Estimation of Modern Times Phillips Curve: USA and India
Bansi Sawhney, Kishore G. Kulkarni, and Nicolas Cachonosky

Impact of Dividend Policy During the Global Economic Recession: Automobile Industries in India
N. S. Pandey and S. Devi Narayani

Liquidity Risk and Credit Risk: Impact on Banks
Gurpeet Kaur and Renuka Sharma

Modeling Dynamic Communications Between Financial Development Trade & Growth: Mint Economy
Madhumita Guha Majumder, Nithya Ramalingam, and P. Janaki Ramudu

Competition Stability or Fragility?: Empirical Evidence from Indian Banking Sector
Santi Gpoal Maji and Preeti Hazarika

Personalization Phenom: User-centric Perspectives towards Recommendation Systems in Indian Video Services
Sivamol S and Kalyani Suresh

Health Consciousness as an Enabler for Exploratory Buying Behavior among Consumers
Sapna Parashar, Yogesh Mungra and Gunjan Sood

Anil Khurana and V V Ravi Kumar

Measuring the Business Performance: Sole Proprietors in Puducherry
Sankar R.
Articles

5 Estimation of Modern Times Phillips Curve: USA and India
Bansi Sawhney, Kishore G. Kulkarni, and Nicolas Cachonosky

18 Impact of Dividend Policy During the Global Economic Recession: Automobile Industries in India
N. S. Pandey and S. Devi Narayani

30 Liquidity Risk and Credit Risk: Impact on Banks
Gurpeet Kaur and Renuka Sharma

43 Modeling Dynamic Communications Between Financial Development Trade & Growth: Mint Economy
Madhumita Guha Majumder, Nithya Ramalingam, and P. Janaki Ramudu

54 Competition Stability or Fragility?: Empirical Evidence from Indian Banking Sector
Santi Gpooal Maji and Preeti Hazarika

73 Personalization Phenom: User-centric Perspectives towards Recommendation Systems in Indian Video Services
Sivamol S and Kalyani Suresh

87 Health Consciousness as an Enabler for Exploratory Buying Behavior among Consumers
Sapna Parashar, Yogesh Mungra and Gunjan Sood

Anil Khurana and V V Ravi Kumar

118 Measuring the Business Performance: Sole Proprietors in Puducherry
Sankar R.
Chairman’s Overview

The two most important macroeconomic objectives of every country, whether advanced or less developed, are higher growth and low inflation. Economic policies are formulated and executed by the governments with this purpose in view. But somehow or other not all the countries have been successful in their attempt in achieving either of these objectives.

Many economists believe that Phillips curve is a very useful relationship because inflation and unemployment are key measures of economic performance. The trade-off between inflation and unemployment led economists to use the Phillips curve to fine-tune monetary fiscal policy. Our lead article in this issue is a study that tests whether the Phillips curve can provide guidance to the policymakers in developing countries such as India.

Dividend decision of the company is an important issue to be determined by the financial managers and dividend is the key indicator of the market share price and firm's value. The dividend policy determines what proportion of earnings is paid to the shareholders by the way of dividends and what portion is ploughed back to the firm for reinvestment purpose that is retained as earnings. Our second lead article is a study on the impact of dividend policy on share price in the automobile sector in India.

Our third lead article is an attempt towards the formulation of joint risk management policy for curbing liquidity risk and credit risk.

We also feature in this issue a number of learned articles on a range of topics such as Modeling Dynamic Communications, Competition Stability, Personalisation Phenom, Health Consciousness, Customer Satisfaction, Brand Personality 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.
The boss speaks on management. The boss may be Jack Welch or Steve Balmer or anyone else. Tom Peters edits and publishes all that is spoken by them in a book *Boss Talk*, where bosses tell, to our surprise, only earthy earthy things.

“Mundane” is common sense. “Inspiring” is uncommon sense. They brighten the world of bosses’ words.

Jack Welch of General Electric did better than everyone else during the last century. Despite that, he tells of his secret as no secret. Though the size of GE is astonishing, his executives think of themselves as running a grocery store. They will instinctively make the correct decisions if they focus on the basics of people and customers, and service and innovation. Is it that simple? What Jack means is simple: One has to focus on or shall have obsession with the basics, within the context of the particular enterprise. For him a company is a place of ideas. It is not a place of positions. As any business matures, it runs into problems of hierarchy. Jack Welch speaks on motivation: “tell people to never allow themselves to become victims…They should go somewhere else if that’s how they feel.” “Promote your best performers and weed out your worst. “Challenge them to give every growth idea they’ve got.” “You can’t just reward with trophies. Reward them in the wallet, too”

Steve Ballmer was Microsoft MD. He was also a spokesman of simplicity. Clear thought and leading proposition are the terms he uses. A few things he has to focus on: You make sure that that you have great people. You have to rededicate yourselves to these great people. You have to refocus on clear, simple goals. The principles we talk about will not change, the value we uphold will never change. Goals are things that change.

Rebecca Buckman in *The Wall Street Journal* comments: Steve Ballmer’s dictum is “Simplify Goals, Heed Key Employees' Concerns.”

---

Dr. D. Radhakrishnan Nair
In early 2000s, the economic growth has accompanied by very high rates of inflation in India. In fact high inflation has caused high income inequality and the poor are suffering the most. It is high time that economists develop a new theory to address this problem. Is the Phillips curve relevant in India?

This paper tests whether the Phillips curve is alive and can provide guidance to the policy makers in developing countries such as India therefore, a new and extended version of the relationship is explored. More specifically the variables used need to be refined. In this study we use different measures of Inflation and unemployment; second, the econometric equations on output gap also incorporate the lagged variable and third, a supply-shock variable is introduced. Our preliminary finding suggests that this supply-induced Phillips curve explains the trade-off better which can help the policy makers reduce inflation while maintaining high rates of economic growth in India.

**Keywords:** Phillips Curve, India, USA macroeconomic performance
For macroeconomists, the recent developments in relationship between inflation and unemployment rates have made it necessary to re-visit the existence of the Phillips curve as the policies have turned more Keynesian thanks to the exercise in US and also in some ways in India to raise the government expenditure and money supply to influence the economic growth and control inflation. The discovery of the trade-off by A.W. Phillips in 1958, in a seminal paper, has led to investigate the possible explanations of the trade-off. The literature is full of Phillips Curve estimation since 1960s as hundreds of papers have been published using data of inflation and unemployment in various countries and over different periods of time. While past research has clarified some theoretical as well as empirical issues, much remains to be done, as the most recent experience in US and other countries such as India contradicts the Phillips curve's hypothesis and the findings. Several countries have witnessed growth without inflation. In fact, some studies have found an upward sloping Phillips curve phenomenon, which is aptly termed as stagflation.

