79.13	88.70	96.52	97.68	99.71	Continuously Increasing
8.	Policy of remuneration for directors, key managerial persons and other employees	73.04	77.68	87.54	95.07	97.10	97.39	Continuously Increasing
9.	Employee retention policy	61.16	63.77	70.14	73.62	74.49	76.23	Continuously Increasing
10.	Policy of reward	63.48	68.12	77.97	84.35	87.54	87.25	Fluctuating
11.	Policy of bonus scheme	51.59	65.22	78.26	84.06	84.06	85.22	Increasing
12.	Compliance with employment and labour laws etc.	55.94	81.74	89.28	92.46	93.91	94.49	Continuously Increasing
<b>Overall Trend (Mean)</b>		53.74	58.91	66.47	72.92	78.09	81.50	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 2 depicts the item-wise disclosure of Human Resource Policy and Vision Component of sample companies for the period under reference. All the items of Human Resource Policy and Vision Component show a continuous increasing trend of disclosure percentages from the year 2012-13 to 2017-18 except Policy towards woman empowerment, Policy of reward and Policy of bonus scheme. Policy towards woman empowerment exhibits constant disclosure percentage in the years 2012-13 and 2013-14 and afterwards it showing continuous increasing trend. Policy of reward records increasing trend of disclosure percentages from the year 2012-13 to 2016-17 and in the year 2017-18, it is slightly decreased from 97.54 to 87.25. Policy of bonus scheme exhibit increasing trend of disclosure percentages from the year 2012-2013 to 2015-2016 and in the year 2016-17, the disclosure percentage is similar to previous disclosure percentage (84.06) and afterwards, it is increased (85.22). The overall trend of the sample years is also on continuous increasing trend as the values are increasing from the year 2012-13 to 2017-18 (53.74 per cent to 81.50 per cent).

Results further demonstrate that Whistle blower policy/vigil mechanism item has got high disclosure percentages in the years 2017-18 (99.71) and 2016-17 (97.68) followed by Policy of remuneration for directors, key managerial persons and other employees in the year 2017-18 (97.39) and 2016-17 (97.10). Policy towards woman empowerment during the sample period has got lowest disclosure percentages such as 2012-13 (6.38), 2013-14 (6.38), 2014-15 (6.67), 2015-16 (7.25), 2016-17 (14.78) and 2017-18 (24.06). This low amount of disclosure percentages indicates that organizations are giving less importance to women empowerment.

The above discussion concludes that the sample companies provide a good amount of disclosure of Human Resource Policy and Vision Component. On an average, the disclosure of sample companies in the year 2017-18 (81.50 per cent) related to Human Resource Policy and Vision Component in their respective annual reports.

**Table 3: Item-wise Disclosure of General Information about Human Resource Component**

S. No.	Disclosure of General Information about Human Resource	Time Period (in years)						Trend
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	General and vocational education/qualification	29.28	29.28	29.28	29.28	29.28	29.57	Increasing
2.	Work-related knowledge and experience	75.36	75.65	76.23	76.52	77.68	77.97	Continuously Increasing
3.	Education Index	0.29	0.29	0.29	0.29	0.58	0.58	Increasing
4.	Diversity of employees	26.09	26.67	27.25	27.25	26.96	28.70	Fluctuating
5.	Total number of employees	69.28	73.62	75.94	76.23	78.55	82.61	Continuously Increasing
6.	Geographical distribution of employees	2.61	2.61	2.61	2.90	3.19	3.77	Increasing
7.	Category of employees	6.67	6.96	7.25	7.83	9.28	14.49	Continuously Increasing
8.	Average age of employees	4.35	4.64	4.35	4.35	4.64	5.51	Fluctuating
9.	Total no. of woman employees	14.49	16.52	18.26	19.42	23.19	26.38	Continuously Increasing
10.	Total no. of employees with disabilities	22.90	28.12	35.07	40.29	46.38	55.36	Continuously Increasing
11.	Total number or rate of employee turnover	6.96	7.25	7.83	8.12	8.70	8.99	Continuously Increasing
12.	Employee induction and familiarization programme	14.78	18.26	23.77	26.96	28.41	30.72	Continuously Increasing
<b>Overall Trend (Mean)</b>		22.75	24.15	25.68	26.62	28.07	30.39	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 3 depicts the item-wise disclosure of General Information about Human Resource Component of sample companies for the period under reference. All the items of General Information about Human Resource Component exhibits continuous increasing trend from the year 2012-13 to 2017-18 except General and vocational education/qualification, Education Index, Diversity of employees, Geographical distribution of employees and Average age of employees. General and vocational education/qualification show constant disclosure percentages from the year 2012-13 to 2016-17 and afterwards, it has increased slightly. Education Index has constant disclosure percentages from the year 2012-13 to 2015-16 (0.29) and afterwards, it is also constant but increased disclosure percentage (0.58). The disclosure percentages of Diversity of employees record increasing trend in the first two years than in next two years show (constant trend) and afterwards, it has increased. Geographical distribution of employees shows constant disclosure percentages from the year 2012-13 to 2014-15 and afterwards, in exhibits increasing trend. Average age of employees portrays fluctuating trend of disclosure percentages. There is continuous increasing trend of overall

mean across the sample period (22.75 per cent to 30.39 per cent).

Results further demonstrate that a total number of employees item has got highest disclosure percentages in the year 2017-18 (82.61) and 2016-17 (78.55) followed by Work-related knowledge and experience in the year 2017-18 (77.97), 2016-17 (77.68) and in the year 2015-16 (76.52). The Education Index item during the sample period has got lowest disclosure percentages such as 2012-2013 (0.29), 2013-14 (0.29), 2014-15 (0.29), 2015-16 (0.29), 2016-17 (0.58) and 2017-18 (0.58). This low amount of disclosure percentages indicate that companies seem least active towards the disclosure of Education Index of the employees.

The above discussion concludes that the sample companies provide less amount of information relating to General Information about Human Resource Component. On an average, the disclosure of sample companies in the year 2017-18 (30.39 per cent) related to General Information about Human Resource Component in their respective annual reports.

**Table 4: Item-wise Disclosure of Financial Information relating to Human Resource Component**

S. No.	Disclosure of Financial Information relating to Human Resource	Time Period (in years)						Trend
		-	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Amount spent on recruitment and selection	10.14	10.14	10.43	11.01	10.43	11.30	Fluctuating
2.	Amount spent in training	12.46	12.46	13.33	13.33	13.62	14.20	Increasing
3.	Cost of safety measures	2.32	2.32	2.32	2.32	2.32	3.48	Increasing
4.	Profit sharing and Employee Share Option Plans (ESOPs) or employee purchase share schemes	81.16	86.09	91.30	97.10	98.84	98.84	Increasing
5.	Loans and advances to HR	66.09	68.12	69.86	71.88	73.04	75.65	Continuously Increasing
6.	Sales/turnover per employee	1.16	1.16	1.16	1.16	2.03	2.03	Increasing
7.	Workers and staff welfare expenses	64.93	73.04	87.83	97.68	98.55	98.84	Continuously Increasing
8.	Employee cost/employee benefits expense as a % of revenue from operations	6.09	6.96	7.25	8.41	8.99	8.70	Fluctuating
9.	Employee welfare fund	9.57	10.43	11.88	12.17	12.75	15.36	Continuously Increasing
10.	Employees/workers compensation fund	0.58	0.29	0.29	0.29	0.29	0.58	Fluctuating
11.	Compensated absences and leave encashment	85.22	89.86	94.20	97.39	97.39	97.39	Increasing
12.	Termination benefits	33.33	35.36	37.39	38.84	43.48	48.99	Continuously Increasing
13.	Provision for or contribution to employee or worker retirement benefit like pension provision, provident fund, superannuation fund, gratuity fund etc.	84.64	91.88	98.26	99.71	100.00	100.00	Increasing
14.	Redundancy and retrenchment information	1.45	2.03	2.61	3.19	4.06	6.67	Continuously Increasing
15.	Medical benefits	48.99	53.33	56.23	56.23	59.42	59.71	Increasing
<b>Overall Trend (Mean)</b>		33.87	36.23	38.96	40.71	41.68	42.78	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage

Table 4 depicts the item-wise disclosure of Financial Information relating to Human Resource Component of sample companies for the period under reference. Five items (Loans and advances to HR, Workers and staff welfare expenses, Employee welfare fund, Termination benefits, and Redundancy and retrenchment information) of Financial Information relating to Human Resource Component show continuous increasing trend of disclosure percentages from the year 2012-13 to 2017-18. Amount spent in training, Cost of safety measures, Profit sharing and Employee Share Option Plans (ESOPs) or employee purchase share schemes, Sales/turnover per employee, Compensated absences and leave encashment, Provision for or contribution to employee or worker retirement benefit like pension provision, provident fund, superannuation fund, gratuity fund etc. and Medical benefits items portrays increasing trend of disclosure percentages. Amount spent on recruitment and selection, Employee cost/employee benefits expense as a % of revenue from operations and

Employees/workers compensation fund items records fluctuating trend of disclosure percentages. The overall trend of mean on a continuous increasing side crosswise the reference period (33.87 per cent to 42.78 per cent).

Results further demonstrate that Provision for or contribution to employee or worker retirement benefit like pension provision, provident fund, superannuation fund, gratuity fund etc. item has got high disclosure percentages for the years 2016-17 and 2017-18 (100) and 2015-16 (99.71) followed by Profit sharing and Employee Share Option Plans (ESOPs) or employee purchase share schemes item in last two years (98.84), Workers and staff welfare expenses item in 2017-18 (98.84). Employees/workers compensation fund item has got lowest disclosure percentages for the years 2013-14 to 2016-17 (0.29), 2012-13 and 2017-18 (0.58) followed by Sales/turnover per employee from the year 2012-13 to 2015-16 (1.16) and Redundancy and retrenchment information item in the year 2012-13 (1.45).

The above discussion concludes that, organizations given lesser importance to disclosure of Financial Information relating to Human Resource Component. On an average, the

disclosure of sample companies in the year 2017-18 (42.78 per cent) related to Financial Information relating to Human Resource Component in their respective annual reports.

**Table 5: Item-wise Disclosure relating to Importance of Human Resource to the Organization Component**

S. No.	Disclosure relating to Importance of Human Resource to the Organization	Time Period (in years)						Trend
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Recognizing human resource an important resource of an organization	23.19	28.12	31.88	32.75	32.17	31.59	Fluctuating
2.	Total amount of employee value added in value added statement	1.74	1.74	2.32	2.32	2.32	2.32	Increasing
3.	Value added per employee	1.16	1.45	1.45	1.45	0.87	0.87	Fluctuating
4.	Human resource valuation	0.29	0.29	0.29	0.29	0.29	0.29	Constant
5.	Separate HRA Statement showing total value of human resource	0.29	0.29	0.29	0.29	0.29	0.29	Constant
6.	Valuation model used	0.29	0.29	0.29	0.29	0.29	0.29	Constant
7.	Discount rate applied	0.29	0.29	0.29	0.29	0.29	0.29	Constant
8.	Age-wise distribution of employees	0.29	0.29	0.29	0.29	0.29	0.29	Constant
9.	Employee cost/HR value (%)	0.00	0.00	0.29	0.29	0.29	0.29	Increasing
10.	HRV to Total Resources	0.29	0.29	0.29	0.29	0.29	0.29	Constant
11.	PBT to Human Resource Value	0.00	0.29	0.29	0.29	0.29	0.29	Increasing
12.	Establishing and promoting the corporation's employee brand	0.58	0.58	0.58	0.58	0.87	0.87	Increasing
<b>Overall Trend (Mean)</b>		2.37	2.83	3.21	3.29	3.21	3.16	Fluctuating

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 5 depicts the item-wise disclosure relating to the Importance of Human Resource to the Organization Component of sample companies for the period under reference. Out of twelve items eight items (Human resource valuation, Separate HRA Statement showing total value of human resource, Valuation model used, Discount rate applied, Age wise distribution of employees and HRV to Total Resources) portrays constant disclosure percentage in all the years (0.29) and have very low disclosure. It means organization do not consider the human resource accounting as a valuable tool for the success of an organization. Recognizing human resource an important resource of an organization item has increasing trend of disclosure percentage in first four years (23.19, 28.12, 31.88 and 32.17 respectively), afterwards, it shows decreasing trend. Total amount of employee value added in value added statement item has constant disclosure percentages from the year 2012-13 to 2013-14 (1.74) and after that in last four years it has also constant disclosure percentages but increased in comparison to previous disclosure percentage (2.32). The disclosure percentage of Value added per employee item in the year 2012-13 (0.16) than from the year 2013-14 to 2015-16 (1.45) and in last two years 2016-17 and 2017-18 (0.87).

Employee cost/HR value (%) has zero disclosure percentages in first two years and afterwards, it has increased but constant disclosure percentages in last four years. PBT to Human Resource Value has zero disclosure percentages in 2012-13 and after that increased but constant disclosure percentage in last five years. Establishing and promoting the corporation's employee brand item records constant disclosure percentages in first four years (0.58) and also in last two years 2016-17 and 2017-18 (0.87) disclosure percentages. The overall trend of this component on year-wise is fluctuating.

Results further demonstrate that Recognizing human resource an important resource of an organization item has got high disclosure percentages in the year 2015-16 (32.75), 2016-17 (32.17), 2014-15 (31.88) and in the year 2017-18 (31.59). Employee cost/HR value (%) has got minimum disclosure percentages for the years 2012-13 to 2013-14 (0.00) and PBT to Human Resource Value in the year 2012-13 (0.00).

The above discussion concludes that the sample companies provide a lesser amount of disclosure relating to Importance of Human Resource to the Organization Component. On an

average, the disclosure of sample companies in the year 2015-16 (3.29 per cent) related to Importance of Human Resource to the Organization Component in their respective

annual reports. It indicates that companies giving very less importance to accounting of human resource in an organization.

**Table 6: Item-wise Disclosure of Human Resource Development Component**

S. No.	<b>Disclosure of Human Resource Development</b>	Time Period (in years)						<b>Trend</b>
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Employees career growth/development and planning	33.33	33.91	34.20	34.78	35.94	37.97	Continuously Increasing
2.	Management succession plan	44.35	45.22	46.09	47.25	49.28	50.43	Continuously Increasing
3.	Training and development programmes for existing/new employees	66.38	75.07	83.19	88.41	90.43	91.59	Continuously Increasing
4.	Percentage of employee (category-wise) given safety or skill up-gradation training	30.43	37.10	43.19	48.70	54.20	60.00	Continuously Increasing
5.	Training to employees through in-house programme	20.87	22.03	23.77	24.64	24.06	29.86	Fluctuating
6.	Establishment of trainee centres	9.57	10.72	11.30	11.59	12.75	15.65	Continuously Increasing
7.	Job rotation opportunities	6.96	7.54	8.70	8.70	10.43	15.07	Increasing
8.	Performance recognition	76.52	79.71	82.90	84.64	86.67	86.96	Continuously Increasing
9.	HR awards/rewards for good performance	73.62	77.10	81.45	83.19	86.09	85.80	Fluctuating
10.	Entrepreneurial spirit and innovativeness	67.83	76.81	84.35	87.54	87.25	89.86	Fluctuating
<b>Overall Trend (Mean)</b>		42.99	46.52	49.91	51.94	53.71	56.32	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 6 depicts the item-wise disclosure of Human Resource Development Component of sample companies for the period under reference. All the items of Human Resource Development Component have continuous increasing trend of disclosure percentages from the year 2012-13 to 2017-18 except Training to employees through in-house programme, Job rotation opportunities, HR awards/rewards for good performance and Entrepreneurial spirit and innovativeness. Training to employees through in-house programme show increasing trend for the years 2012-13 to 2015-16 but a slight decrease in the year 2016-17 and again increase in the year 2017-2018. A Job rotation opportunity item records increasing trend in first three years. In the year 2015-16 it has same as 2014-15 and thereafter, it is increased. HR awards/rewards for good performance item has increasing trend from the year 2012-13 to 2016-17 but a slight decrease in the year 2017-18. Entrepreneurial spirit and innovativeness item is also increasing trend on year on year basis but a slight decrease

in the year 2016-17. The overall trend of mean is on a continuous uptrend basis across the reference period (42.99 per cent to 56.32 per cent).

Results further demonstrate that Training and development programmes for existing/new employees item has got high disclosure percentages in the year 2017-18 (91.59) and 2016-17 (90.43) and Entrepreneurial spirit and innovativeness item in the year 2017-18 (89.86). Job rotation opportunities has got lowest disclosure percentages in the year 2012-13 (6.96), 2013-14 (7.54), 2014-15 (8.70) and 2015-16 (8.70) followed by Establishment of trainee centres in the year 2012-13 (9.57).

The above discussion concludes that the sample companies provide the good amount of disclosure of Human Resource Development Component. On an average, the disclosure of sample companies in the year 2017-18 (56.32 per cent) related to Human Resource Development Component in their respective annual reports.

**Table 7: Item-wise Disclosure of Employee's Health and Safety Component**

S. No.	Disclosure of Employee's Health and Safety	Time Period (in years)						Trend
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Promoting employee Health and safety practices at work place	78.55	80.87	83.77	85.51	87.54	89.28	Continuously Increasing
2.	Information to employees about training regarding health and safety issues	45.22	49.28	52.17	55.07	60.87	65.51	Continuously Increasing
3.	Providing a low cost health care for employees	17.68	19.13	20.29	21.16	22.03	24.93	Continuously Increasing
4.	Establishing a safety department/committee	10.43	11.01	12.17	12.17	12.17	13.33	Increasing
5.	Compliance with health and safety standards and regulations	39.13	44.64	48.70	49.28	50.43	53.62	Continuously Increasing
6.	Receiving a safety award	13.62	16.52	17.97	18.84	20.00	24.93	Continuously Increasing
<b>Overall Trend (Mean)</b>		34.11	36.91	39.18	40.34	42.17	45.27	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 7 depicts the item-wise disclosure of Employee's Health and Safety Component of sample companies for the period under reference. All the items of Employee's Health and Safety Component have continuous increasing trend of disclosure percentages for the years 2012-13 to 2017-18 except Establishing a safety department/committee. Establishing a safety department/committee item show increasing trend of disclosure percentages from the year 2012-13 to 2014-15 but in the year 2015-16 and 2016-17 the disclosure percentages is same as in the 2014-2015 and in the year 2017-2018 it has increased. The overall trend of the mean percentage is continuously rising on year on year basis (34.11 to 45.27).

Results further demonstrate that Promoting employee Health and safety practices at work place item has got high

disclosure percentages in the year 2017-18 (89.28), 2016-17 (87.54), 2015-16 (85.51), 2014-15 (83.77), 2013-14 (80.87) and in the year 2012-13 (78.55). Establishing a safety department/committee has got lowest disclosure percentages in all the sample period such as 2012-13 (10.43), 2013-14 (11.01), 2014-15 (12.17), 2015-16 (12.17), 2016-17 (12.17) and 2017-18 (13.33).

The above discussion concludes that the sample companies provide a good amount of disclosure of Employee's Health and Safety Component. On an average, the disclosure of sample companies in the year 2017-18 (45.27 per cent) related to Employee's Health and Safety Component in their respective annual reports.

**Table 8: Item-wise Disclosure of Human Resource Relationship and Culture Component**

S. No.	Disclosure of Human Resource Relationship and Culture	Time Period (in years)						Trend
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Fair work practices	64.35	65.80	67.25	67.83	68.12	69.86	Continuously Increasing
2.	Respect and promotes human rights	43.77	44.06	44.64	45.80	51.01	57.97	Continuously Increasing
3.	Employee motivation	63.19	63.77	64.35	67.25	68.12	69.28	Continuously Increasing
4.	Management-employee relationship	64.06	64.93	65.51	68.99	70.43	71.88	Continuously Increasing
5.	Employee thanks/appreciation	85.51	90.14	93.04	97.10	97.10	97.97	Increasing
6.	Union activity/workers' unions/association	42.90	44.64	48.99	52.75	57.10	62.61	Continuously Increasing
7.	Collective Bargaining Agreements/ Enterprise Bargaining	6.67	7.83	8.12	8.70	10.43	12.75	Continuously Increasing
8.	No. of cases filed or pending of child labour/forced labour	31.30	33.33	36.81	38.84	47.54	56.52	Continuously Increasing
9.	No. of cases filed or pending of Sexual Harassment	68.41	78.84	86.96	91.30	92.75	94.20	Continuously Increasing
10.	Punishment to employee	1.74	1.74	2.03	2.32	2.90	6.96	Increasing
11.	Employee involvement in the community	11.88	13.91	15.36	17.39	19.13	20.29	Continuously Increasing
<b>Overall Trend (Mean)</b>		43.98	46.27	48.46	50.75	53.15	56.39	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 8 depicts the item-wise disclosure of Human Resource Relationship and Culture Component of sample companies for the period under reference. All the items of disclosure of Human Resource Relationship and Culture Component portrays continuous increasing trend of disclosure percentages for the years 2012-13 to 2017-18 except Employee thanks/appreciation and Punishment to employee. Employee thanks/appreciation show increasing trend of disclosure percentages from the year 2012-13 to 2015-16. In the year 2016-17 the disclosure percentage is the same as previous disclosure percentage and in the year 2017-18 it has increased. Punishment to employee records constant disclosure percentage from the year 2012-13 to 2013-14 (1.74) and afterwards, it has an increasing trend. The overall trend of the mean represents a continuous rise on year on year basis (43.98 per cent to 56.39 per cent).

Results further demonstrate that Employee thanks/appreciation item has got high disclosure percentages in the year 2017-18 (97.97), 2016-17 (97.10), 2015-16 (97.10), 2014-15 (93.04), 2013-14 (90.14) and 2012-13 (85.51). So, it can be concluding that organization has given more consideration regarding Employee thanks/appreciation. Punishment to employee item has got lowest disclosure percentages in the years 2012-13 and 2013-14 (1.74 each), 2014-15 (2.03), 2015-16 (2.32), 2016-17 (2.90) and 2017-18 (6.96).

The above discussion concludes that the sample companies provide the good amount of disclosure of Human Resource Relationship and Culture Component. On average, the disclosure of sample companies in the year 2017-18 (56.39 per cent) related to Human Resource Relationship and Culture Component in their respective annual reports.

**Table 9: Item-wise Disclosure of Different Benefits/Assistance given to Employees Component**

S. No.	Disclosure of Different Benefits/Assistance given to Employees	Time Period (in years)						Trend
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Staff accommodation	35.94	38.55	39.71	40.87	41.16	41.45	Continuously Increasing
2.	Employee recreation and entertainment relating to cultural function, annual picnic/travelling, sports activities, etc.	11.30	12.17	12.75	12.75	14.20	14.49	Increasing
3.	Subsidised canteen	1.16	1.16	1.16	1.16	1.74	2.90	Increasing
4.	Subsidised transport	1.45	1.74	1.74	2.03	2.90	3.77	Increasing
5.	Information about support for day care, maternity and paternity leave	16.52	17.97	17.97	17.97	19.71	20.00	Increasing
6.	Holiday benefits	3.77	4.06	4.06	4.35	4.93	6.09	Increasing
<b>Overall Trend (Mean)</b>		11.69	12.61	12.90	13.19	14.11	14.78	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 9 depicts the item-wise disclosure of Different Benefits/Assistance given to Employees Component of sample companies for the period under reference. Only one item such as Staff accommodation show continuous increasing trend of disclosure percentage from the year 2012-13 to 2017-18. Employee recreation and entertainment relating to cultural function, annual picnic/travelling, sports activities, etc. records increasing trend of disclosure percentages form the year 2012-13 to 2014-15. In the year 2015-16 it has constant and same as the previous one and afterwards, it has increased. Subsidised canteen portrays constant disclosure percentage from the year 2012-13 to 2015-16 and afterwards, it has increased.

The disclosure percentages of Subsidised transport item in the year 2012-13 (1.45). In the year 2013-14 and 2014-15, it has constant disclosure percentages (1.74 each) and in the last three years it has increased. The disclosure percentages of Information about support for day care, maternity and paternity leave item in the year 2012-13 is 16.52. From the year 2013-14 to 2015-16, it shows constant disclosure percentage (17.97 each). And in the last two years it has increased. The disclosure percentages of Holiday benefit in the year 2012-13 has 3.77. In 2013-14 to 2014-15, it records constant disclosure percentages (4.06) afterwards, it has increased. The overall trend of mean percentage exhibits continuous rise under the reference period (11.69 to 14.78).