Macroeconomic theorists lost much of the interest in Phillips Curve in 1990s and many countries, particularly since 2000-01, have experienced high growth with low inflation. Some have even declared that the Phillips Curve is dead and suggested that anymore discussion of the Phillips Curve is unwarranted. However, recent experiences of US economy since 2009 and of India since 1990 have created renewed curiosity in the Phillips Curve. The present paper investigates the actual trade-off between inflation rate and unemployment rate for the modern times for these two economies, and tries to find possible theoretical arguments for the existence of the trade-off. Section 1 discusses the renewed interest in Phillips Curve ideology and theoretical developments that made the original Phillips Curve so famous. In Section 2, paper uses data for India and the US to estimate the Phillips Curve trade-off and further examines the rebirth of it. Section 3 makes the summary and conclusion.

Section 1: Renewed Interest in the Phillips Curve:
Fed Chair Janet Yellen raised her concern and said in September 2016 that "a labor market moving toward full employment is one that historically has generated upward pressure on inflation. So that bolsters my confidence in inflation."

'Alive and Well'
At Goldman Sachs Group Inc., economist David Mericle is leaning Yellen's way and says the Phillips curve seems "alive and well" in US and across the world's richest economies even though inflation falls short of central bank targets in most countries.

Mericle's review of data from member countries of the Organization for Economic Cooperation and Development showed that unemployment rates still have a "statistically significant" effect on both wage growth and inflation in a majority of the countries, even if only the last five years were monitored. The most convincing attempt to revitalize the Phillips Curve came from Fuhrer (1995) who said that "Rumors of the death of the Phillips Curve appear to have been greatly exaggerated. In fact the Phillips Curve is alive and well, and living in a good number of (although certainly not all) widely used macro-econometric models." He further goes on to claim that the "The primary reason for its (the Phillips Curve's) longevity is that in contrast to the common perception he Phillips Curve has been an extremely robust empirical relationship as macroeconomists have ever had at their disposal"

While Fuhrer puts forward a very optimistic view about the Phillips Curve trade off, pessimists abound too. One such pessimist is Niskanen (2002) who writes on the death of the Phillips curve to argue that, "for several decades now, macroeconomists have confused each other, generations of students, and too many policymakers by their search for the elusive Phillips Curve, a presumed negative relation between unemployment and inflation". Using the US data of 1960- 2001 (41 years) for inflation rate (lagged by 2 years) and the unemployment rate Niskanen in 2002 makes some very strong monetarists conclusions as follows: 1) There is no tradeoff of unemployment and inflation 2) In the long term, the unemployment rate is a "positive" function of the inflation rate 3) the minimum sustainable unemployment rate is about 3.7 percent and can be achieved only by a zero steady state inflation rate. There you have it.

Since 2002, we have two totally different views about traditional Phillips curve relationship. But these are assumed to be old time studies, with not much reference to modern era of financial crisis and chaotic monetary policy behavior in 2002-2008, stable inflation rate despite this monetary policy behavior and also the unemployment rate that has one time reached to as high as 9.4% (in USA in 2009
and 2010) and then came down to 5.2 in 2016. So the main question is: "Is there any kind of relationship between inflation and unemployment especially when the fiscal and monetary policies have become considerably more active than in previous years?" In this paper, we want to carry out another test of the Phillips Curve relevancy on empirical basis. In order to do that we shall examine data for both US and India as the latter has become the fastest growing major economy in the world in 2017. We will also look into and summarize the theoretical development in the Phillips Curve Hypothesis over the years.

Actually, any intermediate or principles of macroeconomics textbook will do equally good job of this summary, but here our objective is to point out the main theoretical arguments. A.W. Phillips in 1958 paper observed the data of the U.K. economy for the 96 years (from 1861 to 1957) regarding the percentage increase in the wage rate and the unemployment rate (unemployment rate here was taken as an index of the degree of excess demand of 'labor shortage' in the labor market). He found that there had been a trade-off between these two variables in the long-run. This means that whenever money wages increased faster, the unemployment rate declined. Hence, at the outset, the Phillips Curve Hypothesis is just an observation that the money wage rate and the unemployment rate of the economy have an inverse relationship. This relationship is shown in Figure 14.1.

There was obviously nothing revolutionary about finding a relationship like this, what was clearly prolific was Phillip's explanation of this relationship. He argued that there can be two economic reasons that are responsible for the trade-off.

Fig. 14.1 The Original Phillips Curve

First, wage rate being the price of labor, higher is the wage rate greater is the shortage of labor in the labor market, as it will be manifested by the lower unemployment. Hence high wage rate growth should be associated with lower unemployment. Secondly, as the wage rate went up, higher purchasing power was created that led to higher aggregate demand. This higher aggregate demand was thought to be responsible for the increased price level and the improved expected profit rate. This higher expected profit rate must have caused higher investment in the economy. Increased
investment via the multiplier process creates higher output and employment. To Phillip it did not seem completely evolutionary and illogical to post an inverse relationship between the increase in the money wage rate and the unemployment rate.

After Phillips produced his results for the U.K. economy, there happened a string of other studies, some of which clearly supported the observations of the Phillips trade-off and some others disputed them. Developments and repetition were also accompanied by modifications. In recent years, economists began to interpret the original Phillips relationship in terms of inflation and unemployment rather than wage rate increase and the unemployment rate as Phillips did.

The substitution of inflation rate for the percentage increase in wage rate was logical since the inflation rate is proportionately related to increase in the wage rate. In order to show this mathematically, let us assume that the wage rate is determined by the value of the marginal product of labour. As you may recall, the marginal product of labour is the increase in the total product and the product of labour is the increase in the total product due to employment of the last labour unit. The value of the marginal product is the product of the price of and the marginal product of labour. Obviously, a producer would be willing to employ labour up to that point at which the value of the marginal product of labour is equal to the wage rate the labour is earning. In mathematical notations, we can write:

wage rate = price of the product * marginal product of labour, or,

\[ W = P \times MP \]

where,

\[ W = \text{money wage rate}, P = \text{price level and MP = marginal product of labour} \]

Assuming that the marginal product of labour is constant, and totally differentiating the above equation,

\[ \text{Change in } W = \text{change in } P \times MP + \text{change in } MP \times P \]

Since MP is constant, change in MP is zero. Therefore, we have:

\[ \frac{\text{(Change in } W)}{W} = \frac{\text{(change in } P)}{P} \]

Which boils down to: percentage change in wage rate = percentage change in price level = inflation rate.

Hence, it is possible to view the Phillips Curve relationship in terms of a trade-off between inflation rate and the unemployment rate. Figure 14.2 shows such a trade-off about which we can say the following things.

The Phillips Curve was made popular by several empirical studies carried out in the early and middle sixties to prove the point that there is a trade-off between inflation and unemployment of the economy. By itself, a trade-off of this sort means that the governmental policies cannot solve both the problems of the economy simultaneously. The policy makers have to be ready to pay the price of inflation to solve unemployment and vice versa. The position of this curve determines the available combinations of inflation and unemployment. Any combination to the left of this curve is preferable to the one on the right of it, but it is unattainable by any policy change. Hence, the combinations on the left would be socially acceptable but practically impossible for the policy makers to arrive at. Nonetheless, policy makers have an option to select any combination on the curve that they find socially bearable.

This type of thinking based upon assistance offered by the Phillips Curve was dominant in the industrialized countries in the sixties. Policy makers did not hesitate to adopt expansionary policies when they thought unemployment in the economy was too high. The readiness for paying the price of inflation to solve the problem of unemployment was widespread in the sixties, and at least in the short-run, we did witness significant growth in these economies. The Phillips Curve hypothesis looked very impressive and extremely practical.

The experiences of the late sixties and seventies, however, did not repeat the success achieved by the earlier policy changes, and the economies of most of the industrialized world were beset by the simultaneous existence of inflation and unemployment popularly labelled the stagflation phenomenon. Besides claiming that the stagflation implied points off the Phillips Curve to the right side, there was no theoretical explanation in existence. Some economists argued in favour of even more policy activism by pointing out the Phillips Curve has shifted to the right and an economy in modern times must be ready to pay the higher price of inflation to solve the same amount of unemployment as before. They believed that the main reason for this increased sacrifice was the closeness of the economy to the full employment level. As the economy uses most of its available resources, it becomes difficult to employ further labour and this is the reason for the requirement of higher prices in terms of the inflation to solve the same problem of unemployment as before. This explanation, however, did not convince many other economists, especially the monetarists. However, before we examine the monetarist analysis, let us consider that the shape of the Phillips Curve under special Classical and Keynesian belief.
Modern Times Phillips Curve

At the theoretical level, the shape of the Phillips Curve can be significantly different when we consider these special thoughts of the Classical economists and the Keynesians. The Classical economists believed that there is always full employment in the economy because of the complete flexibility of the price level, the wage rate and the interest rate. Given this belief, no amount of unemployment can be reduced by any amount of inflation. Therefore, in a pure classical analysis, the shape of Phillips Curve would be vertical.

![Modern Times Phillips Curve](image)

Table 1

<table>
<thead>
<tr>
<th>Year</th>
<th>Inflation</th>
<th>Unemployment</th>
<th>Inflation</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>2.71</td>
<td>5.7</td>
<td>10.22</td>
<td>3.9</td>
</tr>
<tr>
<td>1996</td>
<td>2.94</td>
<td>5.5</td>
<td>8.98</td>
<td>3.9</td>
</tr>
<tr>
<td>1997</td>
<td>2.34</td>
<td>5.0</td>
<td>7.25</td>
<td>4.4</td>
</tr>
<tr>
<td>1998</td>
<td>1.55</td>
<td>4.6</td>
<td>13.17</td>
<td>4.2</td>
</tr>
<tr>
<td>1999</td>
<td>2.19</td>
<td>4.3</td>
<td>4.84</td>
<td>4.4</td>
</tr>
<tr>
<td>2000</td>
<td>3.37</td>
<td>4.1</td>
<td>4.02</td>
<td>4.0</td>
</tr>
<tr>
<td>2001</td>
<td>2.82</td>
<td>4.8</td>
<td>3.77</td>
<td>4.2</td>
</tr>
<tr>
<td>2002</td>
<td>1.6</td>
<td>5.9</td>
<td>4.31</td>
<td>4.3</td>
</tr>
<tr>
<td>2003</td>
<td>2.3</td>
<td>6.1</td>
<td>3.81</td>
<td>3.9</td>
</tr>
<tr>
<td>2004</td>
<td>2.67</td>
<td>5.6</td>
<td>3.77</td>
<td>3.9</td>
</tr>
<tr>
<td>2005</td>
<td>3.37</td>
<td>5.2</td>
<td>4.25</td>
<td>8.35</td>
</tr>
<tr>
<td>2006</td>
<td>3.22</td>
<td>4.7</td>
<td>5.79</td>
<td>7.9</td>
</tr>
<tr>
<td>2007</td>
<td>2.87</td>
<td>4.7</td>
<td>6.39</td>
<td>8.2</td>
</tr>
<tr>
<td>Year</td>
<td>USA Inflation</td>
<td>India Inflation</td>
<td>CPI Inflation</td>
<td>GDP Growth</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
<td>-----------------</td>
<td>---------------</td>
<td>------------</td>
</tr>
<tr>
<td>2008</td>
<td>3.82</td>
<td>5.9</td>
<td>8.32</td>
<td>8.0</td>
</tr>
<tr>
<td>2009</td>
<td>-32</td>
<td>9.4</td>
<td>10.83</td>
<td>9.4</td>
</tr>
<tr>
<td>2010</td>
<td>1.64</td>
<td>9.7</td>
<td>12.11</td>
<td>9.4</td>
</tr>
<tr>
<td>2011</td>
<td>3.14</td>
<td>9.0</td>
<td>8.87</td>
<td>6.3</td>
</tr>
<tr>
<td>2012</td>
<td>2.08</td>
<td>8.2</td>
<td>9.3</td>
<td>5.2</td>
</tr>
<tr>
<td>2013</td>
<td>1.46</td>
<td>7.4</td>
<td>10.92</td>
<td>4.9</td>
</tr>
<tr>
<td>2014</td>
<td>1.61</td>
<td>6.2</td>
<td>6.37</td>
<td>3.6</td>
</tr>
<tr>
<td>2015</td>
<td>3.1</td>
<td>5.2</td>
<td>5.88</td>
<td>3.9</td>
</tr>
<tr>
<td>2016</td>
<td>3.8</td>
<td>5.1</td>
<td>5.22</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Source: Department of Commerce, Commercial Data Service, Bureau of Economic Analysis
India data sources: www.tradingeconomics.com and www.theglobaleconomy.com
In the case of the U.S. recently, many have expressed the opinion that the Phillips Curve doesn't exist. Their argument is based on the observation that after the great recession, the economy has been growing, but no evidence of acceleration in inflation if found. In fact the Federal Reserve has had serious difficulty in reaching its inflation goal of 2 percent. Others have suggested that the Phillips Curve has flattened but it is alive but not well. In a recent article, Blanchard (2016), finds that, “Given expected inflation, a decrease in the unemployment rate led to an increase in inflation of .7 percent in the middle 1970s. The effect is now closer to .2 percent). Thus the Phillips Curve does seem to have flattened. It also appears that the Phillips Curve has shifted inward. Inflation depends on past inflation as well as on expected long-term inflation. According to Blanchard, the coefficient of past inflation on long term expected inflation has decreased since the 1980s and now it stands close to zero. From the above figure however, one can deduce that in its simplest form, the Phillips Curve in the period that we tested as best has three versions, most significant being in the last 12 years where the downward sloping shape is quite evident. In early years, the Phillips Curve trade-off is neither stable for long time, nor is it at the low levels of inflations and unemployment. One can argue that there have been shifts in small scale Phillips Curve to the right.
Earlier studies on the Indian economy have either found that the Phillips Curve does not exist in the Indian case or they arrived at the conclusion that data contradicts the Phillips Curve. For example, Dholakia (1990) uses data on inflation and output for the period 1950-85 and concludes that no relationship exists between the two, Balakrishnan (1991), using data for 1950-1980 for the Indian manufacturing sector finds a negative relation for the two variables, thus, contradicting the Phillips Curve. Studies done in the 1980s have reached similar results (See Bhalla, 1981; Chatterhi, 1989 Rangarajan, 1983; Samata, 1983).