Results further demonstrate that Staff accommodation item has got high disclosure percentages in the year 2017-18 (41.45), 2016-17 (41.16), 2015-16 (40.87), 2014-15 (39.71), 2013-14 (38.55) and in the year 2012-13 (35.94). Subsidised canteen show got lowest disclosure percentages such as 2012-13 (1.16), 2013-14 (1.16), 2014-15 (1.16), 2015-16 (1.16) followed by Subsidised transport item in the year 2012-13 (1.45), 2013-14 and 2014-15 (1.74 each).

The above discussion concludes that the sample companies provide the low amount of disclosure of Different Benefits/Assistance given to Employees Component. On an average, the disclosure of sample companies in the year 2017-18 (14.78 per cent) related to Different Benefits/Assistance given to Employees Component in their respective annual reports.

**Table 10: Item-wise Disclosure of Employee's Engagement and Empowerment Component**

S. No.	Disclosure of Employee's Engagement and Empowerment	Time Period (in years)						Trend
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
1.	Employee engagement practices	39.42	46.96	50.14	51.88	59.42	63.48	Continuously Increasing
2.	Employee engagement/satisfaction survey	14.49	15.94	16.81	18.26	21.16	25.51	Continuously Increasing
3.	Employee empowerment	15.65	20.00	21.16	21.45	24.06	28.12	Continuously Increasing
4.	Feedback from employees	14.49	18.26	22.03	23.19	26.09	32.46	Continuously Increasing
<b>Overall Trend (Mean)</b>		21.01	25.29	27.54	28.70	32.68	37.39	Continuously Increasing

Source: Annual reports of sample companies from F.Y. 2012-13 to 2017-18.

Note: The values of HRDI are measured in percentage.

Table 10 depicts the item-wise disclosure of Employee's Engagement and Empowerment Component of sample companies for the period under reference. All the items of Employee's Engagement and Empowerment Component portrays continuous increasing trend of disclosure percentage from the year 2012-13 to 2017-18. The overall trend of mean percentage portrays on a continuous increasing side on year on year basis (21.01 to 37.39).

Results further demonstrate that Employee engagement practices item has got high disclosure percentages in the year 2017-18 (63.48), 2016-17 (59.42), 2015-16 (51.88), 2014-15 (50.14), 2013-14 (46.96) and 2012-13 (39.42). So, it can be concluding that organization has given more consideration regarding engagement of employees in various activities. Employee engagement/satisfaction survey item and Feedback from employees item records got lowest disclosure percentage in the year 2012-13 (14.49) followed by Employee empowerment item in the year 2012-13 (15.65), Employee engagement/ satisfaction survey item in the year 2013-14 (15.94) and again Employee engagement/satisfaction survey item in the year 2014-15 (16.81). It indicates that organization has not given so much consideration regarding Employee engagement/satisfaction survey item and Feedback from employees. It is very dangerous for the success of the organization because employees are the key to growth of the organization.

The above discussion concludes that the sample companies provides low amount of disclosure of Employee's Engagement and Empowerment Component. On an average, the disclosure of sample companies in the year 2017-18 (37.39 per cent) related to Employee's Engagement and Empowerment Component in their respective annual reports.

### Conclusion

On an average, Human Resource Policy and Vision Component have got highest disclosure percentage in the year 2017-18 (81.50) and lowest disclosure relating to Importance of Human Resource to the Organization Component in the year 2015-16 (3.29). It means organization given more importance to HR policy and vision. It serves as a reference point for the decisions that are made related to workforce of an organization. The least active regarding importance of HR to the organization. It indicates that organization do not consider HR as a key factor for success of the organization. The low disclosure related to this component may be due to conservative approach of companies towards HR, less qualified management personnel who do not recognize the importance of HR in the organization and low investment on HR development. Overall, the HR disclosure practices of selected Indian listed companies are fairly good. But, a huge scope for disclosure of HR related information is still prevailing in the corporate sector in India.

## Managerial Implications

The paper has numerous managerial implications. *Firstly*, the companies receive numerous benefits by proper dissemination of HR information to the various stakeholders of a company such as employees, investors and shareholders etc. Managers are directed to indulge in proper management of HR related activities, to find the important HR indicators and proper present the HR related information. As stakeholders, received the key information of HR of a company and better understand the hidden treasure of the company. *Secondly*, when the organization is complex, the positive effect of HR disclosure is reduced. So, the managers of a company are advised to apply the cost effective measures for dissemination of HR related information.

## Limitations and Future Research Directions

The present paper has several limitations. *Firstly*, the present paper was limited to a sample size of 345 NSE listed companies excluding banking and financial sectors. The future studies may be enhanced by including banking and financial sectors. *Secondly*, in the content analysis method, there may be various issues associated with the level of subjectivity involved in the coding process. *Thirdly*, the companies listed on National Stock Exchange are part of the study. Actually, there are some unlisted companies which report the HR information, but these companies have been omitted from the present paper. The future studies may be including these companies. *Fourth*, the present paper considers the time period of six years. But, the findings are change over the passage of time. Hence, the future studies included the time period of ten to fifteen years that may provide a complete picture of HR disclosure. *Fifth*, the present paper considers the annual reports of the companies are only source of the HR disclosure. The future studies may be including the other disclosure means such as brochures, print and broadcast media and newsletters.

## References

- Abeysekara, I. and Guthrie, J. (2004), "Human capital reporting in a developing nation", *The British Accounting Review*, Vol. 36, No. 3, pp. 251-268.
- Abeysekera, I. and Guthrie, J. (2004), "Human capital reporting in a developing nation", *The British Accounting Review*, Vol. 36, pp. 251-268.
- Abeysekera, I.K. (2008), "Intellectual capital disclosure trends: Singapore and Sri Lanka", *Journal of Intellectual Capital*, Vol. 9, No. 4, pp. 723-737.
- Absar, M.M.N., et al. (2014), "Human capital reporting: Evidences from the banking sector of Bangladesh", *International Journal of Learning and Intellectual Capital*, Vol. 11, No. 3, pp. 244-258.
- Alam, I. and Deb, S.K. (2010), "Human Resource Accounting Disclosure (HRAD) in Bangladesh: Multifactor regression analysis - A decisive tool of quality assessment", *The Cost and Management*, Vol. 38, No. 3, pp. 9-13.
- Alvarez, A. (2015), "Corporate response to human resource disclosure recommendations", *Social Responsibility Journal*, Vol. 11, No. 2, pp. 306-323.
- Anifowose, M., et al. (2017), "Determinant of human capital disclosure in the post IFRS regime: An examination of listed firms in Nigerian", *Management and Accounting Review (MAR)*, Vol. 16, No. 1, pp. 1-30.
- Ax, C. and Marton, J. (2008), "Human capital disclosures and management practices", *Journal of Intellectual Capital*, Vol. 9, No. 3, pp. 433-55.
- Barot, B. (2017), "Human resources accounting practices in Infosys technologies Ltd.", *International Journal of Current Research*, Vol. 9, No. 1, pp. 45134-45138.
- Bassi, L.J., et al. (2000), "Measuring corporate investments in human capital", in Blair, M.M. and Kochan, T.A. (Eds.), *The New Relationship, Human Capital in the American Corporation*, Brookings Institution, Washington, DC.
- Bontis, N. (2001), "Assessing knowledge assets - a review of the model used to measure intellectual capital", *International Journal of Management Review*, Vol. 3, No. 1, pp. 41-60.
- Bontis, N. (2003), "Intellectual capital disclosures in Canadian corporations", *Journal of Human Resource Costing and Accounting*, Vol. 7, Nos. 1/2, pp. 9-20.
- Bontis, N. and Serenko, A. (2009), "A causal model of human capital antecedents and consequents in the financial services industry", *Journal of Intellectual Capital*, Vol. 10, No. 1, pp. 53-69.
- Bontis, N., et al. (2001), "Managing an organizational learning system by aligning stocks and flows", *Journal of Management Studies*, Vol. 39, No. 4, pp. 437-469.

- Bozzolan, S., et al. (2003), "Italian annual intellectual capital disclosure: an empirical analysis", *Journal of Intellectual Capital*, Vol. 4, No. 4, pp. 543-58.
- Brooking, A. (1996), "Intellectual capital: current issues and policy implications", paper presented at the 23rd Annual Congress of the European Accounting, Munich, 29-31 March.
- Christopher, T. and Kong, G.S. (1998), "Human resource related disclosures made by small Australian mineral mining companies", 10th Asian-Pacific Conference on International Accounting Issues. British Library Board, pp. 136-139.
- Curado, C., et al. (2011), "Intellectual capital disclosure payback", *Management Decision*, Vol. 49, No. 7, pp. 1080-1098.
- Dey, P. K. and Sarkar, A. (2015), "Human capital disclosures in the corporate annual reports: A study on financial institutions of Bangladesh", *The Jahangirnagar Journal of Business Studies*, Vol. 5, No. 1, pp. 53-62.
- Edvinsson, L. (1997), "Intellectual capital: Realizing your company's true value by finding its hidden brainpower", *Harper Business*, New York, NY.
- Epstein, M.J. and Wisner, P.S. (2001), "Balanced scorecard report", *Harvard Business Review*, Vol. 3, No. 4, pp. 10-13.
- Fontana, F.B. and Macagnan, C.B. (2013), "Factors explaining the level of voluntary human capital disclosure in the Brazilian capital market", *Intangible Capital*, Vol. 9, No. 1, pp. 305-321.
- Garg, M.C. (1992), "Recent trends in accounting with particular reference to reporting standards in the corporate sector in India", Unpublished Doctoral Thesis, Maharshi Dayanand University, Rohtak.
- Gupta, D.K. (1992), "Human resource accounting disclosure practices in India: A viewpoint", *Journal of Management*, Vol. 21, pp. 1-4.
- Guthrie, J. and Petty, R. (2000), "Intellectual capital: Australian annual reporting practices", *Journal of Intellectual Capital*, Vol. 1, No. 3, pp. 241-251.
- Hamzah, N., Hassan, M.S., Mohamed, Z.M., Ahmad, A. and Saad, S. (2013), "Annual reporting practices: Human capital information by Malaysian services companies", *UKM Journal of Management*, Vol. 37, pp. 53-62.
- Huang, C.C., et al. (2008), "External reporting of human capital in Malaysia", *Asian Social Science*, Vol. 4, No. 8, pp. 2-10.
- Huang, C.C., et al. (2008), "External reporting of human capital in Malaysia", *Asian Social Science*, Vol. 4, No. 8, pp. 3-11.
- Hussain, A. and Das, D. (2018), "Extent of human resource disclosure in annual reports of companies listed on Indian stock exchange", *IJCSEM International Journal of Computational Engineering and Management*, Vol. 21, No. 5, pp. 33-44.
- Joshi, U. and Mahei, R. (2012), "Human resource accounting system in selected Indian companies", *Journal of Social and Development Sciences*, Vol. 3, No. 2, pp. 69-76.
- Kansal, M. and Joshi, M. (2015), "Reporting human resources in annual reports: An empirical evidence from top Indian companies", *Asian Review of Accounting*, Vol. 23, No. 3, 256-274.
- Khadijeh, K.P. (2015), "Relationship between the average disclosure of human resource accounting information and firm value", *Research Journal of Recent Sciences*, Vol. 4, No. 7, pp. 50-54.
- Kumar, S.P. and Garg, M.C. (2019), "Relationship between Corporate Social Reporting (CSR) practices and company characteristics in Indian companies", *Finance India*, Vol. 33, No. 4, pp. 1001-1014.
- Lengnick-Hall, M.L. and Lengnick-Hall, C.A. (2003), *Human Resource Management in the Knowledge Economy: New Challenges, New Roles, New Capabilities*, Berrett-Koehler Publishers, San Francisco, CA.
- Low, J., Siesfeld, T. and Larcker, D. (1999), "Capital thinking", *Forbes*, p. 41, August 23.
- Mohammad, A.J. (2015), "Human capital disclosures: Evidence from Kurdistan", *European Journal of Accounting Auditing and Finance Research*, Vol. 3, No. 3, pp. 21-31.
- Murthy, V. and Abeysekera, I. (2007), "Human capital value creation practices of software and service exporter firms in India", *Journal of Human Resource Costing and Accounting*, Vol. 11, No. 2, pp. 84-103.
- Olsson, B. (2001), "Annual reporting practices: information about human resources in corporate annual reports in major Swedish companies", *Journal of Human Resource Costing and Accounting*, Vol. 6, No. 1, pp. 39-52.

- Pettrash, G. (1996), "Journey to knowledge value management culture", *European Management Journal*, Vol. 14, No. 4, pp. 365-373.
- Pettersson, J. and Rylme, H. (2003), "Voluntary disclosures of human capital: An explorative study of voluntary disclosure practices in Swedish annual reports", Unpublished Doctoral Thesis, School of Business, Economics and Law, Goteborg University, Goteborg, available at: <http://hdl.handle.net/2077/2282> (accessed 11 December 2018).
- Puri, V., Sharma, B. C. and Kumar, M. (2016), "Voluntary human resource disclosure practices of selected listed Indian IT firms", *Drishtikon: A Management Journal*, Vol. 7, No. 2, pp. 80-104.
- Seetharaman, A., Sooria, H.H.B. and Zaini Saravanan, A.S. (2002), "Intellectual capital accounting and reporting in the knowledge economy", *Journal of Intellectual Capital*, Vol. 3, No. 2, pp. 128-148.
- Sharma, N. and Kumar, M. (2014), "A comparative study of human resource disclosure and reporting practices of selected public and private sector banks in India", *National Monthly Refereed Journal of Research in Commerce and Management*, Vol. 3, pp. 78-86.
- Shukuhian, H. and Ashraf, S.H. (2017), "A comparative study of human resource accounting disclosure practices in Indian companies", *International Journal of Academic Research and Development*, Vol. 2, No. 5, pp. 802-807.
- Stewart, T.A. (1994), "Your company's most valuable asset", *Fortune*, Vol. 130, No. 7, pp. 68-74.
- Subbarao, A.V. and Zeghal, D. (1997), "Human resources information disclosure in annual reports: an international comparison", *Journal of Human Resource Costing and Accounting*, Vol. 2, No. 2, pp. 53-73.
- Vazakidis, A., Stavropoulos, A. and Galani, D. (2013), "Company characteristics and human resource disclosure in Greek", *Procedia Technology*, Vol. 8, Supplement, pp. 112-121.
- Vohra, S.M. (2015), "Human resource accounting disclosure practices in selected Indian public enterprises – An empirical analysis", *International Journal of Scientific Research*, Vol. 4, No. 9, pp. 188-190.
- Whiting, R.H. and Woodcock, J. (2011), "Firm characteristics and intellectual capital disclosure by Australian companies", *Journal of Human Resource Costing and Accounting*, Vol. 15, No. 2, pp. 102-126.
- Zubek, F.F. (2018), "Human resource disclosure: Practice and influence by Qatar listed companies", *International Journal of Economics, Commerce and Management*, Vol. 6, No. 3, pp. 221-240.

\*\*\*\*\*

# Predictor of Customer Trust: Role of Technology



**Dr. Rajiv Sindwani**

Assistant Professor

Department of Management Studies,  
J C Bose University of Science and Technology, Faridabad  
Email: rajiv\_sindwani@yahoo.co.in

## A b s t r a c t

The paper aims to understand the impact of technology in banking service quality dimensions on customer trust and to probe the moderating effect of customer involvement in the relationship. Data was gathered from customers of different banks using a structured questionnaire. AMOS was utilized to investigate the link amid technology banking service quality dimensions and customer trust by testing hypotheses using SEM. The moderating effect was examined using PROCESS module for SPSS. Findings revealed that responsiveness, reliability and security, and personalization have a significant positive effect on customer trust. Convenience was the only dimension that was found to have a non-significant association with customer trust. This study will enlighten banks about the critical technology-based banking factors that require sincere attention for building customer trust, especially in an era of rising automated banking scams.

**Keywords:** *Technology Banking Dimensions, Structural Equation Modeling, Customer Trust, Customer Involvement.*

The advancement of ICT has brought a revolution in the banking sector. Service delivery methods have been changed in the last couple of decades due to development in IT and the prevalent use of the internet (Shankar and Jebarajakirthy, 2019). Like other sectors, the banking sector is also investing heavily in technology. With the passage of time, the banking sector has become reliant on technology to a greater extent. Technology-enabled banking services is significantly different from conventional banking services. In technology banking services, there is occasional interaction between customers and service provider. The banks are focussing towards the use of technology for providing services using a range of electronic banking channels. Almost all types of banks in India are aggressively moving towards automation of banking services (Sindwani and Goel, 2014). Using technology banks are providing services using different channels such as telephone banking (IVR), mobile banking internet and ATM banking. These automated channels are advantageous for banks and their customers. Using technology banks can make service delivery standardized to a greater extent, reduce costs, reduce branch load and expand the service menu options. Technology banking gives value to customers in the form of anywhere-anytime banking. Banking has shown significant improvisation in the last decade. Analytics and artificial intelligence are already being used by banks for different purposes. Due to rising e-banking adoption rate, banks are fighting hard for attracting and retaining customers using technology banking platforms. As the banking products are almost identical in nature, good quality automated banking services will act as a strategy to beat competition (Makanyeza and Chikazhe, 2017). Fundamentally, raising the quality of service of electronic banking is considered as the finest tool to ensure customer trust (Shankar and Jebarajakirthy, 2019).

In literature, building a relationship with customers based on trust has been considered important for business survival and growth. Automated banking quality effect on customer trust has received little attention in Indian automated banking context. Despite the theoretical support, there is a need to examine the degree to which automated service quality affects customer trust in the Indian banking context. Customer trust can be enhanced by providing quality online services; however, this association between quality and trust may vary between high and low involved consumers (Martin et al., 2011). So, the objective of the current study is (a) to examine the relationship between dimensions of

technology banking service quality and customer trust and (b) to investigate the moderating effect of customer involvement in the relationship between technology banking service quality and customer trust.

## **Literature Review**

### **Identification of Technology Banking Service Quality Dimensions**

The literature on electronic service quality stressed upon services offered by websites (Parasuraman et al., 2005). As there is lack of personal touch in e-banking, therefore, scales utilized to measure service quality in context of physical banking are not suitable for e-banking (Jun and Cai, 2001; Shankar et al., 2020). Several attempts have been made by researchers to measure service quality in context of electronic banking (Sindwani and Goel, 2015; Sleimi et al., 2020). To find out technology banking service quality dimensions, PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines of Moher et al. (2009) were followed. Liberati et al. (2009) highlighted that the ultimate objective of PRISMA is to report a literature review in a clear and transparent manner. Based on the guidelines, a review protocol was developed. The protocol covered search strategy, criteria for excluding articles and evaluation of quality.

### **Search Strategy**

The author consulted Google Scholar for a systematic literature review. Keywords were used for finding pertinent studies. Various combinations of keywords related to technology banking service quality, customer trust and customer involvement were used to extract papers from Google Scholar. Articles were screened based on exclusion criteria as shown in table 1. Search resulted in total 427 articles. Articles that come under exclusion criteria were removed. In order to extract relevant articles, author conducted abstracts review. The author selected 56 articles for the full text review.

### **Evaluation of Quality**

The detailed examination of the full text of shortlisted studies was conducted by author for their quality assessment. It helped in analyzing their rigorousness, credibility and relevance. It was conducted on the basis of quality assessment criteria presented in table 2.

The criterion mentioned in table 2 was adapted from Nguyen-Duc et al. (2015). Every criterion had four possible scores: entirely fulfilled (3), sufficiently fulfilled (2), little

fulfilled (1) and completely unfulfilled (0). After imposing quality assessment criterion, studies were arranged on the basis of their scores provided by the author. Author shortlisted 22 studies having an average quality score greater than 1 (Nguyen-Duc et al., 2015). Selected articles were analyzed in depth by the author. Various dimensions and attributes influencing service quality, customer trust and customer involvement were identified from articles. The identified technology banking service quality dimensions were discussed at length with a service quality expert who also uses e-banking regularly. Finally, 4 technology banking service quality dimensions are considered for the present study.

### **Convenience**

It is the measure to which consumers believes that using a system will be effortless (Ahmad and Khan, 2017). In the context of e-banking, it refers to the degree to which a customer utilizes e-banking services comfortably as per his level of information capabilities and knowledge (Nazeri et al., 2019). According to Huang et al. (2019), online customer services focusing on ease of use should provide customers with straightforward operation and understandable interface for contents. An easy to understand interface such as user-friendly login and navigation helps in retaining existing customers and building new customer base (Jun and Palacios, 2016). Researchers have reported convenience/ ease of use as a significant factor influencing service quality in case of electronic services (Roy and Balaji, 2015; Sindwani and Goel; 2016; Ahmad and Khan 2017; Hammoud et al., 2018; Nazeri et al., 2019; Rawwash et al., 2020).

### **Reliability and Security**

Reliability refers to the accurate technical functioning of e-banking services and providing precise services time and again. Security is concerned with the degree to which the e-banking is secure from infringement (Parasuraman et al., 2005; Sindwani, 2018). E-banking requires interchanging confidential data. Hence, it is necessary for the bank electronic platform to be reliable and secure (Raza et al., 2020). Lack of physical human interaction in context of e-banking created security issues related to making financial transactions (Ahmad Al-Hawari, 2014). Therefore, when it comes to transacting online, security is must in order to build trust among customers since there is no face to face contact between customer and employee (Huang et al., 2019). Online service providers should have a transparent

security policy that assists in retaining consumers (Orel and Kara, 2014; Shankar and Jebarajakirthy, 2019). Literature shows that reliability and security have a positive impact on consumer's trust and loyalty in context of e-banking (Kim et al., 2009; Ayo et al., 2016; Hammoud et al., 2018; Shankar et al., 2019; Khatoon et al., 2020; Raza et al., 2020).

### **Responsiveness**

Responsiveness is associated with rapid reaction and willingness to provide support in case of trouble or query related to e-banking services (Parasuraman et al., 2005). It is the willingness to assist customers and to enhance the level of service. It covers aspects like providing timely services, notifying customers about the precise service time and providing services in order to meet customer's demand. George and Kumar (2014) in their research analyzed that responsiveness of banks can enhance customers' satisfaction. Customers usually seek online support services when they face difficulty. Speed of response of service provider towards customer's problems highly affects the service quality. The faster the response of service providers, more will be the satisfaction perceived by the customers (Amin, 2016; Jun and Palacios, 2016; Huang et al., 2019; Hammoud et al., 2018; Nazeri et al., 2019; Khatoon et al., 2020; Raza et al., 2020).

### **Personalisation**

It is the degree to which e-banking services can be customized/modified according to individual consumer's preferences (Parasuraman et al., 2005; Sindwani and Goel, 2016). Many researchers like Zeithaml et al. (2002) have taken this factor into account in their study regarding automated services. Automated services can be personalized according to user's requirements (Ribbink et al., 2004; Al-Hawari, 2011). Personalized services assist in performing financial transactions easily and quickly. It might raise the satisfaction level of customers as it makes customers more systematized and rational (Albashrawi and Motiwalla, 2019). It can be used for evaluation, comparison and improving methodology of a website's quality (Rocha 2012). Past literature studies reported the impact of personalization on overall service quality (Kassim and Abdullah, 2010; Tong et al., 2012; Sindwani and Goel, 2016; Wang et al., 2017; Dhingra et al., 2020).