Most recent studies, however, take into account supply shocks, which are quite common in the Indian economy, and expand their model. When they include shocks in their equations they find that the traditional Phillips Curve does emerge. Paul (2009), for example, in a comprehensive study, includes supply shocks such as, drought, oil crises, and liberal policy shocks and finds that the Phillips Curve is alive not only for the post-liberalization period but also for the pre liberalization period as well. He, however, relates output gap only to the Industrial sector. His use of WPI as inflation variable has been criticized and also more importantly the use of the Hodrick- Prescott model in estimating the output gap is questioned.

Dua and Guar (2009) use quarterly data for 1996-2005 period that include supply shock and conclude that there exists a positive relation between output gap and inflation. Another important study done by Singh et al. argues that past studies have used incorrect measurements of both variables and have therefore found difficulty in uncovering the Phillips Curve. They claim that the H-P filter approach is a spurious method to estimate the output gap and the Indian economy is very sensitive to the supply shocks. In addition, the H-P method does not control for the structural shocks. After criticizing the H-P model to identify the output gap, they use a non-linear Kalman filter approach to estimate the output gap. They claim that the Kalman filter is inappropriate to capture all dynamics of the Indian economy. However, their findings are limited in that they conclude that the Phillips Curve exists but only for the later period in their study (from 1st quarter 2004 to 1st quarter 2009).

Section 2: Empirical Estimation of India's Phillips Curve

We use a VAR model to produce an empirical estimation of the Phillips Curve effect for India between the years 1991 and 2014. There are two advantages of using a VAR model. The first one is that deals with potential endogeneity issues between unemployment and either output or inflation. The second one is that the Phillips Curve effect may take more than a year to materialize. The impulse response function (IRF) that a VAR model produces allows capturing effects that last longer than the frequency of the data. Since quarterly data for the variable we use is not available, we are constrained to use yearly data.

We construct two VAR models. The first one captures the interaction between inflation and unemployment. The second one captures the interaction between inflation and the output gap (taken from the HP filtered GDP series.) We expect other economic variables to have an effect either on inflation, unemployment, or the output gap as well. We capture this other economic conditions with three control variables, the nominal exchange rate, trade (exports plus imports over GDP), and the domestic lending rate to business. In addition, between 1991 and 2014 there were three distinctive real shocks in 1991, 1999, and 2000. Therefore we add a dummy (D) variable to control for these real shocks. Our model looks as follows:

\[
\begin{align*}
\text{rr}_t & = c_1 + a_1 \text{Inflation}_t + a_2 \text{Unemployment}_t + \varepsilon_1, \\
\text{Ur}_t & = c_2 + a_3 \text{Inflation}_t + a_4 \text{Unemployment}_t + \varepsilon_2, \\
\text{Y}_t & = c_3 + a_5 \text{Inflation}_t + a_6 \text{Unemployment}_t + \varepsilon_3,
\end{align*}
\]

Where rr denotes inflation, \( u \) is the unemployment rate, \( D \) is the real shock dummy variable, \( LR \) is the lending rate to business, \( Fx \) is the nominal exchange variable, \( Trade \) is the trade variable, and \( Y \) is the output gap (in percent terms). According to the first model, past inflation has a significant effect on present inflation and unemployment is significantly affected by inflation and the real shocks.
VAR system, lag order 1
OLS estimates, observations 1992-2014 (T = 23)
Log-likelihood = -45.206342 Determinant of covariance matrix = 0.17468553
AIC = 5.1484
BIC = 5.8395
HQC = 5.3222
Portmanteau test: LB(5) = 19.6632, df = 16 [0.2358]

Equation 1: Inflation
Heteroskedasticity-robust standard errors, variant HC1

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>const</td>
<td>-0.743832</td>
<td>13.8785</td>
<td>-0.0536</td>
</tr>
<tr>
<td>Inflation_1</td>
<td>0.488628</td>
<td>0.189822</td>
<td>2.5741</td>
</tr>
<tr>
<td>U_1</td>
<td>0.851208</td>
<td>0.204251</td>
<td>4.167</td>
</tr>
<tr>
<td>D</td>
<td>-3.54629</td>
<td>2.04178</td>
<td>-1.7369</td>
</tr>
<tr>
<td>Lending_rate</td>
<td>0.127421</td>
<td>0.427474</td>
<td>0.291</td>
</tr>
<tr>
<td>Fx</td>
<td>-0.0606471</td>
<td>0.134972</td>
<td>-0.4493</td>
</tr>
<tr>
<td>Trade</td>
<td>0.0678783</td>
<td>0.0629318</td>
<td>1.0786</td>
</tr>
</tbody>
</table>