### **Technology Banking Service Quality and Customer Trust**

Trust plays a vital role in ascertaining a long-standing association between organization and its customers

(Ribbink et al., 2004; Kishada and Wahab, 2013). Researchers are of the view that trust play an important role in minimizing uncertainty or mitigating the sources of uncertainty (Pavlou et al., 2007). Sirdeshmukh et al., (2002) are of the opinion that trust comprises two aspects, namely, trust in a firm's practices/ policies and trust in staff / employees. In the context of business, trust is considered as one of the most pertinent attributes for strong and collaborative relationship (Kundu and Dutta, 2015). Reichheld and Schefter (2000) stated that to earn the loyalty from customers', organization first need to obtain customer's trust. In online exchange trust is regarded as a critical factor (Grabner-Kraeuter, 2002; Yoon, 2002). E-service quality elements may influence e-trust directly (Grönroos, 2001). In connection to e-business, trust as a construct is presented in many e-commerce researches either as antecedent or as a consequence of other appropriate variables (Fauzi and Suryani, 2019). The influence of quality on customer trust has been analysed by researchers for various services in banking and non-banking context. Ribbink et al. (2004) and Choi and Mai (2018) found positive link among e-service quality and e-trust. Hsieh and Hiang (2004) found service quality as an important indicator of trust in the banking industry. Sahadev and Purani (2008), Al-Hawari (2011), and Kundu and Dutta (2015) examined the effect of e-service quality factors on trust. In spite of positive speculation in studies related to different areas, investigating association between technology banking service quality and customer trust is required. Considering four technology banking service quality factors, the following four hypotheses are tested in this study to examine the effect of technology banking quality on customer trust.

H1: Convenience factor has a significant positive effect on customer trust

H2: Reliability & security factor has a significant positive effect on customer trust

H3: Responsiveness factor has a significant positive effect on customer trust

H4: Personalisation factor has a significant positive effect on customer trust

#### **Moderating effect of customer involvement**

Customer involvement denotes perceived individual relevance of goods or services considering needs, values and interests of customers (Park et al., 2007). In the context of electronic commerce, customer behaviour differs

according to level of involvement with the electronic services (Breugelmans and Campo, 2011; Algharabat et al., 2018). Customer trust can be enhanced by providing good quality online services; however, this alliance between quality and trust may vary between low and high involved consumers (Martin et al., 2011; Shankar and Jebarajakirthy, 2019). High involved customers are likely to devote more time on online channels and cautiously watch the information offered by the channels (Im and Ha, 2011). These customers carefully assess the different aspects of services provided by the organization, resulting in developing trust in case their expectations are met. On the other hand, low involved customers may ignore the information supplied by online service providers, which may result in lack of customer trust (Kim et al., 2009; Gamliel et al., 2013). Usually, the influence of service quality on customer trust is larger for high involved consumers and lower for low involved consumers. This depicts that the influence of technology banking service quality dimensions on trust may vary in accordance with the degree of customer involvement in technology banking. So, to investigate the moderation effect of involvement in the association between technology banking service quality and customer trust, the following hypotheses are tested.

H5: Customer involvement significantly moderates the relationship between convenience and customer trust

H6: Customer involvement significantly moderates the relationship between reliability & security and customer trust

H7: Customer involvement significantly moderates the relationship between responsiveness and customer trust

H8: Customer involvement significantly moderates the relationship between personalization and customer trust

The conceptual model prepared on the basis of dimensions and hypothesized relations proposed in this study is presented in figure 1.

#### **Methodology**

A questionnaire was developed to understand the influence of technology banking service quality on trust. It covered 18 questions measuring technology banking service quality, 3 items related to both consumer trust and customer involvement (refer table 3). Attributes of reliability & security, convenience, personalization and responsiveness are adapted from Ibrahim et al. (2006), Al-Hawari (2011), Ganguli and Roy (2011) and Sindwani and Goel (2016). Three items of customer trust are adapted from Sharma and

Patterson (1999), Morgan and Hunt (1994), Caceres and Paparoidamis (2007), and Al-Hawari (2011). Items of customer involvement are taken from Filieri and McLeay (2013) and Shankar and Jebarajakirthy (2019). Purposive sampling method was employed to gather data from the bank customers in Delhi and NCR using self-administered paper based questionnaires. Customers who utilize minimum one mode of e-banking and are above 18 years of age were considered for the survey.

Out of 400 distributed questionnaires, 328 responses were obtained. 296 from 328 responses were appropriate. Responses from the respondents related to variables were recorded on a 5 point scale (strongly disagree to strongly agree).

### **Data Analysis and Results**

Respondents' demographic information is represented in table 4.

### **Measurement Model**

There are particular measures that may be utilized to examine the model fit in CFA. According to Hair et al. (2010), making use of 3 to 4 indices offers ample proof of model fit. Researchers are required to reveal minimum one absolute index, one incremental index, and chi-square value along with the related degrees of freedom (df). The fit indices values and acceptable fit criterion of the measurement model are as follows: Chi-square/df = 1.812 (<3), Goodness-of-fit Index (GFI) = 0.964 (>0.95), Comparative Fit Index (CFI) = 0.976 (>0.95), Root Mean Square Error of Approximation (RMSEA) = 0.046(<0.05), Tucker-Lewis Index (TLI) = 0.962(>0.95). Statistical values of the measurement model signify that the model fitted well in representing the data. Moreover, the CFI scores for each construct was observed to be higher than the 0.9 level, depicting the unidimensionality of the model (Hair et al., 2010). The Average Variance Extracted (AVE) and Composite reliability (CR) for of all dimensions shown in table 5 are higher than the admissible limit of 0.5 and 0.7 respectively (Fornell and Larcker, 1981; Hair et al., 2010), confirming the reliability of the instrument.

Validity was determined using discriminant validity and convergent validity. Convergent validity represents to degree to which variables of a particular factor represent the same latent construct (Fornell and Larcker, 1981; Hair et al., 2010). Convergent validity in this study is measured by testing the average variance extracted (AVE) (Fornell and Larcker, 1981). The average variance extracted (AVE) for

all constructs is higher than 0.50 (Refer table 5). Discriminant validity is defined as the degree to which latent factors are distinct (Fornell and Larcker, 1981; Siekpe, 2005). Fornell and Larcker (1981) outlined that discriminant validity can be analysed by comparing the average variance extracted (AVE) with the corresponding inter-construct squared correlation estimates. In the correlation matrix of constructs, diagonal elements represent the square root of the AVE and off diagonal entries reflect inter-construct correlations (refer table 6). Diagonal entries are found to be more than the off diagonal entries, supporting the discriminant validity of the constructs.

### **Influence of technology service quality dimensions on customer trust**

Hypotheses were tested through SEM using AMOS. Hypotheses were tested by analysing the path coefficients and the significance level among the constructs. The analysis revealed that convenience was the only dimension having non-significant effect on customer trust (refer table 7). Therefore, hypothesis H2, H3 and H4 were supported and H1 was not supported. Therefore, responsiveness, reliability and security and personalization dimensions were found to have significant effect on customer trust.

### **Moderation effect of customer involvement**

In order to check whether the moderation effect changes as per the degree of consumer involvement (low/ high), moderation test with the help of bootstrapping method in the PROCESS module (Model 1) was performed (Hayes, 2012). The results of moderation hypotheses testing are presented in table 8. The results in table 8 represent that only the interaction effect between reliability & security and customer involvement was significant. This interaction effect was significant as confidence intervals for this interaction effect do not cross the value of zero. The other interaction effects – convenience and customer involvement, responsiveness and customer involvement, and personalization and customer involvement were not significant. Accordingly, H6 was supported, and H5, H7 and H8 were not supported.

### **Discussion and Conclusion**

In this paper, the effect of technology banking service quality dimensions on customer trust is examined. A conceptual framework was developed and empirically tested using the data accumulated from bank customers. CFA confirmed factor structure consisting of four dimensions of technology banking service quality, one dimension of customer trust and

one dimension representing customer involvement. Four hypotheses were examined to investigate the association between technology banking service quality and consumer trust using structural equation modeling. Result of hypotheses testing depicted that reliability and security, responsiveness, and personalization dimensions have a positive significant effect on customer trust. But the influence of convenience dimension with customer trust is not significant. Another set of hypothesis examined the moderation effect of customer involvement. The analysis showed that customer involvement significantly moderates the relationship between reliability and security and customer trust. The finding signifies that high involved technology banking customers expect more reliable and secure automated banking services. In case technology banking service providers fulfil their expectations, this will result in enhanced customer trust. So, overall it can be concluded that the by and large technology banking service quality has a strong influence on customer trust. Convenience is the only factor that is observed to have a positive non-significant effect on consumer trust. Providing convenience (ease of use, 24x7 availability, user friendliness etc.) is not sufficient to create customer trust as customers might perceive this factor as customary as every bank in India is focusing on making technology banking easy for customers. As Personalization, Reliability and Security and Responsiveness factors have a positive influence on customer trust so a bank might build up customer trust by further improving the attributes of these dimensions. Banks could also introduce novel attributes which competitors are not providing and which are hard to imitate. In order to get competitive advantage, banks must keep on updating their technology. Banks are required to transform them with new attributes relevant to technology for superior service quality. During upgradation of existing technology or development of new technology, banks must motivate consumer's participation at the design stage. This will assist banks in understanding the expectations of customers related to quality aspects in upcoming banking services. Moreover, banks also required to allocate ample resources for training and education of customers. All these measures will further enhance trust with technology banking services.

## References

- Ahmad Al-Hawari, M. (2014). "Does customer sociability matter? Differences in e-quality, e-satisfaction, and e-loyalty between introvert and extravert online banking users." *Journal of Services Marketing*, Vol. 28 No. 7, pp. 538-546.
- Ahmad, A., and M.N. Khan, (2017). "Developing a website service quality scale: A confirmatory factor analytic approach." *Journal of internet Commerce*, 16(1), 104-126.
- Albashrawi, M., and L. Motiwala, (2019). "Privacy and personalization in continued usage intention of mobile banking: An integrative perspective." *Information Systems Frontiers*, 21(5), 1031-1043.
- Algharabat, R., et al. (2018). "The effect of telepresence, social presence and involvement on consumer brand engagement: An empirical study of non-profit organizations." *Journal of Retailing and Consumer Services*, 40, 139-149.
- Al-Hawari, M. A. (2011). "Automated service quality as a predictor of customers' commitment: a practical study within the UAE retail banking context." *Asia Pacific Journal of Marketing and Logistics*. 23, 346-366.
- Amin, M. (2016)." Internet banking service quality and its implication on e-customer satisfaction and e-customer loyalty." *International Journal of Bank Marketing*, 34(3), 280-306.
- Ayo, C.K., et al. (2016). "E-banking users' behaviour: e-service quality, attitude, and customer satisfaction." *International Journal of Bank Marketing*, Vol. 34 No. 3, pp. 347-367.
- Breugelmans, E., et al. (2011). "Effectiveness of in-store displays in a virtual store environment." *Journal of Retailing*, 87(1), 75-89.
- Caceres, R. and N.Paparoidamis. (2007). "Service quality, relationship satisfaction, trust, commitment and business-to-business loyalty." *European Journal of Marketing*, Vol. 14 Nos 7/8, pp. 836-67.
- Choi, Y., and D.Mai. (2018). "The sustainable role of the e-trust in the B2C e-commerce of Vietnam." *Sustainability*, 10(1), 291.
- Dhingra, S., et al.. (2020). "A Study of Relationship Among Service Quality of E-Commerce Websites, Customer Satisfaction, and Purchase Intention." *International Journal of E-Business Research (IJEBR)*, 16(3), 42-59.
- Fauzi, A. A., and T. Suryani (2019). "Measuring the effects of service quality by using CARTER model towards customer satisfaction, trust and loyalty in Indonesian Islamic banking." *Journal of Islamic Marketing*, 10(1), 269-289.

- Filieri, R. and McLeay, F. (2013). "Online consumer reviews: why do we adopt them?. Academy of Marketing Annual Conference 2013: "Marketing Relevance, Cardiff, July 8-11.
- Fornell, C., and Larcker, D. F. (1981). "Evaluating structural equation models with unobservable variables and measurement error." *Journal of Marketing Research*, 18(3), 39-50.
- Gamliel, E., et al.. (2013). "Framing and involvement effects on consumers' brand choice." *EuroMed Journal of Business*.
- George, A. and Kumar, G. (2014). "Impact of service quality dimensions in internet banking on customer satisfaction." *Decision*, Vol. 41, No. 1, pp.73–85.
- Grabner-Kraeuter, S. (2002). "The role of consumers' trust in online-shopping." *Journal of Business Ethics*, Vol. 39 Nos 1/2, pp. 43-50.
- Grönroos, C. (2001). "The perceived service quality concept – a mistake?." *Managing Service Quality*, Vol. 11 No. 3, pp. 150-152.
- Hair, J.F. Jr, et al.. (2010). *Multivariate Data Analysis*, 7th ed., Prentice-Hall.
- Hammoud, J., et al.. (2018). "The impact of e-banking service quality on customer satisfaction: Evidence from the Lebanese banking sector." *SAGE Open*, 8(3), 2158244018790633.
- Hayes, A. F. (2012). "PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling."
- Hsieh, Y. and Hiang, S. (2004)." A study of the impacts of service quality on relationship quality in search-experience-credence services." *Total Quality Management & Business Excellence*, Vol. 15, pp. 43-55.
- Huang, Z et al. (2019). "Online customer service quality of online shopping: evidence from Dangdang. com. " *Cluster Computing*, 22(6), 15285-15293.
- Ibrahim, E. E., et al. (2006). "Customers' perception of electronic service delivery in the UK retail banking sector." *International Journal of Bank Marketing*.
- Im, H., and Ha, Y. (2011). "The effect of perceptual fluency and enduring involvement on situational involvement in an online apparel shopping context." *Journal of Fashion Marketing and Management: An International Journal*.
- Jun, M., and Palacios, S. (2016). "Examining the key dimensions of mobile banking service quality: an exploratory study." *International Journal of Bank Marketing*.
- Jun, M., and Cai, S. (2001). "The key determinants of internet banking service quality: a content analysis." *International Journal of Bank Marketing*, 19, 276-291.
- Kassim, N., and Asiah Abdullah, N. (2010). "The effect of perceived service quality dimensions on customer satisfaction, trust, and loyalty in e-commerce settings: A cross cultural analysis." *Asia Pacific Journal of Marketing and Logistics*, 22(3), 351–371.
- Khatoon, S., et al. (2020). "The Mediating Effect of customer satisfaction on the relationship between Electronic banking service quality and customer Purchase intention: Evidence from the Qatar banking sector." *SAGE Open*, 10(2), 2158244020935887.
- Kim, J., et al. (2009). "The role of retail quality, e-satisfaction and e-trust in online loyalty development process", *Journal of Retailing and Consumer Services*, Vol. 16 No. 4, pp. 239-247.
- Kishada, Z.M.E. and Wahab, N.A. (2013). "Factors affecting customer loyalty in Islamic banking: Evidence from Malaysian banks." *International Journal of Business and Social Science*, Vol. 4 No. 7, pp. 264-273.
- Kundu, S., and Datta, S. K. (2015). "Impact of trust on the relationship of e-service quality and customer satisfaction." *EuroMed Journal of Business*, 10(1), 21-46.
- Liberati, Alessandro et al. (2009). "The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration." *Journal of clinical epidemiology*. 62 . e1 - 34 . 10 . 1016 / j.jclinepi.2009.06.006.
- Makanyeza, C., and Chikazhe, L. (2017). "Mediators of the relationship between service quality and customer loyalty." *International Journal of Bank Marketing*.
- Martin, J. K., et al. (2011). "The impact of consumer involvement on satisfaction with and use of assistive technology." *Disability and Rehabilitation: Assistive Technology*, 6(3), 225-242.
- Moher, D., et al.. (2009). "Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement." *Annals of internal medicine*, 151(4), 264-269.

- Morgan, R. M., and Hunt, S. D. (1994). "The commitment-trust theory of relationship marketing." *Journal of Marketing*, 58(3), 20-38.
- Nazeri, A., et al. (2019). "The effect of the internet banking service quality on customer satisfaction (case study: Refah bank in Tehran)." *International Journal of Services and Operations Management*, 34(1), 65-80.
- Nguyen-Duc, A., et al. (2015). "The impact of global dispersion on coordination, team performance and software quality—A systematic literature review." *Information and Software Technology*, 57, 277-294.
- Orel, F.D. and Kara, A. (2014). "Supermarket self-checkout service quality, customer satisfaction, and loyalty: empirical evidence from an emerging market." *Journal of Retailing and Consumer Services*, Vol. 21 No. 2, pp. 118-129.
- Parasuraman, A., et al. (2005). "ES-QUAL a multiple-item scale for assessing electronic service quality." *Journal of Service Research*, 7, 213-233.
- Park, D. H., et al. (2007). "The effect of on-line consumer reviews on consumer purchasing intention: The moderating role of involvement." *International journal of electronic commerce*, 11(4), 125-148.
- Pavlou, P. A., et al. (2007). "Understanding and mitigating uncertainty in online exchange relationships: a principal-agent perspective." *MIS Quarterly*, 31, 105-136.
- Rawwash, H., et al. (2020). "Factors affecting Jordanian electronic banking services." *Management Science Letters*, 10(4), 915-922.
- Raza, S. A., et al. (2020). "Internet banking service quality, e-customer satisfaction and loyalty: the modified e-SERVQUAL model." *The TQM Journal*.
- Reichheld, E.E. and Schefter, P. (2000). "E-loyalty: your secret weapon on the web," *Harvard Business Review*, Vol. 78 No. 4, pp. 105-113, pp. 290-312.
- Ribbink, D., et al. (2004). "Comfort your online customer: quality, trust, and loyalty on the internet." *Managing Service Quality*, Vol. 14 No. 6, pp. 446-56.
- Rocha, Á. (2012). "Framework for a global quality evaluation of a website." *Online Information Review*.
- Roy, S. K., et al.. (2015). "Measurement and validation of online financial service quality" (OFSQ). *Marketing Intelligence & Planning*.
- Roy, S. K., and Ganguli, S. (2011). "Generic technology-based service quality dimensions in banking." *International Journal of Bank Marketing*, 29(2), 163-189.
- Sahadev, S., and Purani, K. (2008). "Modelling the consequences of e-service quality." *Marketing Intelligence & Planning*, 26, 605-620.
- Shankar, A., et al. (2019). "Are the Generic Scales Enough to Measure Service Quality of Mobile Banking? A Comparative Analysis of Generic Service Quality Measurement Scales to Mobile Banking Context." *Services Marketing Quarterly*, 40(3), 224-244.
- Shankar, A., et al.. (2020). "Exploring Mobile Banking Service Quality: A Qualitative Approach." *Services Marketing Quarterly*, 1-23.
- Sharma, N. and Patterson, P. (1999). "The impact of communication effectiveness and service quality on relationship commitment in consumer, professional services." *The Journal of Services Marketing*, Vol. 13 No. 2, pp. 151-70.
- Siekpe, J. S. (2005). "An examination of the multidimensionality of flow construct in a computer-mediated environment." *Journal of Electronic Commerce Research*, 6(1), 31-43.
- Sindwani, R. (2018). "Technology-Based Self-Service Banking Quality Dimensions, Customer Satisfaction, and Loyalty: Linkages and Implications for Management." *Optimizing Current Practices in E-Services and Mobile Applications* (pp. 139-159). IGI Global.
- Sindwani, R., and Goel, M. (2015). "The impact of technology based self-service banking service quality on customer loyalty." *International Journal of Marketing & Business Communication*, 4(3), 13-22.
- Sindwani, R., and Goel, M. (2014). "Dimensions of technology based self service banking service quality." *YMCAUST International Journal of Research*, 2(2), 17-25.
- Sindwani, R., and Goel, M. (2016). "The Relationship between Service Quality Dimensions, Customer Satisfaction and Loyalty in Technology based Self Service Banking." *International Journal of E-Services and Mobile Applications (IJESMA)*, 8(2), 54-70.
- Sirdeshmukh, D., et al.. (2002). "Consumer trust, value and loyalty in relational exchanges." *Journal of Marketing*, 66(1), 15-37.

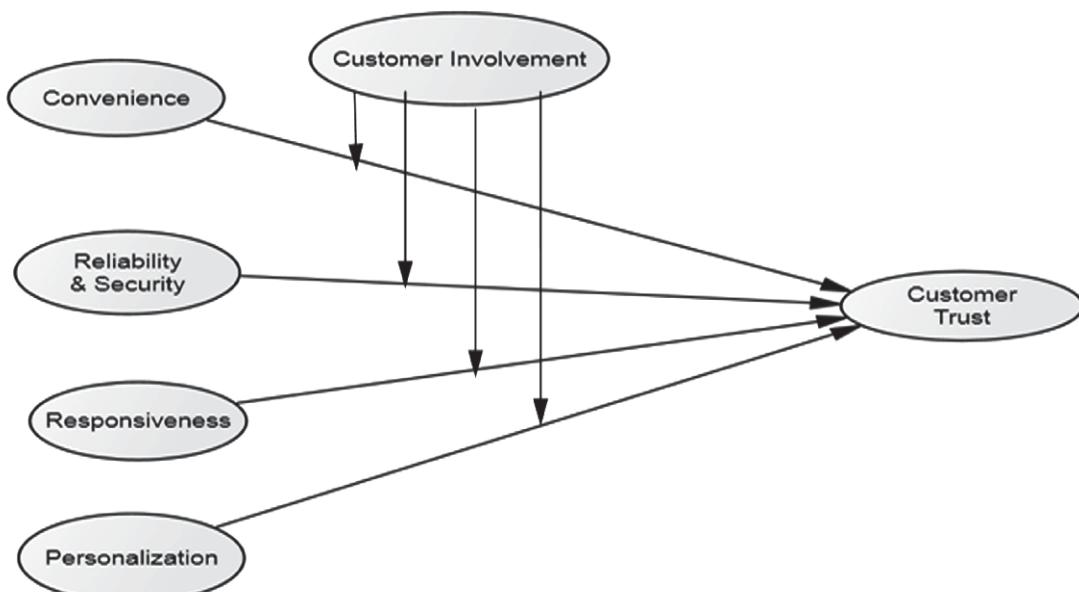
Sleimi, M., et al. 2020). "E-Banking services quality and customer loyalty: The moderating effect of customer service satisfaction: Empirical evidence from the UAE banking sector." *Management Science Letters*, 10(15), 3663-3674.

Tong, C., et al. (2012). "The influence of service personalization, customer satisfaction and switching cost on e-loyalty." *International Journal of Economics and Finance*, 4(3), 105–114

Wang, M., et al. (2017). "The impact of personalization and compatibility with past experience on e-banking usage." *International Journal of Bank Marketing*.

Yoon, S.J. (2002). "The antecedents and consequences of trust in online-purchase decisions." *Journal of Interactive Marketing*, Vol. 16 No. 2, pp. 47-63.

Zeithaml, V., et al. (2002). "Service quality delivery through websites: a critical review of extant knowledge." *Journal of the Academy of Marketing Science*, Vol. 30, pp. 362-75.



**Figure 1: The conceptual framework**  
Source: The author

**Table 1: Exclusion criteria**

Exclusion Criteria	
Excl 1	Articles in language other than English
Exc 2	Articles not in Peer reviewed journal like conference papers, book chapters etc.
Exc 3	Articles where technology banking service quality, customer trust or customer involvement is not the major theme

Source: The author

**Table 2: Assessment criteria**

Code	Criteria
C1	<b>Problem statement:</b> The research objectives are properly explained in the study
C2	<b>Data Collection:</b> Factors used in the study are relevant for achieving objectives
C3	<b>Data analysis:</b> Data analysis used in the study is properly explained
C4	<b>Conclusions:</b> Findings are clearly reported and support results

Source: The author

**Table 3: Technology banking service quality and customer trust attributes**

Factor Name	Related Items
<b>Convenience</b>	Technology banking consumes less time in comparison to branch banking
	Technology banking services are easy to use
	Technology banking services can be availed any time
	Technology banking provides more autonomy in terms of mobility
	Technology banking services provide user-friendly interface and system
	Technology banking has ample menu options to fulfil daily banking requirements
<b>Reliability and Security</b>	Security elements are incorporated in technology banking and I am made familiar with security features
	I feel secure that my private details will not be disclosed to third party while using technology banking
	Technology banking always conduct accurate transactions
	Technology banking provides consistent services
	Financial transactions conducted using technology banking are secure
<b>Responsiveness</b>	Technology banking give instructions to novel users
	Technology banking provides customer feedback services
	I receive quick response to my requests while using technology banking
	In case of problems, the technology banking system helps me to resolve them
<b>Personalization</b>	Technology banking acknowledges me by name
	Technology banking presents product offerings as per my choices
	Technology banking provides the sufficient and precise information I need
<b>Customer Trust</b>	My bank has high integrity
	I have full confidence in my bank and its services
	My bank can be trusted to keep its promises
<b>Customer Involvement</b>	I put efforts in evaluating the given information over technology banking platform
	I deeply think about the information available over technology banking platform
	I personally get involved in technology banking transactions

Source: The author

**Table 4: Profile of the respondents (N=296)**

		Percent (Rounded off)
Gender	Male	62
	Female	38
Age (in years)	18 - up to 30	28
	Greater than 30 -up to 40	34
	Greater than 40- up to 50	26
	Greater than 50	12
Highest Education	12th or Below	NIL
	Pursuing Graduation or Graduate	74
	Post Graduate and higher	26
Occupation	Student	19
	Salaried	52
	Self employed	21
	Others	8
Annual Income (in INR Lacs per annum)	Up to 5	24
	Greater than 5- up to 10	47
	Greater than 10- up to 15	18
	Greater than 15	11
Technology banking usage per month	Up to 10 times	62
	Greater than 10 – up to 15 times	29
	Greater than 15 – up to 20 times	7
	Greater than 20 times	2

Source: The author

**Table 5: Convergent Validity and Reliability metrics**

	Composite Reliability	Average Variance Extracted
<b>Convenience</b>	0.898	0.595
<b>Reliability &amp; Security</b>	0.927	0.718
<b>Responsiveness</b>	0.800	0.521
<b>Personalization</b>	0.882	0.714
<b>Customer Trust</b>	0.783	0.547
<b>Customer Involvement</b>	0.826	0.613

Source: The author

**Table 6: Discriminant validity**

	<b>Customer Involvement</b>	<b>Reliability &amp; Security</b>	<b>Responsiveness</b>	<b>Personalization</b>	<b>Customer Trust</b>	<b>Convenience</b>
<b>Customer Involvement</b>	0.783					
<b>Reliability &amp; Security</b>	0.109	0.847				
<b>Responsiveness</b>	-0.067	0.326	0.722			
<b>Personalization</b>	0.217	0.291	0.206	0.845		
<b>Customer Trust</b>	0.676	0.168	-0.014	0.265	0.740	
<b>Convenience</b>	0.181	0.482	0.295	0.397	0.300	0.771

Source: The author

**Table 7: Standardised regression weights and the significance level for hypothesised paths**

<b>Relation between Constructs</b>	<b>Path Coefficients/ Standardized Regression Weights</b>	<b>Significance Level</b>
Convenience → Customer Trust	0.064(NS)	0.357
Reliability and Security → Customer Trust	0.178***	***
Responsiveness → Customer Trust	0.223***	***
Personalization → Customer Trust	0.274***	***

NS implies “not significant”; \*\*\*Implies significant at p < 0.001

Source: The author

**Table 8: Moderation effect**

<b>Interaction</b>	<b>Coefficient</b>	<b>SE</b>	<b>P Value</b>	<b>LLCI</b>	<b>ULCI</b>	<b>Moderation</b>
Convenience X Customer Involvement	0.0458	0.0451	0.3109	-0.0430	0.1345	No
Reliability & Security X Customer Involvement	0.1003	0.0471	0.0342	0.0075	0.1931	Yes
Responsiveness X Customer Involvement	0.0850	0.0594	0.1540	-0.0320	0.2019	No
Personalization X Customer Involvement	-0.0096	0.0601	0.8727	-0.1278	0.1086	No

Source: The author

\*\*\*\*\*

# Banking: e-Route Challenges in Oman



**Dr. Nadia Sha**  
Assistant Professor  
Department of Finance and Economics  
CCBA, Dhofar University, Oman,  
Email: nsha@du.edu.om,



**Dr. Gabriel Simon Thattil,**  
Professor, Department of Commerce  
Kerala University, Kerala  
Email: simon.thattil@gmail.com



**Dr. Shariq Mohammed**  
Assistant Professor  
Department of Accounting, CCBA  
Dhofar University, Oman,  
Email: smohammed@du.edu.om

## A b s t r a c t

The Oman banking sector has adopted internet banking only after 2005, and at present Oman banking sector is providing various banking services through their e-channel facilities. The study has identified the extent of bank customers' usage of e-channel facilities, factors which encourage the bank customers' usage of e-channel services and reasons for lack of bank customer's usage of e-channel facilities. Primarily, the study analyses the customers' usage of e-channel facilities. Secondly, the study identified the factors which are supposed to encourage the usage of e-channel services and the reason for lack of usage of e-channel services. The study has selected 200 sample respondents by using a purposive sampling method. It found that e-channel illiteracy is the major reason for lack of usage of e-channel facilities.

**Keywords:** *e-Channels, e-Banking illiteracy, Oman Banking Sector, Awareness, Insecurity*

The Sultanate of Oman one of the oldest and traditional independent states in the Arab world and are heavily dependent on oil and gas resources and these two resources are able to generate between 68% and 85% of total government revenue. The natural resources of Oman have given increasing growth in socio-economic development. In 1972, three banks were registered with about as many branches in the country. Now 17 commercial banks are running and have 429 branches spread all over the country. Of these, seven banks are incorporated locally and ten are branches of foreign banks. The local banks have 13 branches and one representative office abroad. The Oman Banking history was closely related with Muscat Currency Authority, this authority came into being in 1970, and after two years this authority becomes Oman Currency Board. These two government bodies and Banking Law of 1974 laid the foundations for the establishment of Central Bank of Oman. By 2010, 89 per cent of the assets in the total banking system were held by the seven local banks and 11 per cent were held by the ten branches of foreign banks. The first edition of KPMG Oman banking perspectives report has revealed that Oman's banking sector remains in a fairly robust position underpinned by strong asset growth and innovation through technology, which is enabling the industry to improve operational efficiency, augment revenue and reduce risk, and enhance customer experience (KPMG-Report, 2018). The report revealed that the Omani banking sector remained well capitalised and profitable in 2017, with the credit growth remaining healthy despite economic challenges. The report also found that the banking sector in Oman is playing an important role in supporting the economy by financing public and private sector projects and assisting small and medium-sized enterprise (SMEs). These references indicate that Oman Banking Industry is in a healthy position and this will show an increasing trend in future. In this context, this article entitled, Banking –Challenges for the E-Route in Oman, examines the current status of banking through the electronic route and examines the causes for low usage for this channel in Oman.

### **Banking System in Oman**

The CBO (Central Bank of Oman) is the apex body of commercial banks in Oman by law. The objective of this body is; like all the central banks throughout the world; to regulate and supervise the monetary and financial strength of the economy in Oman. Article 1 (a) of the Oman Banking Law states the objective as to stimulate the strong growth of banking sector and confirm the upkeep of both the financial as well as monetary stability of the country which will improve the position the country is having in the financial

matters. There are seven local commercial banks and nine foreign banks as of 2016.

### **Review of Literature**

The review of literature is presented under three heads .viz., significant evidence regarding usage of e-channel services, factors which encourage the usage of e-channel services and reason for low of e-channel usage.

In 2000, Sullivan said that internet technology has the potential to play a leading role in the banking industry and economy, this technological advancement is enabling to offer innovative banking services to their customers (Sullivan, 2000). He further explains that banks, customers, intermediaries and society benefits now depend on internet banking technology and its process. In this context, the main question is; what are the benefits of internet in the banking industry. There are two major benefits identified by Karjaluoto, i.e., banks would be able to reduce transactional costs, reach customers anywhere, and enhance its reputation in the industry; and customers would be able to take full advantage of various banking services available online (Karjaluoto, 2002b).

In the research field, often it can be seen that, quite a number of banking-based studies were comparing the traditional and modern banking industry. Wisner and Corney have compared the traditional and internet-based banking industry and they found that internet is providing uncertainty than opportunities in the absence of information. Hence availability of information enabling the customers to decide their strategies, this indicates that the internet or internet banking facility is only a box containing different types of tools. Without any information about the usage and benefits of these tools, customer can't access these tools to decide their strategy for using internet banking facilities (Wisner and Comey, 2001).

Jayawardhen and Foley say that there are two factors affecting banking industry i.e., external factors and internal factors (Jayawardhen & Foley, 2000). The external means remote environment, and internal means operating environment. Changes in the remote environment will impact directly or indirectly on the operating environment (Finlay, 2000). This shows that external (remote) environment has a major effect on the internal (operating) environment and business. Then he explained that technological environment (remote environment) is of the factor among total eight other factors. This indicates that technological environment will make a direct or indirect impact on the operating environment (Finlay, 2000).

The growth of every product depends on the satisfaction of customers, because customer is always expecting at higher level about a particular product. Likewise, customers are expecting high efficiency in e-channel services performance. Customers' perceptions of service-quality offered by banks met the customers' expectations in all dimensions except security dimension where it was found negative. Other dimensions such as efficiency, system availability, fulfillment, service variety, responsiveness, and contact respectively had a positive gap between customers' perceptions and expectations. Hence, it can be concluded that the respondents surveyed; where having a positive perception about e-channel services offered by banks in the Sultanate of Oman (Sushil Kumar & Niraj Mishra, 2017). One of the research has found that service quality gives positive impact to the satisfaction and commitment of customers, i.e., quality of service is a powerful marketing technique in the purview of banks (Sam David Jayakumar & Narsis, 2011), on the other side, these service quality is increasing the satisfaction of banking customers, at present majority of the banking services were linked with technologies, Hence the quality of service is closely attached with technology links.

Another study conducted by Sadi concluded that level of patronage among the customers in Oman was low which was expected to improve with boost of newer technology in mobile networks in the Sultanate (Sadi et. al., 2010). In 2008, Al-Hajri has made a conclusion about the usage of advance banking technology in Oman. The study concluded that most of banks in Oman were conducting banking transactions using traditional methods (Al-Hajri, 2008).

Another study concluded in a different point of view regarding the performance of Oman Banking sector. The study indicated that efficiency of the banking sector in Oman was not superior to the GCC level, and in many of the indicators, they were ranked in the third or last quarter of the ranking. In addition, the comparison illustrated that the participation of Omani banks as a driver of economic development was far below the average of the GCC's and the world's banks (Saeed Al-Muharrami, 2016). Nadia Sha studied about the electronic banking ethicalities on doing e-commerce transactions among commercial banks in India, which resulted that there is still an inhibition among the e-banking customers under study to do the e-payment directly to the commerce domain. This was because of the lack of taking responsibilities by the commercial banks in case of any fraud attempt. The statement that is mentioned in every

transaction of e-banking products which resembles the phenomenon of Caveat Emptor, that the customer is aware, which majority of the starters in this field stutter to do e-payments. The study reminded the particular service providers to take a step towards that area on taking into consideration of the ethicalities in this field (Nadia Sha, 2017)

Al-Hajri identified that there are four perception issues were affected in e-banking adoption in Sultanate of Oman i.e., relative advantage; organizational performance, customer relationship and ease of use (Al-Hajri, 2008). The study recommended that development of telecommunication infrastructure, customers education, and awareness of security and privacy issues were the major solution for the thing which inhibits the usage of e-channel services.

Many banking related studies were pointing out the importance of customer awareness regarding banking services, especially in the internet banking services. Sohail and Shanmugham pointed out that a bank's promotional efforts indeed facilitate awareness of internet banking adoption and its benefits (Sohail & Shanmugham, 2003). Amsaveni & Kanagarathinam argue that manual work in the banking sector has not been quick and precise; the solution is only through the implementation of e-banking services. Hence the customers can easily access the banking services and it will reduce the manual workload. Their study suggested providing awareness programme and training to all strata of public, bank customers and bank employees (Amsaveni, T. & Kanagarathinam, M., 2017). Kariyawasam & Jayasiri found that lack of knowledge on e-banking facility is one of the influential factors towards the lack of usage of internet banking (Kariyawasam & Jayasiri, 2016). These studies were mentioning the importance of awareness programme among the public regarding e-banking services and many studies have used internet banking usage as their research objectives and Karjaluoto et. al. also considered internet banking as factor to be measured the usage of banking services (Karjaluoto et.al., 2002).

The available review of literature indicates that technological environment will make direct impact on the operating environment (Finlay, 2000), likewise updated new technological environment and technological changes will directly influence the operating environment of banking industry. In 2008, Al-Hajri found in a study that most of banks in Oman are conducting banking transactions using traditional methods (Al-Hajri, 2008). The study also

mentioned that relative advantage; organizational performance, customer relationship and ease of use are the four major perception issues were affected in e-banking adoption in Sultanate of Oman. The study recommended that developing telecommunication infrastructure, customers' education, and awareness of security and privacy issues are the major solution for increasing e-banking usage. And later Sushil Kumar and Niraj Mishra found that Oman bank customers have a positive perception regarding e-banking services offered by banks in the Sultanate of Oman ((Sushil Kumar & Niraj Mishra, 2017). The review of prior studies indicates that banking sectors have major role in the development of a nation and technological updation is one of the major tools in the banking sector. Dannenberg and Kellner suggest that internet banking services reduce the cost of maintaining bank branch network and transaction cost (Dannenberg & Kellner, 1998). In addition, Wisner and Corney found that without an information flow, this technological updation is worthless for customers, because usage knowhow will increase the usage of internet banking facilities.

### Statement of Problem

Internet banking or online banking is one of the technological advancement in the banking sector which facilitates performing bank transaction and services with the help of internet technology. Sultanate of Oman has already implemented internet banking technology and now all the licensed banks are providing e-channel (internet banking) services to their bank customers. The review of prior studies indicates that the main barriers of using e-channel facilities were problems regarding trust, usefulness, ease of use of technology and fear about security issues. Another important issue which was identified is customers' awareness level regarding the e-channel services and its usage.

According to the world internet users statistics in 2018; out of the total Oman population, 68.50 per cent of them are using internet facilities and only 2 per cent among the total Middle East are internet using population and it is 0.07 per cent of the world population..

**Table 1**  
**Middle East country wise Population and Internet Users Statistics 2018**

Middle East	Population (2018 Est.)	Users, in Dec-2000	Internet Usage 31-Dec-17	% Population
Bahrain	15,66,993	40,000	15,35,653	98.00%
Iran	820,11,735	2,50,000	567,00,000	69.10%
Iraq	393,39,753	12,500	190,00,000	48.30%
Israel	84,52,841	12,70,000	67,40,287	79.70%
Jordan	99,03,802	1,27,300	87,00,000	87.80%
Kuwait	41,97,128	1,50,000	41,04,347	97.80%
Lebanon	60,93,509	3,00,000	55,46,494	91.00%
Oman	48,29,946	90,000	33,10,260	68.50%
Palestine (State of)	50,52,776	35,000	30,55,088	60.50%
Qatar	26,94,849	30,000	26,44,580	98.10%
Saudi Arabia	335,54,343	2,00,000	302,57,715	90.20%
Syria	182,84,407	30,000	60,25,631	33.00%
United Arab Emirates	95,41,615	7,35,000	93,85,420	98.40%
Yemen	289,15,284	15,000	70,31,784	24.30%
<b>TOTAL</b>	<b>2544,38,981</b>	<b>32,84,800</b>	<b>1640,37,259</b>	<b>64.50%</b>

Source: [www.internetworldstats.com](http://www.internetworldstats.com)

<b>Table 2</b> <b>Internet Users in the Middle East and the World in 2018</b>				
<b>Middle East Region</b>	<b>Population (2018 Est.)</b>	<b>Internet Users 31-Dec-17</b>	<b>Oman Internet Users</b>	<b>Oman % of Internet Users</b>
<b>Total Middle East</b>	2544,38,981	1640,37,259	33,10,260	2.0 %
<b>Rest of the World</b>	7,380,319,981	3,995,403,425		
<b>World Total</b>	7,634,758,428	4,159,440,684		0.07%

**Source:** [www.internetworldstats.com](http://www.internetworldstats.com)

Table 1 indicates that majority (68.50 per cent) of the Oman people are using internet facilities. And the world fact book by CIA indicates that out of the total Oman population 93 per cent of them are literate, which means age 15 and over can read and write. From the review of prior studies, world fact book and world internet users' statistics reveal that majority of the population are using internet facilities, majority of them are literate and major obstacles in the adoption of online banking were problem regarding trust, usefulness, ease of use of technology and fear about security issues. In this context the present study focuses on the usage of e-channel facilities provided by the bank, bank customer's awareness level regarding e-channel services and factors constraining the use e-channel services.

### Objectives of the Study

- 1) To identify the extent of usage of e-channel facilities offered by bank.
- 2) To assess the factors which encourage the bank customers' usage of e-channel services offered by Oman banks
- 3) To identify the reason for low usage of e-channel facilities offered by banks in Oman to customers

### Hypothesis of the Study

- H<sub>1</sub>: There is no significant difference among the banks with regards to the bank customers' usage of e-channel
- H<sub>2</sub>: There is no significant difference among the banks with regards to the bank customers' usage of other services offered through e-channel
- H<sub>3</sub>: The factors which are not contributing statistical significance for predicting the usage of e-channel services provided by Oman Banks
- H<sub>4</sub>: There is no significant difference among the banks with regards to the reason for lack using e-channel services.

### Methodology

The Shely Study has used both secondary and primary data. Secondary data was collected from Internet World Stats-Usage and population statistics <https://www.internetworldstats.com/stats5.htm>, Al Markazi Bi-Monthly publication of the Central Bank of Oman-2017, various research studies, articles, and The National-online newspaper-2017. The primary data were collected from Oman bank account holders.

### Sample design

The sample selection was setup through four stages.

#### *Stage one -Selection of Governorate*

The Sultanate of Oman is divided into Eleven Governorates. From the eleven Governorates, five were selected by using simple random sampling method. The selected Governorates are Ad Dakhiliyah, Al Batinah North, Al Wusta, Ash Sharqiyah South, and Dhofar.

#### *Stage Two-Selection of Provinces from 5 Governorates*

One province is selected from each Governorate randomly, the provinces are Nizwa from Ad Dakhiliyah, Sohar from Al Batinah North, Mahout from Al Wusta, Jalan Bani Bu Ali from Ash Sharqiyah South, and Salalah from Dhofar

#### *Stage three- Selection of Local Licensed Banks*

At present total seven local banks have been working at Oman. Hence the study has decided to select 60 per cent sample from total number of banks. Simple random sampling method was used to select 4 banks; the selected banks are Bank Dhofar SAOG, Oman Arab Bank SAOC, National Bank of Oman SAOG, and Bank Muscat SAOG.

**Table 3**  
**Sample Distribution of the Study**

	Governorate	Province	Selected Banks	Sample	Total		
1	Ad Dakhiliyah	<u>Nizwa</u>	Bank Dhofar	10	40		
			Oman Arab Bank	10			
			National Bank of Oman	10			
			Bank Muscat	10			
2	Al Batinah North	<u>Sohar</u>	Bank Dhofar	10	40		
			Oman Arab Bank	10			
			National Bank of Oman	10			
			Bank Muscat	10			
3	Al Wusta	<u>Mahout</u>	Bank Dhofar	10	40		
			Oman Arab Bank	10			
			National Bank of Oman	10			
			Bank Muscat	10			
4	Ash Sharqiyah South	<u>Jalan Bani Bu Ali</u>	Bank Dhofar	10	40		
			Oman Arab Bank	10			
			National Bank of Oman	10			
			Bank Muscat	10			
5	Dhofar	<u>Salalah</u>	Bank Dhofar	10	40		
			Oman Arab Bank	10			
			National Bank of Oman	10			
			Bank Muscat	10			
Total sample size of the study					<b>200</b>		

#### **Stage four- Selection of Customers**

The study has selected 40 bank customers from each selected bank. Purposive sampling method was used to select sample from each province. The sample selection criteria used was that the sample respondents have bank account and is a regular bank customer. Here, the regular customer means the person used his bank for at least 3 to 5 bank transaction per month.

#### **Justification of Methodology**

The Study used random selection method and purposive sampling method for constructing sampling frame. Random sampling method was used to select the study area, because the number of governorate and provinces are finite. Purposive sampling method was used to select the sample respondents (Bank Customers). Each bank has complete list of their customers details, but as per bank policy, they were not allowed to disclose their customers' details, Hence population of bank customers were treated as unknown population.

#### **Period of Study and Data Collection Process**

The study is conducted through two different stages. The first stage was started in December 2017 and second stage was started in July 2018. The purpose of the first stage was to identify the frequency of bank customers' usage of four e-channel facilities provided by the four selected banks. In this stage, study identified the usage of e-channel services provided through four e-channel facilities. After collecting the opinion, researcher has provided a brief awareness about e-channel facilities and its usage to each respondent. The purpose of second stage was to identify the factors which encourage the usage of e-channel services and reason for lack of using other services provided through ATM, cash deposit machine, online banking and Mobile banking. A structured questionnaire was used in the study for collecting the opinion of bank customers.

#### **Tools Used for Analysis**

The study used both descriptive and inferential statistics.

The descriptive statistics used are mean value and Standard Deviation and the inferential statistics are One Way

ANOVA, Tukey HSD (Multiple Comparison), Simple Linear Regression and Kruskal-Wallis H test.

### **Reliability Statistics**

The Cronbach's Alpha test was used to find the internal consistency of scaled data with the specific sample used in the study

### **Reliability Statistics**

Cronbach's Alpha <sup>a</sup>	N of Items
.891	41

The reliability statistics indicate that there is an internal consistency with the variables and scales used in the study. The Cronbach's Alpha value .891 (41 items) indicates a high level of internal consistency for the scale used in the study with this specific sample.

### **Data analysis and Discussion**

Data analysis is presented under two parts:

The first part presents the profile sample respondents and the second part providing the usage of e-channel services. These factors are encouraging the usage of e-channel services and reason for lack of using e-channel services.

#### **Part I**

The majority (72 per cent) of the respondents are male and 28 per cent of them are female. Majority (52 per cent) of the respondents are government employees, 20 per cent of them are running their business, 12 per cent of them are working at private firm, 8 per cent of them are working in the banking sector, 6 per cent of them are housewife and remaining percent of them are students.

#### **Part II**

The variables covered include usage of E-channel Services, factors encouraging the Usage of e-channel Services and reason for Low E-Channel Service Usage

#### *Bank customers Usage of E-channel Services:*

E-channel usages of bank customers are mentioned in the table 4.

<b>Table 4</b> <b>Mean Distribution of Oman Bank customers According to their Usage of E -channel Services</b>			
	N	Mean	Std. Deviation
ATM Machine	200	4.35	.820
CDM Machine	200	2.26	1.004
Online Banking	200	2.89	.838
Mobile Banking	200	3.24	1.633

*Source: Primary Data*

Table 4 shows the bank customers' usage of e-channel services. Result indicates that majority of the respondents often uses ATM machine (4.35), Cash Deposit Machine

usage is very rare (2.26), at the same time majority of the respondents are in an opinion that sometimes they are using online banking (2.89) and mobile banking (3.24)

#### **Table 5 Significant difference among the Bank Customers Usage of e-channel-One Way ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
ATM Machine	Between Groups	.895	3	.298	.440	.725
	Within Groups	132.900	196	.678		
	Total	133.795	199			
CDM Machine	Between Groups	2.440	3	.813	.805	.492
	Within Groups	198.040	196	1.010		
	Total	200.480	199			
Online Banking	Between Groups	1.540	3	.513	.729	.536
	Within Groups	138.040	196	.704		
	Total	139.580	199			
Mobile Banking	Between Groups	4.840	3	1.613	.602	.615
	Within Groups	525.640	196	2.682		
	Total	530.480	199			

*Source: Primary data*

Table 5 evaluated whether there is any significant difference in the usage of four e-channel services. Result indicated that the p-value all of the e-channel services is greater than 5 per

cent significant level, hence it can be inferred that there is no significant difference among the banks with regards to the usage of four e-channel services.