Mean dependent var | 7.639233 | S.D. dependent var | 3.054087 |
Sum squared resid  | 109.9207 | S.E. of regression | 2.621077 |
R-squared           | 0.464334 | Adjusted R-squared | 0.263460 |

F(6, 16) = 3.915544 P-value(F) = 0.013425
rho = -0.191633 Durbin-Watson = 2.320582

F-tests of zero restrictions:
All lags of Inflation F(l, 16) = 6.6262 [0.0204]
All lags of U F(l, 16) = 0.17368 [0.6824]

Equation 2:
Unemployment
Heteroskedasticity-robust standard errors, variant HC1

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>const</td>
<td>4.02883</td>
<td>1.6736</td>
<td>2.4073</td>
</tr>
<tr>
<td>Inflation_1</td>
<td>-0.0364216</td>
<td>0.0191531</td>
<td>-1.9016</td>
</tr>
<tr>
<td>U_1</td>
<td>-0.0340213</td>
<td>0.270697</td>
<td>-0.1257</td>
</tr>
<tr>
<td>D</td>
<td>0.422106</td>
<td>0.181912</td>
<td>2.3204</td>
</tr>
<tr>
<td>Lending_rate</td>
<td>0.0470628</td>
<td>0.0302469</td>
<td>1.5560</td>
</tr>
<tr>
<td>Fx</td>
<td>-0.00252385</td>
<td>0.0106188</td>
<td>-0.2377</td>
</tr>
<tr>
<td>Trade</td>
<td>-0.00407962</td>
<td>0.00662421</td>
<td>-0.6159</td>
</tr>
</tbody>
</table>

Mean dependent var | 3.978261 | S.D. dependent var | 0.298415 |
Sum squared resid  | 0.527639 | S.E. of regression | 0.240497 |
R-squared           | 0.463866 | P-value(F)         | 0.003031 |

F(6, 16) = 5.463866 P-value(F) = 0.003031
rho = -0.0106247 Durbin-Watson = 2.205117

F-tests of zero restrictions:
All lags of Inflation F(l, 16) = 3.6161 [0.0754]
All lags of U F(l, 16) = 0.015796 [0.9016]

According to the second model, present inflation is significantly affected by past inflation and also by the lending rate, and output gap is significantly affected by past inflation and past output gaps.
**VAR system, lag order 1**


Determinant of covariance matr  tx= 0.00052269473

AIC = -0.6634

BIC = 0.0278

HQC = -0.4895

Portmanteau test: LB(5) = 28.3111, df= 16 [0.0290]

Equation 1: Inflation Heteroskedasticity - robust standard errors, variant HCl

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>canst</td>
<td>5.95933</td>
<td>12.7673</td>
<td>0.4668</td>
</tr>
<tr>
<td>Inflation</td>
<td>0.408279</td>
<td>0.1695</td>
<td>2.4087</td>
</tr>
<tr>
<td>YGap_l</td>
<td>16.2499</td>
<td>33.8376</td>
<td>0.4802</td>
</tr>
<tr>
<td>D</td>
<td>-3.61992</td>
<td>1.86619</td>
<td>-1.9397</td>
</tr>
<tr>
<td>Lending_rate</td>
<td>0.0135202</td>
<td>0.554947</td>
<td>0.0244</td>
</tr>
<tr>
<td>Fx</td>
<td>-0.080784</td>
<td>0.137474</td>
<td>-0.5876</td>
</tr>
<tr>
<td>Trade</td>
<td>0.0583529</td>
<td>0.0675435</td>
<td>0.8639</td>
</tr>
</tbody>
</table>

Mean dependent var 7.639233 S.D. dependent var 3.054087

Sum squared resid 109.2963 S.E. of regression 2.613622

R-squared 0.467377 Adjusted R -squared 0.267643

F(6, 16) 4.711085 P-value(F) 0.006056

rho 0.208005 Durbin-Watson 2.348403

F-tests of zero restrictions:

All lags of lnflation F(l, 16) = 5.802 [0.0284]

All lags of YGap F(l, 16) = 0.23062 [0.6376]

Equation 2: YGap Heteroskedasticity - robust standard errors, variant HCl

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>canst</td>
<td>0.0111848</td>
<td>0.00455486</td>
<td>0.2456</td>
</tr>
<tr>
<td>Inflation</td>
<td>0.00394792</td>
<td>0.000973049</td>
<td>4.0573</td>
</tr>
<tr>
<td>YGap_l</td>
<td>0.340858</td>
<td>0.114787</td>
<td>2.9695</td>
</tr>
<tr>
<td>D</td>
<td>0.00602261</td>
<td>0.00659517</td>
<td>0.9132</td>
</tr>
<tr>
<td>Lending_rate</td>
<td>-0.00218444</td>
<td>0.00228684</td>
<td>-0.9552</td>
</tr>
<tr>
<td>Fx</td>
<td>-0.00033618</td>
<td>0.000603619</td>
<td>-0.5570</td>
</tr>
<tr>
<td>Trade</td>
<td>-5.64154e-05</td>
<td>0.000483894</td>
<td>-0.1166</td>
</tr>
</tbody>
</table>

Mean dependent var -0.000904 S.D. dependent var 0.021155

Sum squared resid 0.002698 S.E. of regression 0.012985

R-squared 0.0762005 Adjusted R -squared 0.623257

F(6, 16) 11.03379 F-value(F) 0.000063

rho 0.153895 Durbin-Watson 1.655373

F-tests of zero restrictions:

All lags of lnflation F(l, 16) = 16.461 [0.0009]

All lags of YGap F(l, 16) = 8.8179 [0.0090]
But to observe if the Phillip's Curve effect has any significant presence we need to look at the IRFs produced by these models. In particular, how unemployment and the output gap react to an inflation shock.

Figure 1 shows that if there is a positive shock to inflation, then the unemployment rate falls as would be expected according to the Phillips Curve relationship. This effect, however, is only temporary lasting for 4 or 5 years. However, more importantly, the impact on the unemployment rate is not significantly different than zero. Within one year of the inflation shock the unemployment rate falls almost one percent point. But this change is not enough to sustain that due to the shock or if it is due to the "noise" in the variables.

![Image showing response of unemployment to a shock in inflation with bootstrap confidence interval.]

But Figure 2 shows a different story. A positive shock to inflation increases rather than reduces the output gap. This effect lasts for around nine years. In this case, however, the impact of inflation on the output gap becomes significant, but only for one year lagged effect.
It is not difficult to reconcile the observed result that an increase in inflation reduces unemployment and at the same time it increases the output gap. There are some reasons why this might happen. One reason could be poor quality data that is affecting the results. Either unemployment and/or output have a significant amount of noise. Another reason might be that even if unemployment is properly measured, this variable is designed in a way that conceals effective unemployment. For instance, an increase in government jobs that do not add value to the economy; these jobs are de facto working as an unemployment benefit for which the recipients of the benefits are counted as "employed."

There is a reason to sustain that for the time period under analysis, a positive shock to inflation may produce an increase in output gap. Between 1991 and 2014 India had inflation rates that go from 3.7% to 13.9%. India shows both, high inflation rates and also a high volatility. The inflation rate standard deviation is 3.2; almost as much as the lowest inflation rate observed between 1991 and 2014. Arguably, for the Phillip's Curve effect to materialize, the country under observation should have a low and stable inflation. If, on the contrary, inflation is high and volatile two other effects become more significant. The higher inflation rate increases the costs of inflation and it is possible that this makes the next increase in inflation too costly for the economy to increase output and reduce unemployment. The high volatility also means that there is higher level of uncertainty with respect to future inflation and therefore economic agents may not react as expected when they are under the presence of an inflation shock because; they might ignore the change in inflation as part of the noise of the inflation they are used to live with.

The empirical application to India fails to show a significant presence of a Phillip's Curve effect on two accounts. First, the Phillip's Curve effect is mostly not statistically significant. Second, unemployment and output gap show an inconsistent reaction with respect to each other.

**Concluding Remarks:**

The study of the Phillips Curve relationship poses a few serious questions, in the U.S., Structural changes have led not only to the shift of the curve but have also flattened the
slope of the relationship. Those who use the Phillips relationship to forecast inflation have faced some econometric issues. Academic research shows weaker relationship but the Federal Reserve Bank still believes that the Phillips Curve is alive and provides useful information in monetary policy making.

In the case of India, data limitations create measurement problems. Statistical results are less reliable. There is no well-defined long-time series on unemployment. Data on unemployment as supplied by employment exchanges are biased and numbers are probably understated. The RBI has multiple goals beside price stability and full employment. In addition, weather conditions and other supply and demand shocks affect the Phillips Curve relationships. Future studies may take this into consideration and come up with firm policy suggestions.

References


www.tradingeconomics.com

www.theglobaleconomy.com


************
This study carried to investigate impact of dividend policy on share price during the year 2004 – 2016 of Automobile sector in India. The study is empirical in nature and it's based on the secondary data. The study period has been considered from the year 2004 to 2016; it consists of economic recession period of 2008-09. National Stock Exchange (NSE) listed Automobile firms were considered for samples during the study period from the years 2004 – 2016. Finally 10 firms are chosen as sample based on the availability of data. Descriptive statistics, Correlation, Fixed Effect Model (FEM) and Hausman Test were applied for the analysis of the study. Market share price (SP) of selected firms was taken as the dependent variable while Dividend yield (DY), Dividend payout ratio (DPR), Earning retention ratio (ERR), Earning per share (EPS), and Leverage (LVRG) were taken as explanatory variables. The finding of the study concludes that DY is negatively correlated with SP in the overall study period. In addition, it was found that DY and DPR had the significant impact on the SP for the period of post economic recession period. Hence it was ascertained in this study, the share price (SP) was affected by the dividend policy of the firm.

**Keywords:** Dividend policy, Market share price, Economic recession, Dividend payout ratio and Earning retention ratio.

**JEL Classification Code:** G35, G39
Dividend decision of the company is an important issue to be determined by the financial managers and dividend is the key indicator of the market share price and firms value. The dividend policy of firm determines what proportion of earnings is paid to shareholders by the way of dividends and what proportion is ploughed back to the firm for reinvestment purpose that is retained earnings. Here the question on whether the dividend policy is an indicator of an increase in share price or not. Hence, still there is a conflict between the researchers; thus relationship of dividend policy and share prices has been extensively investigated by renowned researchers in their studies especially in developed and developing economies. Therefore this study carries to explain whether the relationship between dividend policy and market share price, and impact of dividend payout on share price during the global economic recession, specifically on Automobile sector in India. Previously many researchers they have propounded several theories about the dividend and shareholders wealth. There is a significant literature on the relationship between dividend and share price. The review of past literature are provided here to enlighten the view of the concept that are significant for building a framework for the study. Miller and Modigliani (1961), found that in the world without taxes, transaction costs and market imperfections, dividend policy is actually irrelevant. Black and Scholes (1974), stated that, the choice between common shares that to pay dividend and pay no dividend was equal, if transaction costs and taxes are absent. Asquith and Mullins (1983) found that regular increase in dividend makes greater positive impact on the shareholders’ wealth in compare with dividend payment initiation. Farid (2000), stated dividend and retained earnings has the significant effect on the share prices. Osman and Ahsan (2015), retained earning and dividend yield has the remarkable influence on the stock prices. Balakrishnan (2016), identified significant impact generated by the dividend on the market stock prices. On contrary Stacescu (2006), stated the outcomes of cross-sectional analysis examined the relationship between the firms dividend payments and share stock price is significantly negative. It refers dividend payout creates the absolutely negative impact on the share price. Further this negative association indicates the dividend decrease or dividend cut, it reflects on the stock price. Lucy and William (2001), explored the stock price and dividend relation in the dividend management, they were found the non-linearity relationship between the market stock price and dividend based on the managerial choice of dividend payout ratio.

From these reviews we can come to know there is a difference of opinions among the researchers based on their results they were obtained. Hence for the extended view various studies are analysed and described as reviews in the below.

Review of Literature:

At its first beginnings, Miller and Modigliani (1961) illustrated the irrelevance of dividends and that it had no influence on share prices. Since then, those researchers and practitioners who have disagreed with this theory introduced competing theories and hypotheses to illustrate the fact that dividends do matter in an imperfect capital marker. Kanwal (2012) study results show that stock dividend, earnings per share and profit after tax have a significant positive relation to stock prices of chemical and pharmaceutical sector of Pakistan. Further it examines retention ratio and return on equity has the negative insignificant relation with stock prices of a firm. Habib et al. (2012), used cross sectional regression analysis to find out the effect of dividend yield and payout ratio on stock prices. The results of their study show that dividend yield has a positive effect on stock prices while the payout ratio, size and debt negative effect on stock prices. An empirical study conducted by Hussain and Malik (2012), revealed the impact of dividend policy on stock returns with special reference to South Asian countries (India, Sri Lanka and Pakistan) using 40 cross sections and the results revealed that dividend policy of any company is helpful for the increase of market return and sustaining stock price. Hence it explores the significant relationship between the dividend policy and share price.