**Table 6**  
**Mean distribution among the Bank Customers According to their Usage of Other Services Provided Through E- Channel Facilities**

	E-channel Services	Selected Banks				
		BD	OAB	NBO	BM	Total
ATM Machine Usage	Cash withdrawal	4.46	4.54	4.38	4.50	4.47
	Mini statement	2.46	1.86	1.76	1.92	2.00
	Balance inquiry	2.14	1.84	1.70	1.88	1.89
	Self-fund transfer	2.14	1.68	1.64	1.70	1.79
	Third party transfer	2.32	2.12	1.98	1.76	2.05
	Change PIN code	1.18	1.00	1.18	1.14	1.13
	Card less cash withdrawal	1.12	1.06	1.06	1.12	1.09
	Update mobile number	1.00	1.00	1.00	1.00	1.00
Cash Deposit Machine Usage	Cash Deposit	1.60	2.50	1.62	1.20	1.73
	Bill Payment	1.18	1.00	1.00	1.00	1.05
	Mobile Top-Up	1.00	1.00	1.02	1.00	1.01
	Donations	1.00	1.00	1.00	1.00	1.00
	Credit Card Payment	1.14	1.00	1.00	1.00	1.03
	Cheque Deposit	1.16	1.02	1.10	1.06	1.08
Online Banking Usage	Balance inquiry	1.74	2.08	1.68	1.34	1.71
	Mini Statement	1.04	1.00	1.00	1.00	1.01
	Frizzed amount inquiry	1.52	1.38	1.24	1.40	1.39
	Cheque inquiry	1.32	1.22	1.20	1.22	1.24
	Full account statement	1.48	1.50	1.58	1.48	1.51
	Credit Card Payment	2.74	2.78	2.70	3.34	2.89
	Transferring Funds	2.12	2.30	2.98	2.52	2.48
	Bill Payment	1.34	1.10	1.30	1.50	1.31
Mobile Banking Usage	Utility bills payment	3.36	3.30	3.20	3.82	3.42
	Mobile Recharge	4.02	3.70	3.64	3.90	3.82
	Credit cards dues payment	1.00	1.00	1.12	1.00	1.03
	ATM, CDM & branch location finder	1.10	1.24	1.20	1.12	1.17
	Fund Transfer	2.96	3.16	3.50	3.12	3.18

Source: Primary Data

Table 6 shows the bank customers usage of e-channel services of selected banks. Five-point frequency scales (Always, Often, Sometimes, Rarely and Never) was used to find the usage of e-channel services. Bank customers' usage of e-channel services were distributed among the four selected bank. The total mean score is also shown in the result.

#### **ATM Machine Usage**

The result indicated that out of the total 200 sample respondents, majority of the bank customers have never used ATM machine for changing their PIN code (1.13), Card less cash withdrawal (1.09) and updating mobile number (1.00) and ATM machine for Third party transfer were rarely used (2.05), Self-fund transfer (1.79), Balance inquiry (1.89), and Mini statement (2.00). Result also shows that majority of the bank customers are often using ATM machine for cash withdrawal (4.47).

#### **Cash Deposit Machine Usage**

The result indicates that majority of the bank customers were rarely using CDM for depositing cash (1.73) and the

majority of them have never used other services like Bill Payment (1.05), Mobile Top-Up (1.01), Donations (1.00), Credit Card Payment (1.03), and Cheque Deposit (1.08).

#### **Online Banking Usage**

The Result shows that bank customers have never used online banking for Mini Statement (1.01), Frizzed amount inquiry (1.39), Cheque inquiry (1.24), and Bill Payment (1.31). Bank customers were rarely using online banking for balance enquiry (1.71) and Transferring Funds (2.48) and sometimes they pay their credit card bill (2.89) through online banking.

#### **Mobile Banking usage**

Bank customers have never used mobile banking facilities for paying their credit card dues (1.03) and finding ATM, CDM and branch location (1.17). Whereas sometime they were using their mobile banking facility for Utility bills payment (3.42), and Fund Transfer (3.18). Result also indicate that bank customers are often using mobile banking for recharging their mobile phone (3.82)

**Table 7**  
**Significant difference among the Bank Customers according to their Usage of Other Services Provided through ATM Counter**

		Sum of Squares	df	Mean Square	F	Sig.
Cash withdrawal	Between Groups	.700	3	.233	.471	.703
	Within Groups	97.120	196	.496		
	Total	97.820	199			
Mini statement	Between Groups	14.760	3	4.920	3.582	.015
	Within Groups	269.240	196	1.374		
	Total	284.000	199			
Balance inquiry	Between Groups	5.060	3	1.687	1.772	.154
	Within Groups	186.520	196	.952		
	Total	191.580	199			
Self-fund transfer	Between Groups	8.260	3	2.753	2.797	.061
	Within Groups	192.920	196	.984		
	Total	201.180	199			
Third party transfer	Between Groups	8.335	3	2.778	2.590	.054
	Within Groups	210.260	196	1.073		
	Total	218.595	199			
Change PIN code	Between Groups	1.095	3	.365	1.306	.274
	Within Groups	54.780	196	.279		
	Total	55.875	199			
Cardless cash withdrawal	Between Groups	.180	3	.060	.582	.627
	Within Groups	20.200	196	.103		
	Total	20.380	199			
Update mobile number	Between Groups	.100	3	.033	.386	.763
	Within Groups	16.920	196	.086		
	Total	17.020	199			

Source : primary data

Table 7 evaluated whether there is any significant difference in the usage of e-channel services through ATM among the Oman banks. Result indicated that majority of the e-channel services (provided through ATM) test significant value (p-value) is greater than the alpha (0.05) except one service i.e., mini statement facility. Based on the majority, it could be seen that there is no significant

difference in the usage of e-channel services through ATM among Oman banks. Whereas, mini statement facility ( $F=3.582$ ,  $.015<0.05$ ) shows no statistically significant difference. Hence Tukey HSD (Multiple Comparisons) test is used to identify which of the group is significantly different from each other.

**Table 8 Multiple Comparisons- Tukey HSD**

Tukey HSD						
Dependent Variable	(I) Bank	(J) Bank	Mean Difference (I - J)	SE	Sig.	95% Confidence Interval Lower Bound      Upper Bound
Mini statement	Bank	OAB	.600	.234	.064	-.01      1.21
	Dhofar	NBO	.700*	.234	.017	.09      1.31
		BM	.540	.234	.101	-.07      1.15

\*. The mean difference is significant at the 0.05 level.

Source : primary data

Table 8 shows that there is a significant difference between Bank Dhofar customers' usage and National Bank of Oman customers' usage regarding mini statement ( $0.017<0.05$ ).

**Table 9**  
**Significant Difference among the Bank Customers according to their Usage of Other Services Provided Through Cash Deposit Machine**

		Sum of Squares	df	Mean Square	F	Sig.
Cash Deposit	Between Groups	5.640	3	1.880	1.840	.141
	Within Groups	200.280	196	1.022		
	Total	205.920	199			
Bill Payment	Between Groups	1.215	3	.405	5.161	.002
	Within Groups	15.380	196	.078		
	Total	16.595	199			
Mobile Top-Up	Between Groups	.015	3	.005	1.000	.394
	Within Groups	.980	196	.005		
	Total	.995	199			
Donations	Between Groups	.175	3	.058	.628	.598
	Within Groups	18.220	196	.093		
	Total	18.395	199			
Credit Card Payment	Between Groups	.615	3	.205	3.482	.017
	Within Groups	11.540	196	.059		
	Total	12.155	199			
Cheque Deposit	Between Groups	.535	3	.178	1.663	.176
	Within Groups	21.020	196	.107		
	Total	21.555	199			

Source : primary data

Table 9 analysed whether there is any significant difference in the usage of e-channel services through Cash Deposit Machine among the Oman banks. Result indicates that majority of the e-channel services (provided through Cash Deposit Machine) test significant value (p-value) is greater than the alpha (0.05) except two services i.e., Bill Payment facility and Credit Card Payment. Based on the majority, it could be seen that there is no significant difference in the

usage of e-channel services through Cash Deposit Machine among Oman banks.

The two services i.e., Bill Payment facility ( $F=5.161$ ,  $.002<0.05$ ) and Credit Card Payment facility ( $F=3.482$ ,  $.017<0.05$ ) shows statistically significant difference.

Hence Tukey HSD (Multiple Comparisons) test is used to identify which of the groups is significantly different from each other.

**Table 10 Multiple Comparisons- Tukey HSD**

Tukey HSD						
Dependent Variable	(I) Bank	(J) Bank	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval
						Lower Bound
Bill Payment	Bank Dhofar	OAB	.180*	.056	.008	.03 .33
		NBO	.180*	.056	.008	.03 .33
		BM	.180*	.056	.008	.03 .33
Credit Card Payment	Bank Dhofar	OAB	.140*	.049	.022	.01 .27
		NBO	.120	.049	.067	-.01 .25
		BM	.120	.049	.067	-.01 .25

\*. The mean difference is significant at the 0.05 level.

Source : primary data

Table 10 illustrates that there was a significant difference among the bank customers' usage of Cash Deposit Machine for bill payment ( $.008<0.05$ ) whereas, there was a

significant difference between Bank Dhofar and Oman Arab Bank customers' usage of Cash Deposit Machine for paying their credit card bills ( $.022<0.05$ )

**Table 11: Significant difference among the Bank Customers according to their Usage of Other Services Provided through Online Banking**

		Sum of Squares	df	Mean Square	F	Sig.
Balance inquiry	Between Groups	13.780	3	4.593	5.378	.001
	Within Groups	167.400	196	.854		
	Total	181.180	199			
Mini Statement	Between Groups	.060	3	.020	2.042	.109
	Within Groups	1.920	196	.010		
	Total	1.980	199			
Frizzed amount inquiry	Between Groups	1.975	3	.658	1.099	.351
	Within Groups	117.380	196	.599		
	Total	119.355	199			
Cheque inquiry	Between Groups	.440	3	.147	.368	.776
	Within Groups	78.040	196	.398		
	Total	78.480	199			
Full account statement	Between Groups	.340	3	.113	.161	.922
	Within Groups	137.640	196	.702		
	Total	137.980	199			
Credit Card Payment	Between Groups	13.660	3	4.553	1.703	.168
	Within Groups	523.920	196	2.673		
	Total	537.580	199			
Transferring Funds	Between Groups	20.680	3	6.893	3.351	.020
	Within Groups	403.240	196	2.057		
	Total	423.920	199			
Bill Payment	Between Groups	4.060	3	1.353	3.059	.029
	Within Groups	86.720	196	.442		
	Total	90.780	199			

Table 11 evaluated whether there was any significant difference in the usage of e-channel services through Online Banking among Oman banks. Results indicated that majority of the e-channel services (provided through Online Banking) test significant value (p-value) was greater than the alpha (0.05) except three services i.e., Balance inquiry, Transferring Funds, Bill Payment.

Based on the majority, it can be inferred that there was no significant difference in the usage of e-channel services through Online Banking among Oman banks.

The two services i.e., Balance inquiry ( $F=5.378, .001<0.05$ ) Transferring Funds ( $F=3.351, .020<0.05$ ) and Bill Payment ( $F=3.059, .029<0.05$ ) shows statistically significant difference. Hence Tukey HSD (Multiple Comparisons) test was used to identify which of the groups were significantly different from each other.

**Table 12 Multiple Comparisons- Tukey HSD**

Tukey HSD						
Dependent Variable	(I) Bank	(J) Bank	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval
						Lower Bound
Balance inquiry	Oman Arab Bank	BD	.340	.185	.258	-.14 .82
		NBO	.400	.185	.137	-.08 .88
		BM	.740*	.185	.001	.26 1.22
Transferring Funds	Bank Dhofar	OAB	-.180	.287	.923	-.92 .56
		NBO	-.860*	.287	.016	-1.60 -.12
		BM	-.400	.287	.504	-1.14 .34
Bill Payment	Oman Arab Bank	BD	-.240	.133	.275	-.58 .10
		NBO	-.200	.133	.437	-.54 .14
		BM	-.400*	.133	.016	-.74 -.06

\*. The mean difference is significant at the 0.05 level.  
Source : primary data

Table 12 found that there was a significant difference between Oman Arab Bank and Bank Muscat customers usage of Online banking for balance inquiry ( $.001<0.05$ ) and their Bill Payment ( $.016<0.05$ ) simultaneously, result

showed that there was a significant difference between Bank Dhofar and National Bank of Oman customers' usage of Online Banking for transferring fund ( $.016<0.05$ ).

**Table 13: Significant difference among the Bank Customers according to their Usage of other Services Provided through Mobile Banking**

		Sum of Squares	df	Mean Square	F	Sig.
Utility bills payment	Between Groups	11.320	3	3.773	3.566	.015
	Within Groups	207.400	196	1.058		
	Total	218.720	199			
Mobile Recharge	Between Groups	4.655	3	1.552	1.424	.237
	Within Groups	213.500	196	1.089		
	Total	218.155	199			
Credit cards dues payment	Between Groups	.540	3	.180	3.128	.067
	Within Groups	11.280	196	.058		
	Total	11.820	199			
ATM, CDM & branch location finder	Between Groups	.655	3	.218	.587	.624
	Within Groups	72.900	196	.372		
	Total	73.555	199			
Fund Transfer	Between Groups	7.735	3	2.578	1.442	.232
	Within Groups	350.420	196	1.788		
	Total	358.155	199			

Source : primary data

Table 13 analysed whether there was any significant difference in the usage of e-channel services through Mobile Banking among Oman banks. Result indicated that majority of the e-channel services (provided through Mobile Banking) test significant value (p-value) was greater than the alpha (0.05) except Utility bills payment. Based on the majority, it can be inferred that there was no significant

difference in the usage of e-channel services through Mobile Banking among Oman banks.

The service, i.e. Utility bills payment ( $F=3.566, .015<0.05$ ) showed statistically significant difference. Hence Tukey HSD (Multiple Comparisons) test was used to identify which of the groups were significantly different from each other.

**Table 14: Multiple Comparisons- Tukey HSD**

Tukey HSD							
Dependent Variable	(I) Bank	(J) Bank	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Utility bills payment	National Bank of Oman	BD	-.160	.206	.864	-.69	.37
		OAB	-.100	.206	.962	-.63	.43
		BM	-.620*	.206	.015	-1.15	-.09

\*. The mean difference is significant at the 0.05 level.

Source : primary data

Table 14 showed that there was a significant difference between Oman Arab Bank and Bank Muscat customers usage of mobile banking for paying their utility bills ( $.015<0.05$ ).

#### Factor Encouraging the Usage of e-channel Services

**Table 15: Regression Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.846 <sup>a</sup>	.716	.708	.28428
a. Predictors: (Constant), Secured e-channel system, Ease of Use, Knowledge about the use of e-channel facilities, Awareness about e-channel facilities, Usefulness				
b. Dependent Variable: Usage of e-channel services				
Source : primary data				

Table 15 depicted the Regression Model summary for predicting the Usage of e-channel services. The R (Correlation) value with .846 indicated that there exist a high correlation between predicted and observed satisfaction. Hence, it can be inferred that this model predicts the bank customers' usage of e-channel services rather preciously. The R Square value .716 indicated that the proportion

(82 per cent) of variance in the usage of e-channel services can be explained by five predictors i.e., Secured e-channel system, Ease of Use, Knowledge about the use of e-channel facilities, Awareness about e-channel facilities and usefulness. The adjusted R Square value .708 indicated that model gives a more realistic indication of its predictive power i.e., predicting usage of e-channel services.

**Table 16 Regression ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.442	5	7.888	97.608	.000
	Residual	15.678	194	.081		
	Total	55.120	199			

Source : primary data

Table 16 showed the Regression ANOVA result which indicated the statistical significance of the regression model for predicting the bank customers' usage of e-channel services. Result indicated that at Alpha ( $\alpha$ ) =0.05 level of significance, there exists enough evidence to conclude that the slope of population regression line is not zero and found significant difference ( $F=97.608$ ,  $p\text{-value}=.000$

$<0.05$ ), hence it can be inferred that these five predictors i.e., Secured e-channel system, Ease of Use, Knowledge about the use of e-channel facilities, Awareness about e-channel facilities, Usefulness are useful for predicting the bank customers' usage of e-channel services

**Table 17: Coefficients of Simple Linear Regressions**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.246	.206		1.196	.000
	Usefulness	.256	.022	.400	9.754	.000
	Ease of Use	.185	.020	.524	13.375	.000
	Awareness about e-channel facilities	.213	.022	.464	11.462	.000
	Knowledge about the use of e-channel facilities	.262	.018	.406	10.394	.000
	Secured e-channel system	.140	.019	.289	7.338	.000
a. Dependent Variable: Usage of e-channel services						
Source : primary data						

The result indicated that knowledge about the use of e-channel facilities has high coefficient than the other predictors i.e., .262. Hence, it can be inferred that knowledge about the use of e-channel facilities where increasing the bank customers' usage of e-channel services when compared to the other predictor's coefficient. Result also indicated that all the predictors have p-value less than 5 per cent significant level, which were contributing statistically significant to the model for predicting the usage of e-channel services.

The fitted model for measuring bank customers' usage of e-channel services is derived as: Usage of e-channel services: 1.246 (Constant) +.256 (Usefulness) +.185 (Ease of Use) +.213 (Awareness about e-channel facilities) +.262 (Knowledge about the use of e-channel facilities) +.140 (Secured e-channel system)

**Ease of Use**  
**Usefulness**

### Lack of E-Channel Services Usage

**Table 18 Mean Distribution of Bank Customers According to the Reasons for Lack of E-Channel Services Usage**

	N	Mean	SD	Rank
Fear of using e-channel services	200	1.6150	.94936	5
Insecurity	200	1.8950	.82302	4
Lack of awareness regarding e-channel services	200	3.4050	.79000	3
Lack of technical knowledge	200	3.3150	1.00540	2
E-channel Illiteracy about the usage of services	200	4.7700	.51811	1
Source : primary data				

Table 18 showed mean rank of reason for not using e-channel services by the bank customers of Oman. The respondents gave first rank to e-channel illiteracy about the

usage of services and second rank was given to lack of technical knowledge and the third rank to lack of awareness regarding e-channel services.

**Table 19**  
**Difference in ranks among the Banks According to the Reasons for Lack of E-Channel Services Usage**

	Bank	Fear	Insecurity	Lack of awareness	Lack of TK	Illiteracy
N	Bank Dhofar	50	50	50	50	50
	Oman Arab Bank	50	50	50	50	50
	National Bank of Oman	50	50	50	50	50
	Bank Muscat	50	50	50	50	50
	Total	200	200	200	200	200
Mean Rank	Bank Dhofar	105.90	103.38	96.45	92.98	98.43
	Oman Arab Bank	98.74	100.96	101.31	102.12	100.40
	National Bank of Oman	99.59	96.91	101.31	103.77	102.77
	Bank Muscat	97.77	100.75	102.93	103.13	100.40
	Kruskal-Wallis H	.791	.363	.456	1.324	.293
	df	3	3	3	3	3
	Asymp. Sig.	.852	.948	.928	.724	.961

Source: Primary Data, Grouping Variable: Bank

Table 19 evaluated whether there was any significant difference among the bank customers reason for lack of using e-channel services. Results indicated that all of the reasons have p-value greater than 5 per cent significant level, hence it can be inferred that there is no significant difference among the bank customers' reasons for lack of using e-channel services.

### Conclusion

The present study has focused on how to identify the usage of current e-channel services as well the other facilities provided through Oman Banks e-channel services, factors which encourage the usage of e-channel services and the reason for lack of usage of e-channel services. The study resulted is exploring exciting findings with regards to the bank customers' usage of e-channel services, as the banking sector adopted e-channel services for providing secure, speed and accurate services to their customers, and unfortunately, result indicated the poor usage of e-channel services by the bank customers. The Mansour Naser Alraja et al. (2016) has analysed Oman bank customers' intention to adopt internet banking with regression model. The model has tested two aspects i.e., Perceived Usefulness and Perceived ease of use. The test result indicated that, perceived usefulness is the major factor which is closely related to the bank customers' intention to adopt internet banking. Based on this finding the present article expands the internet banking concepts to e-channel services and also add up three more variables with Perceived Usefulness and Perceived ease of use. The three more variables were awareness about e-channel facilities, knowledge about the use of e-channel facilities and Secured e-channel system.

The result indicated that Knowledge about the use of e-channel facilities and Awareness about e-channel facilities were encouraging the usage of e-channel services along with usefulness and ease of use. Based on the first part data collection, researcher has asked the respondents about the reason for lack of using e-channel services. The results indicated that e-channel illiteracy is the major reason. Hence, this study will be helpful to the banking industry to make further steps to remove the barriers like Fear of using e-channel services, Insecurity, Lack of awareness regarding e-channel services, Lack of technical knowledge, E-channel Illiteracy about the usage of services.

### Major Findings of the Study

From the present study, it found that:

1. Majority of the bank customers often uses ATM machine compared to CDM and sometimes bank customers uses online banking and mobile banking facilities as well.
2. The bank customers often use ATM machine for withdrawing cash compared to other services from ATM counter.
3. The bank customers rarely use cash depositing machine and they never use other facilities incorporated in the cash depositing machine.
4. The bank customers are sometimes using online banking for paying their credit card dues and rarely use full account statement, transferring fund and balance enquiry and also they are not using other facilities incorporated in the online banking system.

5. Most of the bank customers use mobile banking for paying their utility bills, mobile recharge and fund transfer.
6. Most of the bank customers never change their debit/credit card PIN via ATM counter, this is a serious issue because, most of the banks were advising their customers to change their PIN number regularly for avoiding fraud, but unfortunately, they have never used this facility.
7. The bank customers' usage of e-channel facilities are not significantly different among the selected banks in Oman.
8. Based on the regression analysis result, it is found that Knowledge about the usage of e-channel facilities, Usefulness, and Awareness about e-channel facilities will improve the bank customers' usage of e-channel services.
9. The e-channel illiteracy is the major reason for not using e-channel services of Oman banks and also the lack of technical knowledge and lack of awareness regarding e-channel services are the other major reasons for not using e-channel services.

### Suggestions of the Study

1. To provide awareness campaign to bank customers about the benefit of e-channel service usage and make leaflet containing the technical details of the usage of e-channel services.
2. Provide periodic advertisement through TV channel with regards to the benefit and usage of e-channel services.
3. Provide training for bank employees for encouraging their customers for using e-channel services.
4. Make awareness campaign with the cooperation of NGOs, College and school students with regards to changing bank customers Debit/Credit card PIN number regularly for avoiding e-channel fraud.
5. The regression Model suggests that increase the bank customers' Knowledge about the usage of e-channel facilities, Usefulness, and Awareness about e-channel facilities will lead to increase the usage of e-channel services, hence provide printed material incorporated with the bank customers bank passbook with the details of e-channel services and its usage (with technical details).

### References

- Abdus Samad, K., at al. (2011). Services Quality Dimensions: Indian Food Retailers, SCMS Journal of Indian Management, Volume VIII, Number IV, October – December, ISSN 0973-3167, pp-90-103
- Al-Hajri, S. (2008). The Adoption of E-Banking: The Case of Omani Banks. International Review of Business Research Papers, 4(5), 120-128.
- Amsaveni, T. and M. Kanagarathinam. (2017). A Study on Consumer Awareness of E Banking Services in Public Sector Banks in Coimbatore District, IJARIIE, Vol-3 Issue-2, ISSN(O)-2395-4396, [http://ijariie.com/AdminUploadPdf/a\\_study\\_on\\_consumer\\_awareness\\_of\\_e\\_banking\\_services\\_in\\_public\\_sector\\_banks\\_in\\_coimbatore\\_district\\_ijariie4177.pdf](http://ijariie.com/AdminUploadPdf/a_study_on_consumer_awareness_of_e_banking_services_in_public_sector_banks_in_coimbatore_district_ijariie4177.pdf)
- Beegadhur,K.,et.al. (2006). Assessing the Service Quality of Banking Technologies in Mauritius, SCMS Journal of Indian Management, Volume III , Number I, January – March, ISSN 0973 – 3167, pp-62 – 72
- Creswell, J. and Clark (2007). Research design Qualitative, Quantitative, and Mix Methods Approaches. Second Edition, London: Sage.
- Dannenberg, M., and D. Kellner (1998). The Bank of Tomorrow with Today's Technology, International journal of Bank Marketing, vol. 16, no. 2, pp. 90-7.
- Easterby, S., et al. (2008). Management Research, Third Edition. London: Sage.
- Finlay, P. (2000). Strategic Management: An Introduction to Business and Corporate Strategy, London: Prentice Hall.
- Internet World Stats (2018), Internet Usage in the Middle East-Internet Usage and Population Statistics. <https://www.internetworldstats.com/stats5.htm>
- Jayawardhena, C., and P. Foley (2000). Changes in the Banking Sector – the Case of Internet Banking in the UK, Internet Research: Electronic Networking Applications and Policy, 10(1), 19-30.
- Kariyawasam, N., and N. Jayasiri. (2016). Awareness and Usage of Internet Banking Facilities in Sri Lanka. International Journal of Scientific Research and Innovative Technology, 3 . 173-190. , [https://www.researchgate.net/publication/318929992\\_AWARENESS\\_AND\\_USAGE\\_OF\\_INTERNET\\_BANKING\\_FACILITIES\\_IN\\_SRI\\_LANKA](https://www.researchgate.net/publication/318929992_AWARENESS_AND_USAGE_OF_INTERNET_BANKING_FACILITIES_IN_SRI_LANKA)

- Karjaluo, H., et al. (2002a). Factors Underlying Attitude Formation towards Online Banking in Finland, *International Journal of BankMarketing*, Vol. 20, No. 6, pp. 261-72.
- KPMG (2018). Oman banking perspectives report, Publication number: J1637, KPMG Lower Gulf Limited, operating in the UAE and Oman, <https://assets.kpmg/content/dam/kpmg/ae/pdf/Oman-banking-perspectives-2018.pdf>
- Nadia Sha and Shariq Mohammad (2017). Virtual banking and online business. Banks and Bank Systems, 12(1), 75-81. doi:10.21511/bbs.12(1).2017.09
- Sadi, A., et al. (2010). The Prospects and User Perceptions of M-Banking in the Sultanate of Oman, *Journal of Internet Banking & Commerce*, 15(2), 1-11.
- Saeed Al-Muharrami (2016). Banking Sector in Oman: Strategic Issues, Challenges and Future Scenario, Chapter: III, Publisher: College of Banking and Financial Studies, Oman, [https://www.researchgate.net/publication/298143855\\_Evaluation\\_of\\_Banks\\_in\\_Oman\\_Assessment\\_to\\_the\\_GCC's\\_Benchmark](https://www.researchgate.net/publication/298143855_Evaluation_of_Banks_in_Oman_Assessment_to_the_GCC's_Benchmark)
- Sam David Jayakumar and Narsis, (2011). Physical and core services quality: State Bank of India, SCMS Journal of Indian Management, Vol.08, Issue- 4, Publisher-School of Communication & Management Studies, Date: 2011/10/1
- Sohail, M., and B. Shanmugham (2003). E-Banking and Customer Preferences in Malaysia: An Empirical Investigation, *Information Sciences*, 150(4), pp. 207-217.
- Sullivan, R. (2000). 'How Has the Adoption of Internet Banking Affected Performance and Risk in Banks?: A Look at Internet Banking in the Tenth Federal Reserve District, *Financial Industry Perspective*, Vol. 2000, pp. 1-6.
- Sushil Kumar and Niraj Mishra (2017). Customer Satisfaction in E-Banking Sector in Oman, Special Issue on Economic Growth in Oman amidst Oil Crisis: A Diversified Strategic Approach, Research Paper, Ahead International Journal of Recent Research Review, Vol.1, Issue. 11, May, ISSN-2456 205X, [https://www.researchgate.net/publication/324984854\\_customer\\_satisfaction\\_in\\_e-banking\\_sector\\_in\\_oman](https://www.researchgate.net/publication/324984854_customer_satisfaction_in_e-banking_sector_in_oman)
- Tashakkori, A., and Teddlie, C. (1998). Mixed Methodology: Combining Qualitative and Quantitative Approaches. London: Sage.
- Wisner, J., and Corney, W. (2001). Comparing Practices for Capturing Bank Customer Feedback: Internet Versus Traditional Banking, *Benchmarking: An International Journal*, Vol. 8, No. 3, pp. 240-50.
- Financial Stability Report (2018). Published by Financial Stability Department Central Bank of Oman, Issue 6 [https://cbo.gov.om/\\_sites/assets/\\_Documents/English/Publications/FSR/FinancialStabilityReport2018En.pdf](https://cbo.gov.om/_sites/assets/_Documents/English/Publications/FSR/FinancialStabilityReport2018En.pdf)

\*\*\*\*\*

# Size Effect in Indian Equity Market: Discriminant Analysis



**Dr. Deepak Danak**  
Professor of Economics and Finance  
Institute of Management  
Nirma University, Ahmedabad  
Email: danak@nirmauni.ac.in



**Riya Shah**  
Research Scholar  
Institute of Management  
Nirma University, Ahmedabad  
Email: riyashah@nirmauni.ac.in

## A b s t r a c t

This study aims to document size anomaly as the excess returns on small-sized stocks. Scholars are divided on whether the Indian equity market exhibits any size effect. Further, those who assert the existence of size effect are also divided on whether it shows up as size anomaly or size premium. We believe that looking at the size effect as one of the explanatory variables for explaining any excess returns on equities is the root cause of such a confusion. Therefore, we opt for studying it as an explained variable using Discriminant Analysis.

**Keywords:** *Size Anomaly, Size Premium, Efficient Market Hypothesis, Behavioural Finance, Discriminant Analysis, Risk Penalty.*

**A**sset pricing continues to be one of the most investigated topics in financial economics. Particularly, the issue of size effect is quite heavily investigated, and still, the debate whether the size effect, if evident, should be designated as ‘size premium’ or ‘size anomaly’ does not seem to have settled mainly due to the methodological differences in its examination. Therefore, apparently, there is a need to look at the size effect from a different lens that can be free from the debatable set of underlying assumptions evident in the commonly applied methodologies. Equally important is to search for a reconciliation that can help resolve this long lasted debate.

The path-breaking contribution in the domain of asset pricing was made by Sharpe (1964) and Lintner (1965) by developing Capital Asset Pricing Model (CAPM), which by taking the premise of efficient markets inferred risk premium on security from its realised return. It specified the level of riskiness of security as related to market risk proportionate to its beta. It implied two things. One, the market is the sole explanatory variable; and two, the market is a unified whole. Though CAPM continues enjoying popularity with practitioners, it does not score high in empirical studies. Significantly, the empirical examinations showed that the small-sized stocks (and also the value stocks) were commanding excess return that could not be explained by the overall market risk factor. This resulted into posing a serious challenge to the Efficient Market Hypothesis (EMH) founded by Fama (1970). In response to it, Fama and French (1993) developed a three-factor model, which conceptualised the size and value as two additional factors (i.e. sources of risk) along with the market factor for explaining the realised returns. In another way, it assumed that the market is not singular, rather it is plural where different segments like small stocks and value stocks have different levels of risk as compared to the segments of large-sized stocks and growth stocks, respectively. However, the premise of the segmented market needs to be verified independently by measuring the risk directly rather than inferring it from the realised returns. We contemplate that discriminant analysis can do that job in a convincing manner. So, for examining the size effect, we take size as a categorical dependent variable and divide all the stocks into the two groups of small size vs large size. As per the economic theory, the observed return and observed risk are taken as explanatory variables. We applied the discriminant analysis to the dataset drawn from the Indian capital market and found that the size effect is clearly evident. At this

juncture, we would like to term it as ‘size anomaly’, and not as ‘size premium’ though sometimes the existing literature seems to be using the two terms rather interchangeably. In true sense, size anomaly stands for the excess return on small-sized stocks that cannot be explained with the observed risk associated with it; whereas the size premium stands for the extra risk over and above the observed risk. However, later, we seek to search for a reconciliation between the two by suggesting to replace the statistical measure of risk with its economic implication found in the concept of utility.

### **Significance of the study**

The lens that we employ to examine the size effect is unique, and at the same time, apparently more scientific. Since bifurcating the firms into small vs large size is essentially an act of discrimination, we envisage to subject those size-based two groups to the Discriminant Analysis, and thereby examine how far the factors of return and risk explain the discrimination of firms made based on size. We examine the discriminating ability of return and market risk, as well as the sources of extra risk. We believe that our approach is the most sophisticated one for exploring and explaining the size effect.

Further, we create three sets of portfolios based on market capitalisation, classified on median, tercile and quartile. The classification results increase with moving from median to quartile. This proves the worthiness of the Discriminant Analysis. Thus, our contribution lies not only in finding the fact objectively but also in showing the application of Discriminant Analysis for the first time in the study of pricing anomaly. Additionally, we also search for a new perspective that can help reconcile the debate between ‘size anomaly’ and ‘size premium’.

### **Literature Survey**

The existing literature on the size effect can be grouped into two based on the premise taken by the researcher. One group looks upon it as the size premium on the assumption of market rationality, and the other as the size anomaly under the guise of behavioural finance. Again, within the first group, there are two approaches, namely one that takes the premise of the efficient markets, and the other that seeks to explain the premium by searching for the evidence of higher risk. Therefore, we examine the existing literature by dividing it into three parts. Part-I covers the explanation of size premium under the assumption of efficient markets.

Part-II covers the explanation of size premium by searching for evidence of higher risk. Part-III covers explanations proposed under behavioural finance paradigm.

***Part I: Studies pertaining to size premium under the assumption of efficient markets.***

International studies conducted using the Fama-French approach, which asserted the existence of size premium:

After identification of size effect by Banz (1981), other scholars like Reinganum (1981) and Cook and Rozeff (1984) tried to test whether both the size effect and the value effect (measured as Earnings-to-Price ratio by them) were providing a higher return, or both measured separate characteristics of a single underlying, i.e. the risk premium. However, the results were inconclusive till Fama and French (1993) introduced their three-factor model. They concluded that for the period of 1963-1990 the market risk measured as the beta of security under CAPM did not explain the cross-section of average stock returns. Rather, the size and the book-to-market equity factors captured the cross-sectional variation in average stock returns. Going a step further, Berk (1995) argued that the size effect should not be looked upon as an anomaly, rather it should be regarded as a regularity, which explains a part of the cross-section of expected returns unexplained by an incorrectly specified asset pricing model. Later on, subsequent study of Fama and French (1995) reaffirmed the size premium and documented found that the size was related to profitability. Then, Garza-Gómez et al. (1998) studied the relationships among return, risk and size in the Japanese equity market for the period of July 1957 to June 1994 and found that small stocks outperformed the large stocks. Heston et al. (1999) examined the ability of size and beta to explain the cross-sectional variation in an average return of 12 European countries including Austria, Belgium, Denmark, France, Germany, Italy, Norway, Spain, Sweden, Switzerland, the Netherlands and the UK. The study concluded that average stock returns are positively related to beta and negatively related to firm size, meaning thereby that size premium was also evident.

Leledakis et al. (2003) tested the cross-sectional variation of stock returns using variables like beta, size, book-to-market equity, earnings-to-price, dividend yield, leverage, and sales-to-price. They found that from all the above variables, only size had significant explanatory power. They documented a significant size premium of 1.39 per cent. Al-Rjoub et al. (2005) examined the presence of size effect in the US stock market, taking the stocks traded on NYSE,

AMEX and NASDAQ stock exchanges for the period from 1970 to 1999. The study concluded the existence of the size premium. Chou et al. (2007) tested the existence of size effect in Japan from 1975 to 1997 and found a significant size premium of 0.98 per cent. Easterday et al. (2009) examined the size effect taking the same stock exchanges for the period of 1946 to 2007. The results showed that the return of small firms outperformed the return of large firms for all the months. They also found that the size premium was extremely higher for the month of January. Bauer et al. (2010) tested the Fama French three-factor model, using its static and dynamic specifications, taking consolidated monthly return data of 16 European countries. The study documented the presence of size effect. Lischewski and Voronkova (2012) studied all the stocks on the Warsaw Stock exchange for the period of January 1996 to March 2009. They concluded that the size, along with the market factor, and book-to-market jointly turned out to be significant factors in explaining the return. Zhong et al. (2014) found the existence of size premium after adjusting for market risk in the Australian stock market from 1989 to 2012. Leite et al. (2018) tested the fama french three-factor and five factor model for emerging markets like Brazil, Chile, Mexico, Argentina, India, China, Thailand, Malaysia, Turkey, Poland, Romania, and Russia and found a clear size effect as the return pattern are same in both developed and emerging markets.

Further, we find it apt to mention three studies conducted with some twist in the methodology.

Ammann and Steiner (2008) studied the Swiss stock market in comparison to the US market for the period of January 1990 to December 2005 and documented robust premiums on market, size, value and momentum factors. Steiner (2009) investigated the predictability of monthly size as well as market, value, and momentum premiums using a sample from each of the US and the Swiss stock markets between 1989 and 2007. The study documented that the size premium was somewhat predictable in the Swiss stock market due to the credit spread. Amel Zadeh (2011) examined the existence of size premium in German stock exchange for the period of 1996 to 2006 with reference to some conditions, and documented conditional relation between size and return since the effect of firm size on stock returns was found to be conditional on the firm's past performance. Additionally, the firm size captured the differences in profitability, book-to-market, bid-ask spread and trading volume. The study also concluded that the variation of stock

returns could not be explained by the systematic risk (i.e. market risk).

International studies conducted using Fama-French approach, which did not assert the existence of size premium:

Schrumpf et al. (2007) tested the conditional asset pricing models and multi-factor models in explaining the cross-section of stock returns in Germany. The study did not find any evidence of size premium. Rather, they documented that a conditional CAPM using the term spread explained the returns on their size and book to market almost equally efficiently as the Fama French three factor model. Brailsford et al. (2011) found that there was an insignificant difference in returns between small and large stock portfolios after controlling for book-to-market from 1982 to 2006. Gray and Johnson (2011) also supported the same argument and found the absence of size effect in the Australian stock market for the period of 1983-2007. Hanauer and Linhart (2015) tested the CAPM, Fama french three-factor model for Latin America, EMEA, Asia, and BRIC countries. The study could not find clear evidence of size premium as the micro-cap stocks did not provide a higher return for the study period of 1996-2012. Tauscher and Wallmeier (2016) studied 16 European markets.

Contrary to popular belief, they found that large-sized stocks provided statistically significant premium of 0.45% per month as compared to small stocks for the period of December 1989 to September 2014. Cakici et al. (2016) tried to explain the return with the help of the different parameters including size, book-to-market equity ratio, macroeconomic condition, liquidity, and credit risks for 18 emerging markets for the period of 1990 to 2013. The study found that portfolios based on small size stocks failed to generate superior returns.

### **Indian studies**

In the Indian market, there have been limited studies. Mohanty (2002) studied the Indian stock market from 1991 to 2000. The results supported the existence of size premium. It was also found that variables other than size like Price-to-Book value, market leverage, and Earnings-to-Price ratio did not have any additional explanatory power after adjusting for size effect. Sehgal and Tripathi (2005) also supported the notion of the existence of size premium in India. They found that size based investment strategy is economically feasible as it provides risk-adjusted abnormal

returns. Sehgal et al. (2012) found a statistically significant excess return of 4.4 per cent per month between small stock and large stock returns for the period of 1996 to 2010. On the similar line, Balakrishnan (2016) studied from January 1997 to August 2014 and concluded that capital asset pricing model did not capture average returns on portfolios, and size premium existed in Indian stock market. Likewise, Akhtar et al. (2017) also found that profitable trading strategies can be constructed based on size and value. However, Agarwalla et al. (2017), who studied the factors of size, value and momentum in the Indian market over the period of 25 years from 1st January 1994 to 31st March 2017, rejected the size effect as the size factor had only 0.36 per cent excess return with an annualised volatility of 14.51 per cent.

### ***Part II: Studies pertaining to size premium searching for evidence of higher risk***

The studies conducted under the second approach that searched for the evidence of extra risks did not find the presence of size effect. For example, Patel (2012) compared the performance of small firms with large firms with the help of different statistical tools like Wilcoxon Signed Rank test, Mann-Whitney U test and t-Test for the period of July 1996 to December 2010. The study revealed that the size premium was not found to be consistent over time. Later on, Hussaini (2016) tested the size and value premium in Thailand stock exchange using t-statistic and Sharpe ratio and noted that no conclusive evidence of size premium was found in Thailand stock exchange. In one of the recent studies, Perez (2018) compared the performance of small, medium and large companies with the help of Wilcoxon Rank Sum test, Wilcoxon Signed Rank test, and Kruskal Wallis test. The study concluded that the mean monthly returns of small, medium and large companies were not different for the period of 1997 to 2016 in South Korean market. To our knowledge, there are no noteworthy studies conducted for the Indian market under this approach.

### ***Part III: Studies pertaining to size anomaly under the guise of behavioural finance***

Behavioural finance paradigm is largely looked upon as something opposite to the EMH. However, its contribution lies in searching for the sources of extra risk, that the EMH based approach hypothesises for the small-sized segment of the market. Thus, it should be looked upon as complementary to the EMH based approach. Though the behavioural paradigm started searching for the explanations for the extra risk almost during the same time when Fama-

French was busy developing their multi-factor models, it has come to the fore relatively only recently. Its roots date back to 1993 when two path-breaking studies were published. Jegadeesh and Titman (1993) tested the strategy of buying past winner stocks and selling the past losers stocks from 1965 to 1989. The study found that the higher profitability of those strategies was not due to systematic risk; it could have been due to the overreaction of the market to the information. Hendricks et al. (1993) tested the hot hand strategy by buying the stocks performing well in the last four quarters from 1975 to 1988. The results showed that the hot hand stocks produced superior return as compared to the benchmark portfolio constructed based on firm size.

The emergence and growth of behavioural school can be at least partly attributed to the failure of the first approach to explain the pricing anomalies/premiums, convincingly. Many scholars have tried to identify different behavioural factors which may be responsible for lower valuations and resultant higher returns for small-sized stocks. According to Shleifer and Vishny (1997), small firms are difficult to arbitrage, which makes these firms more mispriced. In that case, the small stocks must be under-priced on average relative to large stocks. So, the size effect should be smaller when controlled for such effects like (i) investor sentiments (see, Barberis et al., 1998), (ii) investor overconfidence (see, Daniel et al., 1998), and (iii) limited arbitrage activity (see, Hong and Stein, 1999). Apart from that, securities of small capitalisation firms are usually unsuitable to the investment requirements of some financial institutions and big investors. Therefore, they attract minimal attention from financial analysts. Those firms are called neglected firms. These stocks may offer a premium as compensation for related information deficiencies, or the pricing inefficiencies exist due to information asymmetry for these stocks (Arbel et al., 1983). Prima facie, the behavioural factors are difficult to be modelled for explaining excess returns on small-sized stocks. However, Carhart (1997) seems to have made a successful effort to capture the behavioural aspect while examining the pricing anomaly. By taking the same route that of Fama-French, he added momentum factor as an explanatory variable along with the economic factors of market risk, size, and book-to-market. Momentum factor groups the stocks into two, namely the winners and the losers. The winners are those stocks that witness subsequent price increases, and the losers are those stocks that witness subsequent price decreases. Thus, the momentum factor can be viewed as a proxy of behavioural influences on stock pricing. As far as the Indian market is

concerned, Agarwalla et al. (2017) examined the momentum factor along with the size and value factors. In their results, the momentum factor stood out as the most influential one, which provided an annualised return of 17.3 per cent with an annualised volatility of 17.06 per cent. The size factor did not show up. Therefore, they documented that the momentum factor was hard to reconcile with market efficiency and risk-based explanations.

### **Critical Review of Literature and Gap Identification**

As noted above, since the size effect was reported by many scholars in devolved markets, the exponents of EMH attempted to dismiss it as an anomaly in favour of designating it as size premium. Since the excess returns on small-sized stocks were persistent over a long period of time, Fama and French (1993), taking the lead in that direction concluded that the small-sized stocks commanded extra risk premium beyond what the CAPM considered as market premium. Thus, small size got identified as an additional source of risk besides the market risk. In another way, the part of the excess return that could not be explained by the market risk got supplemented with size premium. It is needless to reiterate that the approach was taken by Fama and French, and for that matter, many others who followed suit is based on the premise of efficient markets and infers the risk from the realised returns. It is noteworthy that this approach implicitly equates 'identification of risk' with 'ratification of risk'.

Interestingly, as Blume and Durlauf (2008) note, it results into testing the joint hypothesis stating that (i) the security markets are informationally efficient, and (ii) returns behave according to a pre-specified equilibrium model. However, such an observation can be interpreted both the ways and related to CAPM as well as any multi-factor model. They related it to CAPM, and raised the concern against the model specification, which would lead to infer that the market is efficient. However, it can equally be related to any multi-factor model for raising the concern against the model specification, which could lead to infer that the market is inefficient. The second approach liberates itself from testing the joint hypothesis. It directly measures the relationship between the risk-return profiles of the small-sized stocks and the large-sized stocks. In that, the second approach can prove to be a more reliable one. In fact, both need to be looked upon as complementary to each other. Particularly, the listing of the sources of extra risk comes from the first approach, which then can be ratified more objectively by the second approach. Most of the studies in the domain of size

effect have been undertaken as per the first approach, and have established that small-sized firms provide higher return due to the extra risk inherent in them. However, almost all prominent research listed under Part-II reject the notion of size premium. The perceptible difference in the results of the two approaches poses a challenge of reconciling, or for that matter revisiting the modelling done under the two. Meanwhile, the behavioural finance has started catching up, which attempts to approach many such phenomena that are not satisfactorily explained by the rational/efficient market paradigm. However, it also has two limitations. One, it is difficult to capture the behavioural/sentimental aspects into the modelling of an economic phenomenon. Two, it is more relevant for examining short-lived aberrations; it cannot be employed to explain long-lasting phenomena like size effect.

Though the Fama-French Five-Factor Model is the most discussed model of asset pricing in the current times, it leaves away some grey areas. Particularly, as noted earlier, the rationalists' approach infers risk out of the realised return but does not directly measure the incidence of risk emanating from those factors. Therefore, there is an opportunity to subject those economic factors to a test to see how far the so-identified factors get ratified. Of course, that calls for taking a different approach to testing. Particularly, the Fama-French methodology treats the size effect as one of the explanatory factors for the observed excess returns, whereas the direct testing of the size effect calls for looking upon it as a dependent variable. Our intuition is that the Discriminant Analysis can do that job more effectively by treating the size as a categorical variable (divided into two groups of small size vs large size) that can be modelled to be differentiated by the factors of observed return, observed market risk and other sources of risk. It is a direct and a simple approach that avoids complexities of forming multiple portfolios and controlling for other factors to bring out the effect of a particular factor as required under the study of the cross-section of expected stock returns.

### **Research Methodology**

The primary research question in our study is: *Do small-sized stocks outperform large-sized stocks after controlling for the associated risk in the Indian stock market? If they do, then what could be the possible explanations for the same?*

#### ***The Sample***

We extract the data from the website of the Bombay Stock Exchange (BSE) ([www.bseindia.com](http://www.bseindia.com)) and Ace-Equity

database of Accord Pvt. Ltd. The sample is drawn from S&P BSE 500 index, which accounts for nearly 93% of the total market capitalisation on BSE. We take a long timeframe of sixteen years spanning from 2003-04 to 2018-19 to capture the different market conditions in the Indian stock market. Further, we exclude certain companies to avoid any distortions. Accordingly, those companies which are not traded actively and companies having negative net worth are excluded. Likewise, to avoid any distortions in comparisons that may be caused due to different dates of closing the accounts, only those companies are retained who close their accounts on 31st March. Further, following the tradition, finance companies and NBFCs are excluded from such studies due to their distinct nature of business (For example, see Fama and French, 1992).

#### ***Portfolio Construction***

There are a total of 356 companies that satisfy all the above-mentioned requirements. Three sets of portfolios, using buy and hold strategy, are set up based on the market capitalisation of those 356 companies on 31st March 2003. Market capitalisation is one of the widely used measures of size. According to Ball (1978) and Berk (1995), when size is measured by market value, it can be correlated to expected return which influences the risk premium. As per Garza-Gómez et al. (1998), the difference between the returns of small firms and large firms was higher by using market capitalisation than any other measure of size. Therefore, market capitalisation is chosen as the base for bifurcating the companies. It is calculated using the following formula.