Das and Samanta (2012), in their article titled “Dividend policy and its effect on shareholders’ wealth: a study on Indian banking sector in liberalized era” conducted a study on Indian banking companies in post liberalization era and they found that for public sector banks in India dividend policy is an important determinant of shareholders’ wealth etc. Abdullah (2013), found in his empirical estimation based on the Fixed Effect Model (FEM) and Random Effect Model (REM) showed significant negative relation between dividend yield and stock price while retention ratio has a negative but statistically insignificant relationship with stock market Prices. Further shown that return on equity and earnings per share have statistically significant positive impact on stock price and Profit after tax has a significant negative impact on stock market prices of the commercial banks of Bangladesh. Owen and Philimon (2013), examined the effects of dividend policy on the share price of a firm. The
results show that there is no relationship between dividend policy and share price of a firm. Further it found that there is no significant relationship between earning per share and share price. The study concluded that dividend policy does not affect share price and that shareholder value is maintained even though firms have adopted conservative dividend policies.

Abdullah Al-Hasan et al. (2013), investigated the relationship between dividend policy and market price per share. The study used regression model and the results have shown that there is a positive relationship between the share price and dividend per share. It also indicated that highly payout industries have high share price than low payout industries. Hence, the study has proved that there is a significance effect of dividend policy on share price which supports the relevance theory of the dividend policy. Dewasiri and Weerakoon (2014) study used cross section random effect model to reveal the relationship between dividend policy and share price. The results of cross section random effect model revealed that there is a significant negative impact from dividend payout, a significant positive impact from company size and no evidence of significant impact from dividend yield on stock price volatility. Furthermore, Granger causality tests revealed that there is no short term impact from dividend payout on stock price volatility.

Tharsiga (2015) analysed results revealed that dividend payout has significant positive impact on share price. Further correlation analysis results shows that there is positive significant relationship between dividend payout and share price volatility. Matharu and Ravi (2015), empirically analysed the market stock price changes with the dividend announcement of 25 BSE listed firms in India. The expected and abnormal returns from the market were evaluated using the capital asset pricing model and paired t-test was employed to test the impact of dividend announcements on share prices of selected companies. The attained results were quietly revealed that there is a significant difference in the impact of dividend announcements in pre and post announcement period on the share prices of the selected companies.

Silvia (2017) tested the relationship between dividend payout and leverage of firms in United States (US) during the period of 2006 – 2011. It particularly focused on the relationship between the firms' dividends and leverage after the end of 2008. The research findings reveal that the deposit leverage has the significant negative impact on the dividend payout ratio, in contrary the impact of non - deposit leverage on the dividend payout ratio is significantly positive.

The literature provides knowledge of relationship between dividend and share price. In general most of the earlier studies had followed the similar statistical tools and methodology to estimate the relationship between dividend policy and share prices. Hence, this study is an attempt to evaluate the relationship between dividend policy and share price as well as it measures the impact of dividend policy on share price during the global economic recession (before, during and after the recession period) happened in 2008-09.

**Significance of the study:**

Dividend policy and the share price are not a new phenomenon, many studies have been conducted research on this concept. Still there is disagreement among different researchers. on the relationship of DP and stock price volatility (SPV) and it is still unexplained and is considered as debatable in corporate finance. However, how this relationship was in the economic recession period is the big question before all researchers. From the recession period many researches had been done in the various sectors based on the different time period. But, this research is an attempt to find the impact of DP on the SP of the Automobile Industry during 2004 – 2016.

**Objectives of the Study:**

The following objectives of the study have been given:

1. To identify the relationship between dividend policy and market share price of Automobile sector in India before financial crisis, during financial crisis and after financial crisis.

2. To find out the impact of the dividend policy on the market share price of Automobile Industry in India during the period of 2004-2016.

**Hypotheses Developed for the Study:**

H01: There is no significant relationship between dividend yield (DY) and share price (SP).

H02: Dividend payout ratio (DPR) and share price (SP) have relationship between them.

H03: There is no significant impact of dividend yield (DY) on share price (SP) before global financial crisis.

H04: Dividend payout ratio (DPR) does not have impact on share price (SP) before global financial crisis.

H05: There is no significant impact of dividend yield (DY) on share price (SP) during the global financial crisis.
H06: Dividend payout ratio (DPR) does not have impact on share price (SP) during the global financial crisis.
H07: Dividend yield (DY) does not have impact on share price (SP) after the global financial crisis.
H08: There is no significant impact of Dividend payout ratio (DPR) on share price (SP) after global financial crisis.

**Research Methodology:**

This study evaluates the impact of dividend policy on the stock price of the Automobile firms listed in the NSE of India. To assess the impact level, Fixed Effect Model (FEM) and Hausman test were used. This research measures the impact of dividend policy (DP) on the stock price (SP) over the span of last thirteen years, i.e. 2004–05 to 2015–16.

Samples: The basic criterion for the selected sample firms are, the company must declared dividend for the last 13 consecutive years. Based on the criteria and the availability of data sources, finally 10 companies were chosen out of the total 17 listed companies in NSE.

Data source: This study is empirical in nature. It is completely based on secondary data. The main source of data for the study is annual reports of the selected units. This required data was collected from the website of moneycontrol.com, from the year of 2004 - 2016.

Tools used: The statistical tools of Descriptive Statistics, Correlation Matrix, Fixed effect model (FEM), and Hausman test were employed, and Eviews Version 9 software Package was used for the analysis.

Period of the study: The data collected for the 13 years starting from the 2004 – 05 to 2015 – 16. The study period divided in to the three different economic cycles, 2004 – 2007 period analyses the before economic recession period, 2008-2009 durational data investigates the effects of this financial crisis and 2010 – 2016 data measures the effect of after the economic recession in the Automobile sector in India.