#### ***Market Capitalisation***

$$\text{Market Capitalisation} = \frac{\text{Equity paid-up}}{\text{Face value}} \times \text{Closing price} \\ \times \text{Price adjustment factor}^*$$

\*Price adjustment factor is a multiplier to offset the price movement related to corporate events, such as dividend, share split, etc.

Majority of the studies have constructed only one set of the portfolio. However, we construct three sets of portfolios. Towards that, first, the companies are arranged in the ascending order of their market capitalisation. Then, Set-I is constructed by taking the top quartile and the bottom quartile companies as a small-sized stock portfolio and large-sized stock portfolio, respectively. Likewise, Set-II is formed by considering the top tercile and the bottom tercile companies. Finally, Set-III is formed by considering above the median and below the median companies. The portfolio formation is summarised in Table 1.

**Table 1: Number of companies in each set of portfolios**

<b>Set</b>	<b>Particulars</b>	<b>Criterion</b>	<b>No. of Companies</b>
Set I	Small-sized stock portfolio	Top quartile	89
	Large-sized stock portfolio	Bottom quartile	89
Set II	Small-sized stock portfolio	Top tercile	119
	Large-sized stock portfolio	Bottom tercile	119
Set III	Small-sized stock portfolio	Above the median	178
	Large-sized stock portfolio	Below the median	178

*Source:* Compiled by authors

It is noteworthy, here, that our approach does not require a rebalancing of portfolios.

#### **Factors/Variables Calculation**

**Return:** At the first step, monthly return data are obtained, which are then analysed for yearly return as well as for holding period return. As the study is conducted for sixteen years, the returns for 16 holding periods, ranging from one year up to sixteen years, are calculated.

**Risk:** We consider the observed risk of return and measure it as the variance of monthly returns.

As Sharpe (1991) notes, only these two moments of the mean (i.e. return, here) and variance (i.e. risk, here) may serve as adequate representations even if the probability distribution of returns may be quite complex.

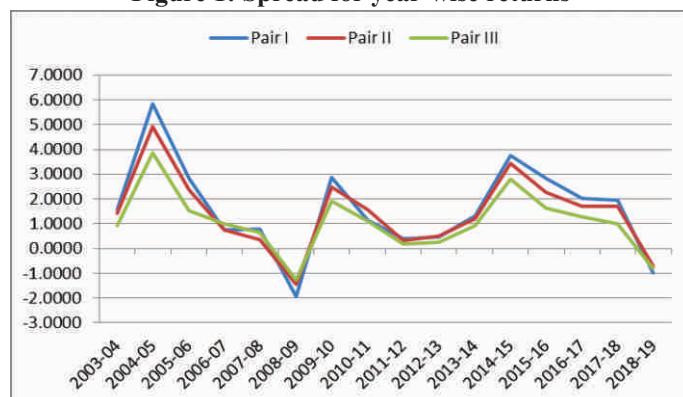
#### **Data Analysis and Results**

We undertake a comparative analysis of performance on two

bases, namely (i) comparison of year-wise performance, and (ii) comparison of holding period-wise performance. As the focus of the study is to understand the persistence of size effect, the analysis of longer holding period return is expected to unfold the differing chemistry of risk and return between the two portfolios.

#### **Year-wise Analysis of Returns**

To know whether the size effect is *prima facie* visible or not in the Indian market, we find spread in returns of the two portfolios calculated as return on small-sized portfolio minus return on the large-sized portfolio. The result is captured in Figure 1, which shows that except for the year 2008-09, the spread was positive for all the years. It is noteworthy that the Indian stock market was in the downturn at that point of time (The downturn was started in January 2008). It is interesting to note that, in the next year, 2009-10, the small-sized stock portfolio significantly gained over the

**Figure 1: Spread for year-wise returns**

*Source:* Based on authors' calculations

The spread being positive, we subject it to a statistical test of significance. We use t-Test for the same. Towards that, first, we checked for the normality of the return data using the Kolmogorov-Smirnov test of normality, which showed that the normality condition is satisfied. The results of the normality test are not reported here for want of space. Further, as a prelude to the t-Test, F Test is conducted to decide whether to use t-Test with equal variance or t-Test with unequal variance. F test shows that the *p* values for all

the three sets are significant at least at 5% level in all the years except for 2009-10 in case of median-based and quartile-based portfolios. Since F test reveals significant differences in variances in the two groups, the t-Test is conducted on the premise of unequal variances. The results of t-Test for the difference in year-wise returns between the small-size's portfolio (SSP) and large-size's portfolios (LSP) are shown in Table 2.

**Table 2: t-Test of Year-wise Returns Assuming Unequal Variances**

Particulars	Set I (Quartile-based)			Set II (Tercile-based)			Set III (Median-based)		
	Year	Mean Return (SSP)	Mean Return (LSP)	<i>p</i> value	Mean Return (SSP)	Mean Return (LSP)	<i>p</i> value	Mean Return (SSP)	Mean Return (LSP)
2003-04	9.69%	8.13%	0.04	9.64%	8.20%	0.02	9.25%	8.33%	0.05
2004-05	10.34%	4.50%	0.00	9.40%	4.46%	0.00	8.91%	5.06%	0.00
2005-06	7.49%	4.64%	0.00	7.03%	4.65%	0.00	6.60%	5.06%	0.00
2006-07	1.06%	0.30%	0.09	0.95%	0.22%	0.06	1.13%	0.14%	0.02
2007-08	3.35%	2.56%	0.12	2.89%	2.55%	0.29	2.77%	2.13%	0.10
2008-09	-4.63%	-2.71%	0.00	-4.53%	-3.09%	0.00	-4.80%	-3.55%	0.00
2009-10	10.49%	7.60%	0.00	10.53%	8.05%	0.00	10.73%	8.81%	0.00
2010-11	1.82%	0.67%	0.01	2.18%	0.62%	0.00	1.78%	0.68%	0.00
2011-12	0.22%	-0.17%	0.20	0.11%	-0.22%	0.21	-0.20%	-0.38%	0.28
2012-13	0.24%	-0.24%	0.15	0.39%	-0.10%	0.13	0.10%	-0.16%	0.23
2013-14	3.60%	2.27%	0.01	3.59%	2.38%	0.01	3.23%	2.31%	0.01
2014-15	7.14%	3.38%	0.00	7.03%	3.60%	0.00	6.63%	3.82%	0.00
2015-16	3.07%	0.22%	0.00	2.93%	0.68%	0.00	2.42%	0.80%	0.00
2016-17	4.85%	2.81%	0.00	4.78%	3.07%	0.00	4.78%	3.50%	0.00
2017-18	2.72%	0.75%	0.00	2.82%	1.13%	0.00	2.50%	1.51%	0.01
2018-19	-1.21%	-0.21%	0.01	-1.07%	-0.39%	0.02	-1.15%	-0.33%	0.00

SSP = Small Size's Portfolio; LSP = Large Size's Portfolio

Source: Compiled by authors

Table 2 shows that for all the years, the spread calculated as return on small-sized minus return on large-sized portfolios is positive. Not only that, for most of the years the spread is significant at 5% level except for 2006-07, 2007-08, 2011-12 and 2012-13.

#### **Holding Period-wise Analysis of Returns**

Next, holding period-wise analysis of returns is done for the three sets of the portfolio. Again, for

that, F Test and t-Test are conducted on holding period returns. F test (results not reported here) shows that the *p* values are significant for all the three sets overall different holding periods. As a result, the t-Test is conducted by assuming unequal variance. The results are presented in Table 3.

**Table 3: t-Test of Holding Period-wise Returns Assuming Unequal Variances**

Particulars	Set I (Quartile-based)			Set II (Tercile-based)			Set III (Median-based)		
	Mean Return (SSP)	Mean Return (LSP)	p value	Mean Return (SSP)	Mean Return (LSP)	p value	Mean Return (SSP)	Mean Return (LSP)	p value
<b>1 Year</b>	9.69%	8.13%	0.04	9.64%	8.20%	0.02	9.25%	8.33%	0.05
<b>2 Years</b>	10.01%	6.32%	0.00	9.52%	6.33%	0.00	9.08%	6.70%	0.00
<b>3 Years</b>	9.17%	5.76%	0.00	8.69%	5.77%	0.00	8.25%	6.15%	0.00
<b>4 Years</b>	7.15%	4.39%	0.00	6.75%	4.38%	0.00	6.47%	4.65%	0.00
<b>5 Years</b>	6.39%	4.03%	0.00	5.98%	4.02%	0.00	5.73%	4.15%	0.00
<b>6 Years</b>	4.55%	2.90%	0.00	4.23%	2.83%	0.00	3.98%	2.86%	0.00
<b>7 Years</b>	5.40%	3.58%	0.00	5.13%	3.58%	0.00	4.94%	3.71%	0.00
<b>8 Years</b>	4.95%	3.21%	0.00	4.76%	3.21%	0.00	4.55%	3.33%	0.00
<b>9 Years</b>	4.43%	2.84%	0.00	4.24%	2.83%	0.00	4.02%	2.92%	0.00
<b>10 Years</b>	4.01%	2.53%	0.00	3.86%	2.53%	0.00	3.63%	2.61%	0.00
<b>11 Years</b>	3.97%	2.51%	0.00	3.83%	2.52%	0.00	3.59%	2.58%	0.00
<b>12 Years</b>	4.23%	2.58%	0.00	4.10%	2.61%	0.00	3.84%	2.69%	0.00
<b>13 Years</b>	4.14%	2.40%	0.00	4.01%	2.46%	0.00	3.74%	2.54%	0.00
<b>14 Years</b>	4.20%	2.43%	0.00	4.06%	2.50%	0.00	3.81%	2.61%	0.00
<b>15 Years</b>	4.10%	2.32%	0.00	3.98%	2.41%	0.00	3.72%	2.54%	0.00
<b>16 Years</b>	3.77%	2.16%	0.00	3.67%	2.24%	0.00	3.42%	2.36%	0.00

SSP = Small Size's Portfolio; LSP = Large Size's Portfolio

Source: Compiled by authors

It can be seen from Table 3 that the cumulative returns of the small-sized stock portfolio are consistently and significantly higher than that of the large-sized stock portfolio.

Since the economic theory postulates that return and risk go hand in hand, the above results warrant further investigation to know whether the spread is due to the higher risk associated with small-sized stock portfolios or not. To reiterate, we strongly believe that the economic postulation

of risk-return relationship can be directly and more effectively tested using discriminant analysis, which calls for looking upon size as a categorical dependent variable that divides all the stocks into the two groups of small size vs. large size. To begin with, going by the economic theory, we identify the observed returns and observed risks calculated as variance as explanatory variables for discriminating the two portfolios. Table 4 compiles the results for the holding period of 16 years.

**Table 4: Result of Discriminant Analysis conducted on the factors of return and risk**

Particulars	Criterion	Set I (Quartile-based)	Set II (Tercile-based)	Set III (Median-based)
Mean values of small-sized stocks	Return	3.76	3.66	3.42
	Risk	339.55	323.38	306.37
Mean values of large-sized stocks	Return	2.15	2.24	2.36
	Risk	361.07	320.57	285.06
Standardized Canonical Discriminant Function Coefficients	Return	1.58	1.44	1.29
	Risk	-1.24	-1.04	-0.79
Structure Matrix Coefficients	Return	0.63	0.70	0.79
	Risk	-0.00	0.00	0.02
—		0.42 (p=0.00)	0.49 (p=0.00)	0.67 (p=0.00)
Classification Result (correctly classified)		88.8%	83.2%	75.6%

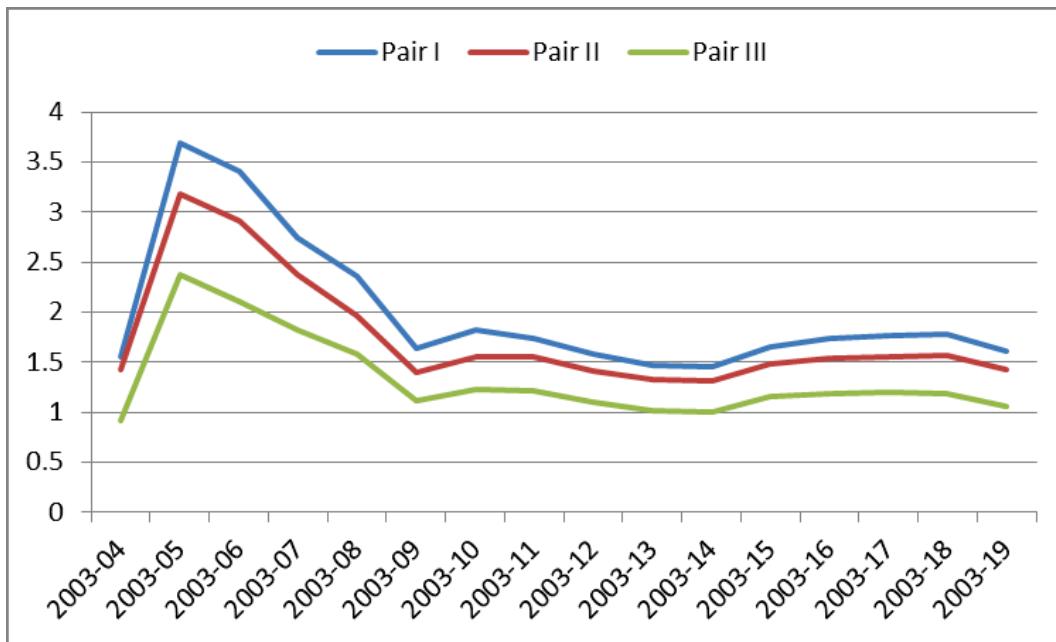
Source: Compiled by authors based on SPSS 21 output

It can be seen from Table 4 that the average return on small-sized stocks, for the period, is higher by 1.06%, 1.42%, and 1.61%, respectively in median-based, tercile-based, and quartile-based portfolios. Likewise, moving from median-based classification to quartile-based classification, the variance is also going hand-in-hand with the increased returns. Thus, the market seems to be supporting the theorised economic relationship between risk and return. Explanation of more than 75% in case of median-based classification and more than 88% in the case of quartile-based classification is no way lesser than the explanations obtained by the band of researchers following the Fama-French methodology. The effectiveness, or call it reliability, of discriminant analysis, is being visibly proven when we look at the percentage of correctly classified cases. The explained percentage is increasing with the classification becoming sharper. Even the trend of decrease in the value of Wilk's Lambda supports this. The structure matrix coefficient suggests that the return correlates the most with the discriminant function. The same gets supplemented by the values of Standardised Canonical Discriminant Function Coefficients for return. Further, quite noticeably, the return has a positive sign, and the risk has a negative sign in sync with the economic theory. Their interpretation is quite obvious that the effect of return gets offset by the effect

of risk. However, even after offsetting for the risk (i.e. in a way discounting for the risk), the return shows up as the discriminating factor in all the three sets. All these observations lead to two clear conclusions, viz. one, that there is clear evidence of size effect in Indian stock market, and two, the discriminant analysis proves to be an excellent and effective technique to investigate such a pricing anomaly.

We also conducted the discriminant analysis for different holding periods, the results of which are not reported here for want of space. By and large, the results are in conformity with the one obtained for sixteen years holding period. In fact, the Wilk's Lambda and classification results are improving with the increase in the holding period. However, we would like to mention here that the signs of return and risk for the holding period of one year are opposite to what is observed for the rest of the holding periods. Rather than interpreting it in the light of the economic theory, we would like to dismiss it as an exception that manifests one year holding period as a gestation period. The results when the holding period is increased by one year (for example, 3-Years) has more explanatory power than that of the previous period (for example, 2-Years) Figure-2 is intuitive in that direction to suggest that the explanatory power would increase with the increase in the holding period.

**Figure 2: Spread for holding period-wise returns**



Based on authors' calculations

### Exploring Additional Sources of Risk

Though the classification result for the holding period of sixteen years obtained using the factors of return and risk is quite satisfactory, we are inclined to explore whether the same can be still increased by adding some other factors. Some other factors that supplement the observed market risk to bridge the void and thereby help reduce the spreads shown in Figure-2. Towards that, we take clues from Fama-French Five-Factor Model, and introduce two additional factors of profitability and investment into our analysis. First, we elaborate on them below.

**Profitability:** Profitability is measured as a ratio of a firm's gross profits (revenues minus cost of goods sold) to its assets. This measure of profitability has approximately the same explanatory power as book-to-market (B/M) for predicting the cross-section of average returns (Novy-Marx, 2013). Many scholars have taken profitability and tried to

understand its impact on return. (For example, see Haugen and Baker, 1996; Xie, 2001; Cohen et al., 2002; Fairfield et al., 2003; Richardson et al., 2006; Chan et al., 2006.)

**Investment:** Investment is measured as the growth of total assets for year  $t$  as total assets at  $t-1$  divided by total assets at  $t-2$ . This measure of investment is economically as well as a statistically significant variable to predict the cross-section of returns (Cooper et al., 2008). The asset growth also captures the complex linkages among returns and different firm size. (For example, see Gray and Johnson, 2011; Yao et al., 2011; Titman et al., 2013; Watanabe et al., 2013; and Wang et al., 2015.)

While adding the factors of profitability and investment to basic factors of return and risk, we left it to the prudence of step-wise discriminant analysis to decide whether they command any additional explanatory power. The results of the step-wise analysis are compiled in Table 5.

**Table 5: Step-wise Discriminant Analysis**

Particulars	Criterion	Set I (Quartile-based)	Set II (Tercile-based)	Set III (Median-based)
Mean values of small-sized stocks	Return	3.76	3.66	3.42
	Risk	339.55	323.38	306.37
	Profitability	0.25	0.26	0.24
	Investment	0.20	0.19	0.18
Mean values of large-sized stocks	Return	2.15	2.24	2.36
	Risk	361.07	320.57	285.06
	Profitability	0.23	0.23	0.22
	Investment	0.15	0.15	0.15
Standardized Canonical Discriminant Function Coefficients	Return	1.65	1.44	1.29
	Risk	-1.30	-1.04	-0.79
	Profitability	-0.23	*	*
Structure Matrix Coefficients	Return	0.61	0.70	0.79
	Risk	-0.01	0.00	0.02
	Profitability	0.06	*	*
Wilk's Lambda		0.41 ( $p=0.00$ )	0.49 ( $p=0.00$ )	0.67 ( $p=0.00$ )
Classification Result (correctly classified)		89.3%	83.2%	75.6%

\*These are null cells. They do not contain any values as the profitability was dropped from the analysis.

Source: Compiled by authors based on SPSS 21 output

It is interesting to note that neither of the two additional factors is retained in case of median-based and tercile-based classifications. However, in the case of quartile based classification, the profitability factor finds its place. Its presence improves the classification result and Wilk's Lambda somewhat.

Obviously, the step-wise process would suggest the optimal combination of factors. However, just out of curiosity, we wondered as to what would happen if we dictate all the four factors. The results (not reported here for want of space) have a lot of educative value. Though the classification result and Wilk's Lambda further improved marginally, the signs of return and risk did not turn out in conformity with the underlying economic theory. Therefore, in order to understand the distortion in results, we looked at the correlation between the classifications made on size and investment. Our suspicion of substantial correlation between the two came true. The correlation coefficient in different sets was about 0.40.

Further, since many scholars examined the value-growth factor along with the size factor under the risk-based view, we also examined the effect of the value-growth factor. Defining it on the basis of the Price-to-Book value ratio, we added it to the list of explanatory factors. Again, the results (not reported here) are very similar to what we found previously with four factors. That is, the classification result and Wilk's Lambda improved marginally, but the signs got distorted. Again, when we calculated the correlation coefficient between the classifications made on size and value-growth, it turned out to be as high as 0.74 to 0.87 in different sets. One very important point emerges out of these two experiments that internally correlated factors distort the results. Therefore, instead of looking at classification results and Wilk's Lambda, the focus should be more on the desired economic relationship. Interestingly, the step-wise process does the job effectively.

### **Discussion and Conclusions**

Size premium is one of the extensively researched topics in capital market studies. Most of the studies in developed economies as well as in emerging economies like India examine the size effect as one of the sources/factors of risks (along with other sources like the value effect, profitability effect, investment effect, momentum effect, etc.) over and above the market risk as stipulated under the CAPM. The popular approach for examining the size effect is pioneered by Fama-French that identifies the size as one of the

explanatory factors and runs regressions for assessing a cross-section of returns. It requires to construct many different portfolios so that the effect of a particular factor can be inferred while controlling the effects of other factors. It is premised on the EMH, and equates the realised return with the expected return. Under this approach, if the size effect turns out to be significant, then it is concluded that the market perceives more risk with the small-sizes stocks in comparison to the large-sized stocks. This approach is also labelled as 'risk-based view' or 'risk-based hypothesis'. The overriding assumption of this approach is that the market is efficient, so if the small-sized stocks exhibited low valuations, and thereby commanded higher return, then they must have been coupled with the higher risk. However, such an approach rightfully attracts harsh criticism. John H. Cochrane (2011), who in his presidential address to the American Finance Association in 2011 justifiably made some serious comments on the risk-based view while discussing the scenario of discount rates. He exclaimed over the twist with which the real issue of asset pricing got deflated into one of determining the expected returns. Discussing the issue of value anomaly, he strongly asserted that the Market-to-Book ratios should be the left-hand side (i.e. explained) variable, rather than the factor to be employed on the right-hand side (i.e. explanatory variable) for classifying the expected returns. It is obvious that this observation is not specific only to the value premium; rather, it is pointing out the methodological ploy, which is equally applicable to any type of premium, including the size premium. Such a methodological ploy has serious aftermath of ending up explaining the Y with the Y, rather than with the X! There is one more catch with this methodology. If there are any interdependencies among the explanatory factors, the results will get distorted. That is, depending upon the choice of the market and/or time period of the study, the model will ratify one of the two interdependent factors as a significant one, and drop out the other factor as irrelevant or insignificant one. In conclusion, this approach indirectly infers about the existence or otherwise of the size premium, taking a coloured view of the market.

Therefore, for examining the size effect, we opt for exploring a method which is free from such a trap, and can explain the Y with the X. Accordingly, we have chosen to keep the size premium as a left-hand item, and the return, the observed market risk and other potential sources of extra risk as right-hand variables by resorting to Discriminant Analysis. However, before taking that route, we satisfied

ourselves using t-Test that the small-sized stocks had significantly higher returns than the large-sized stocks over the entire holding period of sixteen years. Then, we embarked on applying the Discriminant Analysis, where the stocks were bifurcated into two categories of small vs large based on their market capitalisation on 31st March 2003. Initially, the basic economic factors of return and risk were chosen to see how far they explain the two categories. Our results uphold the economic relationship between the return and the risk by assigning a positive sign to the return factor and negative sign to the risk factor. In the parlance of Discriminant Analysis, the factor with negative sign reduces the impact of the one with a positive sign. Further, the factor with the highest value loading is held as the most influential factor so far as the discrimination is concerned. Thus, the return turns out to be the differentiator. Of course, the impact of return is reduced by the risk factor, but even after that reduction, the classification is explained to the tune of 76% to 89% for the different sets of portfolios. The interpretation of this result is quite obvious that there is an excess return on the small-sized stocks which is not explained (or say, countered) by the associated risk. Thus, the results are unequivocally in favour of recognising the size effect as the 'size anomaly', and no way for labelling it as the 'size premium'. Additionally, the prudence for using the Discriminant Analysis is also validated by the results. The classification results and Wilk's Lambda improved when we moved away from the median-based classification (i.e. Set-III) to a sharper classification based on quartiles (i.e. Set-I). Next, we incorporated other two sources of risk, viz. the profitability differentials and the investment differentials that are being conceptualised recently by many scholars as potentially capable of bridging the gap that existed under the Fama-French method even after applying the factors of size and value. However, the step-wise process under the Discriminant Analysis did not ratify the investment factor in any of the three sets. Of course, profitability was recognised as a factor only for Set-I (i.e. quartile-based categorisation). However, in our case, its presence did not increase the incidence of risk, rather it carved out space for itself by encroaching upon the return.

Our results are different from most of the studies conducted on the Indian market that examined the size premium, taking the direct approach of analysis using the tools of Sharpe Ratio, ANOVA, etc. Likewise, we differ from Agarwalla et al. (2017), too, who, by taking the indirect approach as per

the risk-based view, did not find the size factor responsible for explaining the excess return. However, our results are in conformity with the findings of many studies conducted in developed countries. Of course, they are based on the Fama-French approach. Nonetheless, though our results are similar to theirs, there is a marked difference in the conclusions to be drawn. Under the risk-based view, the existence of the size effect is labelled as 'size premium', whereas the same as per our approach gets designated as 'size anomaly'. To that extent, our findings are in sync with that of Agarwalla et al. (2017). Their momentum effect can be taken as a proxy of behavioural influences that are not captured under the EMH. Our Figure-2, in a way, can be interpreted as supporting the momentum effect. We suspect that there may be interdependences between the momentum factor and the size factor, and the former may have overridden the latter in their study.

Our study also contributes to the methodological aspect. It successfully deploys Discriminant Analysis and shows that the results attained with it can be more conclusive. We would like to note here that the Discriminant Analysis can be used for two purposes: (i) supporting the classifications developed on a-priori basis, and (ii) building a discriminant function that can help in assigning individual observations to a particular class. As can be seen in our work, we have used it only for the first purpose, i.e. as a scientific test for supporting three sets of portfolios that we created based on price-to-book value ratio. Obviously, the prediction of class membership is not our objective; hence, we do not build the Z-score model.

#### **Future Scope: Leveraging on our results to search for a possible resolution of the debate**

As shown above, as far as the characterisation of the market is concerned, going by the existing constructs, our observations cast their vote in favour of behavioural finance rather than EMH. The results preferred to label the size effect as 'size anomaly', and not the 'size premium'. So far, so good! However, whatever be the lens to look at it, the fact remains that the size effect is persistent over such a long holding period. In fact, we are also convinced that the evidence of higher returns persistent over such a long period cannot be dismissed under the pretext of any level of aberration in the market. There cannot be anything that would prevent arbitrage operations for such a long period.

Then, what can reconcile the seemingly opposite observations?

Therefore, disregarding the existing construct, we want to put forward two new perspectives, as discussed below.

### **A New Perspective on the Characterization of the Capital Market**

Though the behavioural paradigm is being increasingly considered as an alternative view to look at the issues that cannot be explained satisfactorily by the EMH, we firmly believe that a phenomenon like size effect that persists over such a long period of time should be labelled as an anomaly. Behavioural aspects may create distortions in attaining equilibrium over a short period of time only. Therefore, we need to differentiate between short-lived and long-lived phenomena. Short-lived ones like momentum effect, January effect, etc. can be examined using the behavioural lens. However, long-lived phenomena like size effect, value effect must be accepted as realities, because any aberration in a market cannot persist for years together. Therefore, we need to search for bridging the gap between the size anomaly and size premium as well as between the value anomaly and value premium. We are convinced that we can make a breakthrough in that direction by looking at the risk from a different lens, as elaborated below.

### **A New Perspective on Looking at Risk**

It is customary to measure risk in financial analysis using the second moment of the probability distribution. We have also followed suit. But there is a larger question of whether the variance in itself represents the incidence of risk, or it is only a proxy of some broader parameter of concern to the investor? Let us get clues out of Sharpe (1991) to answer this question. After 25 years of presenting CAPM, in this paper, he brings into the analysis utility function of the investors and moves forward on the postulation that investor seeks to maximise the utility of her investment. Towards that, the expected return contributes positively, and the variance negatively in terms of his concept of 'risk penalty'. In this sense, the variance does not continue to remain as a parameter of interest; rather it subsumes into a more relevant parameter of utility. Given this, a higher risk on small-sizes stocks means still much higher penalty on utility for rational investors. Therefore, the statistical parameter of risk may not be explaining the higher return on small-sized stocks, but its implication in terms of reduction in the utility does throw open the possibility of ensuring the risk-return

equilibrium. Notably, our approach of comparing the return and risk separately, rather than going for its composite measure like Sharpe ratio, paves the way for it. As we noted earlier, the higher return on small-sized stocks was coupled with higher risk across the three sets of portfolios. In fact, the incidence of risk is increasing with the increase in the sharpness of the classification (i.e. moving from Set-III to Set-I). We think that this finding can be used equally for resolving the debate!

In our view, further developments on this line can help reconcile the seeming differences between the research findings covered under the 'risk-based view' (i.e. Part-I) and Part-II. In conclusion, looking at the risk parameter in terms of its implication on the utility function of investor can free the Fama-French approach from the allegation of equating 'identification of risk' with 'ratification of risk'. Likewise, transforming risk into utility will also help resolve the value debate. Not only that but more fundamentally, it will further substantiate the rational expectations theory that envisages creating an identity between the realised returns and the expected returns.

### **References**

- Agarwalla, Sobhesh Kumar, et al. "Size, value, and momentum in Indian equities." *VIKALPA* 42.4 (2017): 211-219.
- Akhtar, Samreen, et al. "Size, value, momentum, and liquidity effects in Indian stock." *International Journal of Money, Banking & Finance* 6.1 (2017): 34-39.
- Amel-Zadeh, Amir. "The return of the size anomaly: Evidence from the German stock market." *European Financial Management* 17.1 (2011): 145-182.
- Ammann, Manuel and Michael Steiner. "Risk factors for the Swiss stock market." *Swiss Journal of Economics and Statistics* 144.1 (2008): 1-35.
- Arbel, Avner, Steven Carvell and Paul Strelbel. "Giraffes, institutions and neglected firms." *Financial Analysts Journal* 39.3 (1983): 57-63.
- Balakrishnan, A. "Size, value, and momentum effects in stock returns: Evidence from India." *Vision* 20.1 (2016): 1-8.
- Ball, Ray. "Anomalies in relationships between securities' yields and yield-surrogates." *Journal of Financial Economics* 6.2-3 (1978): 103-126.

- Banz, Rolf W. "The relationship between return and market value of common stocks." *Journal of Financial Economics* 9.1 (1981): 3-18.
- Barberis, Nicholas, et al. "A model of investor sentiment." *Journal of Financial Economics* 49.3 (1998): 307-343.
- Bauer, Rob, et al. "Conditional asset pricing and stock market anomalies in Europe." *European Financial Management* 16.2 (2010): 165-190.
- Berk, Jonathan B. "A critique of size-related anomalies." *The Review of Financial Studies* 8.2 (1995): 275-286.
- Blume, Lawrence E. and Steven N. Durlauf, *The new palgrave dictionary of economics*. London: Macmillan Publishers Ltd., 2008.
- Brailsford, Tim, Clive Gaunt and Michael A O'Brien. "Size and book-to-market factors in Australia." *Australian Journal of Management* 37.2 (2011): 261-281.
- Cakici, Nusret, Yi Tang and An Yan. "Do the size, value, and momentum factors drive stock returns in emerging markets?" *Journal of International Money and Finance* 69 (2016): 179-204.
- Carhart, Mark M. "On persistence in mutual fund performance." *The Journal of Finance* 52.1 (1997): 57-82.
- Chan, Konan, et al. "Earnings quality and stock returns." *The Journal of Business* 79 (2006): 1041-1082.
- Chou, Pin-Huang, et al. "Do macroeconomic factors subsume market anomalies in long investment horizons?" *Managerial Finance* 33.8 (2007): 534-552.
- Cochrane, John H. "Presidential address: Discount rates." *The Journal of Finance* 66.4 (2011): 1047-1108.
- Cohen, Randolph B., Paul A. Gompers and Tuomo Vuolteenaho. "Who underreacts to cash-flow news? Evidence from trading between individuals and institutions." *Journal of Financial Economics* 66.2-3 (2002): 409-462.
- Cook, Thomas J. and Michael S. Rozeff. "Size and earnings/price ratio anomalies: One effect or two?" *The Journal of Financial and Quantitative Analysis* 19.4 (1984): 449-466.
- Cooper, Michael J., Huseyin Gulen and Michael J. Schill. "Asset growth and the cross-section of stock returns." *The Journal of Finance* 63.4 (2008): 1610-1651.
- Daniel, Kent, David Hirshleifer and Avanidhar Subrahmanyam. "Investor psychology and security market under and overreactions." *The Journal of Finance* 53.6 (1998): 1839-1885.
- Easterday, Kathryn E., et al. "The persistence of the small firm/January effect: Is it consistent with investors' learning and arbitrage efforts?" *The Quarterly Review of Economics and Finance* 49.3 (2009): 1172-1193.
- Fairfield, Patricia M. J. et al. "Accrued earnings and growth: Implications for future profitability and market mispricing." *The Accounting Review* 78.1 (2003): 353-371.
- Fama, Eugene F. and Kenneth R. French. "A five-factor asset pricing model." *Journal of Financial Economics* 116.1 (2015): 1-22.
- . "Common risk factors in the returns on stocks and bonds." *Journal of Financial Economics* 33.1 (1993): 3-56.
  - . "Size and book-to-market factors in earnings and returns." *The Journal of Finance* 50.1 (1995): 131-155.
  - . "The cross-section of expected stock returns." *The Journal of Finance* 47.2 (1992): 427-465.
- Fama, Eugene F. "Efficient capital markets: A review of theory and empirical work." *The Journal of Finance* 25.2 (1970): 383-417.
- Garza-Gómez, Xavier, et al. "Does size really matter in Japan?" *Financial Analysts Journal* 54.6 (1998): 22-34.
- Gray, Philip and Jessica Johnson. "The relationship between asset growth and the cross-section of stock returns." *Journal of Banking and Finance* 35.3 (2011): 670-680.
- Hanauer, Matthias X. and Martin Linhart. "Size, value, and momentum in emerging market stock returns: Integrated or segmented pricing?" *Asia-Pacific Journal of Financial Studies* 44.2 (2015): 175-214.

- Harshita, Shveta Singh and Surendra S. Yadav. "Size effect in Indian stock market; An anomaly or a methodological artifact." *Journal of Financial Management and Analysis* 31.1 (2018): 71-81.
- Haugen, Robert A. and Nardin L. Baker. "Commonality in the determinants of expected stock returns." *Journal of Financial Economics* 41.3 (1996): 401-439.
- Hendricks, Darryll, et al. "Hot hands in mutual funds: Short-run persistence of relative performance, 1974-1988." *The Journal of Finance* 48.1 (1993): 93-130.
- Heston, Steven L., K. et al. "The role of beta and size in the cross-section of European stock returns." *European Financial Management* 5.1 (1999): 9-27.
- Hong, Harrison and Jeremy C. Stein. "A unified theory of underreaction, momentum trading, and overreaction in asset markets." *The Journal of Finance* 54.6 (1999): 2143-2184.
- Hussaini, Mussa. "Size and value in the stock exchange of Thailand." *Journal of Financial Risk Management* 5.1 (2016): 14-21.
- Jegadeesh, Narasimhan and Sheridan Titman. "Returns to buying winners and selling losers: Implications for stock market efficiency." *The Journal of Finance* 48.1 (1993): 65-91.
- Leite, André Luis, et al. "Size, value, profitability, and investment: Evidence from emerging markets." *Emerging Markets Review* 36 (2018): 45-59.
- Leledakis, George, Ian Davidson and George Karathanassis. "Cross-sectional estimation of stock returns in small markets: The case of the Athens stock exchange." *Applied Financial Economics* 13.6 (2003): 413-426.
- Lintner, John. "Security prices, risk, and maximal gains from diversification." *The Journal of Finance* 20.4 (1965): 587-615.
- Lischewski, Judith and Svitlana Voronkova. "Size, value and liquidity. Do they really matter on an emerging stock market?" *Emerging Markets Review* 13.1 (2012): 8-25.
- Mohanty, Pitabas. "Evidence of size effect on stock returns in India." *Vikalpa* 27.3 (2002): 27-38.
- Novy-Marx, Robert. "The other side of value: The gross profitability premium." *Journal of Financial Economics* 108.1 (2013): 1-28.
- Patel, Jayen B. "A further analysis of small firm stock returns." *Managerial Finance* 38.7 (2012): 653-659.
- Perez, Gerardo Gerry Alfonso. "Company size effect in the stock market of Thailand." *International Journal of Financial Research* 8.3 (2017): 105-110.
- Reinganum, Marc R. "Misspecification of capital asset pricing: Empirical anomalies based on earnings' yields and market values." *Journal of Financial Economics* 9.1 (1981): 19-46.
- Richardson, Scott A., et al. "The implications of accounting distortions and growth for accruals and profitability." *The Accounting Review* 81.3 (2006): 713-743.
- Schrimpf, Andreas, Michael Schröder and Richard Stehle. "Cross-sectional tests of conditional asset pricing models: evidence from the German stock market." *European Financial Management* 13.5 (2007): 880-907.
- Sehgal, Sanjay and Vanita Tripathi. "Size effect in Indian stock market: Some empirical evidence." *Vision* 9.4 (2005): 27-42.
- Sehgal, Sanjay, et al. "A search for rational sources of stock return anomalies: Evidence from India." *International Journal of Economics and Finance* 4.4 (2012): 121-134.
- Sharpe, William F. "Capital asset prices: A theory of market equilibrium under conditions of risk." *The Journal of Finance* 19.3 (1964): 425-442.
- Sharpe, William F. "Capital asset prices with and without negative holdings." *The Journal of Finance* 46.2 (1991): 489-509.
- Shleifer, Andrei and Robert W. Vishny. "The limits of arbitrage." *The Journal of Finance* 52.1 (1997): 35-55.

- Steiner, Michael. "Predicting premiums for the market, size, value, and momentum factors." *Financial Markets and Portfolio Management* 23.2 (2009): 137-155.
- Tauscher, Kathrin and Martin Wallmeier. "Portfolio overlapping bias in tests of the Fama–French three-factor model." *European Financial Management* 22.3 (2016): 367-393.
- Titman, Sheridan, et al. "Market development and the asset growth effect: International evidence." *Journal of Financial and Quantitative Analysis* 48.5 (2013): 1405-1432.
- Wang, Yifeng, et al. "The relation between asset growth and the cross-section of stock returns: Evidence from the Chinese stock market." *Economic Modelling* 44 (2015): 59-67.
- Watanabe, Akiko, et al. "The asset growth effect: Insights from international equity markets." *Journal of Financial Economics* 108.2 (2013): 529-563.
- Xie, Shiqing and Qiuying Qu. "The three-factor model and size and value premiums in China's stock market." *Emerging Markets Finance and Trade* 52.5 (2016): 1092-1105.
- Yao, Tong, et al. "Asset growth and stock returns: Evidence from Asian financial markets." *Pacific Basin Finance Journal* 19.1 (2011): 115-139.
- Zhong, Angel, Manapon Limkriangkrai and Philip Gray. "Anomalies, risk adjustment and seasonality: Australian evidence." *International Review of Financial Analysis* 35 (2014): 207-218.

\*\*\*\*\*

## **SCMS JOURNAL OF INDIAN MANAGEMENT**

SCMS New Campus, Prathap Nagar  
 Muttom, Aluva-683 106, Kochi, Kerala, India  
 Ph: 91-484-262 3803 / 262 3804 / 262 3885 / 262 3887 Fax: 91-484-262 3855  
 E-mail: editor@scmsgroup.org  
 Website: www.scms.edu.in/journal

### **Aims and Scope**

The *SCMS Journal of Indian Management* is a blind peer-reviewed Journal. The Journal deems it its mission to submit to the readers fresh fruit of management thoughts and rich cream of current innovative research. The format of the Journal is designed reader-friendly. The academia and the corporates have an easy access to the Journal.

The Journal looks for articles conceptually sound, at once methodologically rigorous. The Journal loves to deal knowledge in management theory and practice individually and in unison. We wish our effort would bear fruit. We hope the Journal will have a long life in the shelves catering to the needs of b-students and b-faculty.

- ◆ Proposals for articles that demonstrate clear and bold thinking, fresh and useful ideas, accessible and jargon-free expression, and unambiguous authority are invited. The following may be noted while articles are prepared.
- ◆ What is the central message of the article you propose to write? Moreover, what is new, useful, counterintuitive, or important about your idea?
- ◆ What are the real-world implications of the proposed article? Can the central message be applied in businesses today, and if so, how?
- ◆ Who is the audience for your article? Why should a busy manager stop and read it?
- ◆ What kind of research have you conducted to support the argument or logic in your article?
- ◆ What academic, professional, or personal experience will you draw on to make the argument convincing? In other words, what is the source of your authority?
- ◆ The manuscript of reasonable length shall be sent to the Editor—*SCMS Journal of India Management* (Both for postal and electronic submission details are given here under).

### **The manuscript should accompany the following separately:**

- ◆ An abstract (about 100 words), a brief biographical sketch of above 100 words for authors describing designation, affiliation, specialization, number of books and articles published in the referee journals, membership on editorial boards and companies etc.
- ◆ The declaration to the effect that the work is original and it has not been published earlier shall be sent.
- ◆ Tables, charts and graphs should be typed in separate sheets. They should be numbered as Table 1, Graph 1 etc.
- ◆ References used should be listed at the end of the text.
- ◆ Editors reserve the right to modify and improve the manuscripts to meet the Journal's standards of presentation and style.
- ◆ Editors have full right to accept or reject an article for publication. Editorial decisions will be communicated with in a period of four weeks of the receipt of the manuscripts.
- ◆ All footnotes will be appended at the end of the article as a separate page. The typo script should use smaller size fonts.
- ◆ An Author/Co-author shall submit only one article at a time for consideration of publication in the Journal. The author/co-author can send another article only on hearing from the editor whether it is accepted / rejected.
- ◆ The author getting one article published in the Journal has to wait for a year to get another published

### **Submit the manuscript to:**

editor@scmsgroup.org

The submission must be in the form of an attachment with a covering letter to be sent as e-mail.

## SCMS JOURNAL OF INDIAN MANAGEMENT

SCMS New Campus, Prathap Nagar  
Muttom, Aluva-683 106, Kochi, Kerala, India  
Ph: 91-484-262 3803 / 262 3804 / 262 3885 / 262 3887 Fax: 91-484-262 3855  
E-mail: editor@scmsgroup.org  
Website: [www.scms.edu.in/journal](http://www.scms.edu.in/journal)

### Ethical Guidelines for Authors

The Author shall present an accurate and complete account of the research performed. The corresponding author must have obtained the approval of all other authors for each submission. Ghost authors are not permitted. The material in the submission shall be original. The material based on prior work, including that of the same author/s shall be properly attributed by proper citation. The author shall have the obligation to notify the editor immediately should any one of the statements in this list ceases to be true.

### Ethical Guidelines for Peer Reviewers

The Peer reviewer shall review manuscripts for which they have the subject expertise required to carry out a proper assessment. Peer reviewers shall respect the confidentiality of peer review and shall not reveal any details of the manuscript under review and of its review. Peer reviewers shall be objective and constructive in their reviews.

### Ethical Guidelines for the Editor

The Editor shall actively seek the views of authors, readers, reviewers, and editorial board members about ways of improving the journal's success. The Editor shall support initiatives designed to reduce academic misconduct. The Editor shall support initiatives to educate researchers about publication ethics. The Editor shall provide clear advice to reviewers. The Editor shall require reviewers to disclose any potential competing interests before agreeing to review a submission. The Editor shall encourage reviewers to comment on ethical questions and possible research misconduct raised by submissions.

The Journal abides by the The Best Practices Guidelines of the COPE COMMITTEE ON PUBLICATION ETHICS for Editors, Authors, and Peer Reviewers.

© SCMS Journal of Indian Management, SCMS New Campus, Prathap Nagar, Muttom, Aluva-683106, Kochi, Kerala, India

Ph: 91-484-262 3803 / 262 3804 / 262 3885 / 262 3887 Fax: 91-484-262 3855, Website: [www.scms.edu.in](http://www.scms.edu.in)  
E-mail: editor@scmsgroup.org Journal Website : [www.scms.edu.in/journal](http://www.scms.edu.in/journal)

All rights reserved. No part of this publication may be reproduced in any form without the written consent of the publisher. School of Communication and Management Studies and SCMS Journal of Indian Management assume no responsibility for the views expressed or information furnished by the authors. Edited and published by the Editor for and on behalf of SCMS and printed at Maptho Paintings, Cochin-683104.

## **SCMS Journal of Indian Management Subscription Form**

Name : \_\_\_\_\_

Address : \_\_\_\_\_

City : \_\_\_\_\_

Zip Code : \_\_\_\_\_

Country : \_\_\_\_\_

E-mail : \_\_\_\_\_

Phone : \_\_\_\_\_

Draft Number : \_\_\_\_\_

DD in favour of SCMS  
payable at Cochin

<b>Subscription Rates</b>	<b>1 Year</b>	<b>2 Years</b>	<b>Per Issue</b>
	<b>2000 (\$100)</b>	<b>3600 (\$150)</b>	<b>500 (\$30)</b>

### **Payment Details :**

Please find below our bank details. You can transfer the subscription and report.

Bank Name : State Bank of India, Kalamassery

A/c No : 30090816337

IFSC Code : SBIN0010110

Account Name : School of Communication and Management Studies.

Mail the bank transfer details and mailing address to editor@scmsgroup.org

### **For all communications contact :**

Editor, SCMS Journal of Indian Management,  
SCMS New Campus, Prathap Nagar,  
Muttom, Aluva - 683106, Kochi, Kerala, India.

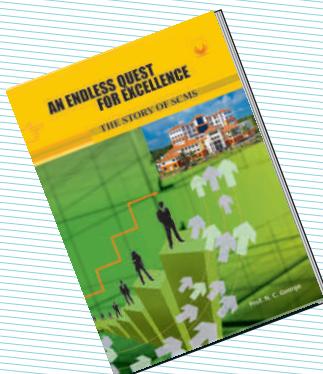
Phone: 91-484-262 3803 / 262 3804 / 262 3885 / 262 3887

Fax: 91-484-262 3855

Website: [www.scms.edu.in](http://www.scms.edu.in) , E-mail: editor@scmsgroup.org



Story of an entrepreneur who built up a set of high quality academic institutions in a totally hostile and challenging environment. A model for entrepreneurship in any situation.



By Prof. N.C. George  
Price ₹ 895/-

Copies can be had from the Publication Department, SCMS Group of Educational Institutions, Cochin-683106.

Edited, printed and published by Dr. Radha Thevanoor on behalf of SCMS COCHIN SCHOOL OF BUSINESS and printed at Maptho Printings, Kalamassery, Cochin-683104 and published at Muttom, Aluva-683106, Cochin.



## PGDM OF SCMS COCHIN SCHOOL OF BUSINESS

**ACBSP (US)  
ACCREDITED  
B. SCHOOL**

**SCMS COCHIN  
SCHOOL OF BUSINESS**  
**-The first  
accredited, AIU  
recognized and  
ISO certified  
business school in  
Southern India**

- ◆ Recognized as equivalent to MBA by the Association of Indian Universities (AIU).
- ◆ Centrally air-conditioned world-class campus, an excellent team of 56 full time faculty, well-stocked library, full-fledged computer centre, superior teaching aids etc.
- ◆ Academic tie-ups with Foreign Universities to give the programme global focus and innovation. Nine faculty members from the universities of USA, Australia & Switzerland teaching full course at SCMS. Cochin School of Business
- ◆ Dewang Mehta National Award for excellence in leadership training systems
- ◆ Impact Marketing National Award for integration of exceptional communication skill development system
- ◆ The only recipient of a grant for track record in performance from AICTE
- ◆ Ranking within the first 25 B.Schools in the A++ category
- ◆ Only B.School which has a University approved Research Centre for PhD in Management
- ◆ Only B.School in India to establish a Chair for Climate Change
- ◆ SCMS-Cochin School of Business is now one of the seven ACBSP (US) accredited B-Schools in India.

For information, please visit our website <[www.scms.edu.in](http://www.scms.edu.in)>



# SCMS COCHIN SCHOOL OF BUSINESS

PRATHAP NAGAR, MUTTOM, ALWAYE, COCHIN-683106, KERALA, Ph: 0484 - 2623803/04, 2623885/87, Fax: 0484-2623855

Email: [editor@scmsgroup.org](mailto:editor@scmsgroup.org), Website: <[www.scmsgroup.org](http://www.scmsgroup.org)>

Journal Website: <[www.scms.edu.in/journal](http://www.scms.edu.in/journal)>

ISSN-0973-3167