**Companies selected as sample from Automobile Industry in India**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Companies Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>TATA Motors</td>
</tr>
<tr>
<td>2.</td>
<td>TVS Motors</td>
</tr>
<tr>
<td>3.</td>
<td>Ashok Leyland</td>
</tr>
<tr>
<td>4.</td>
<td>MahendraScooters</td>
</tr>
<tr>
<td>5.</td>
<td>Mahendra&amp;Mahhendra</td>
</tr>
<tr>
<td>6.</td>
<td>SML</td>
</tr>
<tr>
<td>7.</td>
<td>Atul</td>
</tr>
<tr>
<td>8.</td>
<td>Maruthi</td>
</tr>
<tr>
<td>10.</td>
<td>VST Motors</td>
</tr>
</tbody>
</table>
Variables:

**Table 1**  
Measures of the Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Dependent Variable</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Price</td>
<td>Market share price is the closing traded price of the stocks in the stock exchange.</td>
<td>SP</td>
</tr>
<tr>
<td><strong>Independent Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividend Payout Ratio</td>
<td>Dividend per share divided by earning per share.</td>
<td>DPR</td>
</tr>
<tr>
<td>Dividend Yield</td>
<td>Dividend per share divided by price per share.</td>
<td>DY</td>
</tr>
<tr>
<td>Earning Retention Ratio</td>
<td>Net income – Dividend divided by Net income.</td>
<td>ERR</td>
</tr>
<tr>
<td>Leverage</td>
<td>Long term debt divided by equity shares.</td>
<td>LVRG</td>
</tr>
<tr>
<td>Earning Per Share</td>
<td>Net profit available for equity shareholder divided by No. of equity share holders.</td>
<td>EPS</td>
</tr>
</tbody>
</table>

**Econometric Model:**

The regression model has been used for analysis consists of the one dependent variable and five independent variables. This model is basically developed to relate SP with the two main measures of dividend policy; one is dividend yield (DY) and another dividend payout ratio (DPR). The other variables like EPS, ERR and LVRG are considered as the control variables, which helps to test the effects on share prices.

The model adopted for this study having regard to some studies in empirical literature is stated in equation below:

\[
SP_i = \beta_0 + \beta_1 DPR_i + \beta_2 DY_i + \beta_3 ERR_i + \beta_4 LVRG_i + \beta_5 EPS_i + \epsilon_i.
\]

Where, SP = Market Share Price

DPR = Dividend Payout Ratio

DY = Dividend Yield

EPS = Earning Per Share

ERR = Earning Retention Ratio

LVRG = Leverage
Analysis And Interpretation:

Table 2
Descriptive Statistics/Jarque - Bera Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sp</th>
<th>Dpr</th>
<th>Dy</th>
<th>Eps</th>
<th>Err</th>
<th>Lvrg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.39</td>
<td>31.31</td>
<td>0.06</td>
<td>33.11</td>
<td>64.84</td>
<td>21.98</td>
</tr>
<tr>
<td>Median</td>
<td>3.06</td>
<td>26.25</td>
<td>0.02</td>
<td>23.35</td>
<td>71.04</td>
<td>0.56</td>
</tr>
<tr>
<td>Maximum</td>
<td>370.8</td>
<td>213.7</td>
<td>0.87</td>
<td>15.86</td>
<td>11.70</td>
<td>262.0</td>
</tr>
<tr>
<td>Minimum</td>
<td>7.32</td>
<td>-17.60</td>
<td>0.00</td>
<td>-14.72</td>
<td>-11.37</td>
<td>0.00</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>68.90</td>
<td>27.37</td>
<td>0.13</td>
<td>34.43</td>
<td>28.30</td>
<td>66.81</td>
</tr>
<tr>
<td>Skewness</td>
<td>2.31</td>
<td>4.05</td>
<td>3.74</td>
<td>1.37</td>
<td>-3.56</td>
<td>2.88</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>9.33</td>
<td>25.84</td>
<td>18.05</td>
<td>4.63</td>
<td>21.25</td>
<td>9.50</td>
</tr>
<tr>
<td>Jarque – bera</td>
<td>3.33</td>
<td>318.3</td>
<td>153.1</td>
<td>55.14</td>
<td>208.0</td>
<td>33.33</td>
</tr>
<tr>
<td>Probability</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source: Authors' Computation.

Table 2 Descriptive statistics shows the results of variable, which are involved in this study to analyse the impact of dividend policy on the share price during the economic recession. The SP which is the dependent variable, its mean and median is 5.39 to 3.06. The LVRG showed mean and median as 21.98 and 0.56. The variable ERR showed mean as 64.84 and median is 71.04. The DY showed the mean as 0.06 and median as 0.02. The EPS showed the mean value 33.11 and median value 23.35. In the last one variables DPR, it showed the mean value as 31.31 and median value is 26.25.

Table 3
Correlation Analyses Between Variables

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>SP</th>
<th>DPR</th>
<th>DY</th>
<th>EPS</th>
<th>ERR</th>
<th>LVRG</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>1</td>
<td>-0.204</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPR</td>
<td>-0.204</td>
<td>1</td>
<td>-0.042**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DY</td>
<td>-0.003***</td>
<td>-0.042**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPS</td>
<td>0.450</td>
<td>-0.175</td>
<td>0.177</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERR</td>
<td>0.071*</td>
<td>-0.895</td>
<td>0.068*</td>
<td>0.008***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>LVRG</td>
<td>-0.040**</td>
<td>-0.190</td>
<td>0.372</td>
<td>0.157</td>
<td>0.190</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Authors' Computation.

*** Correlation is significant at the 0.01% level
** Correlation is significant at the 0.05% level
* Correlation is significant at the 0.10 % level

Correlation matrix of all variables included in the analysis is presented in Table 3 which is calculated based on data of 10 Automobile firms’ observations. The above results show that SP is negatively correlated with DY at the 1 percent level of significance with the p-value of -0.003. Further it positively correlated with ERR and negatively correlated with LVRG at the significance level of 10 percent (0.071) and 5 percent (-0.040) respectively. In addition results showed DY has the negative relationship with DPR at the 5 percent significance value of (-0.042). Hence, “H01: There is no significant relationship between dividend yield (DY) and share price (SP)” is rejected. Further the DPR has the negative and insignificant relationship with SP. Hence the “H02: Dividend payout ratio (DPR) and share price (SP) doesn’t have relationship between them” is accepted.
Table 4
Fixed effect model (2004 -2007)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1330.550</td>
<td>2960.903</td>
<td>0.449</td>
<td>0.657</td>
</tr>
<tr>
<td>LVRG</td>
<td>-33.283</td>
<td>33.399</td>
<td>-0.996</td>
<td>0.028</td>
</tr>
<tr>
<td>ERR</td>
<td>-16.488</td>
<td>27.566</td>
<td>-0.598</td>
<td>0.555</td>
</tr>
<tr>
<td>EPS</td>
<td>35.856</td>
<td>16.809</td>
<td>2.133</td>
<td>0.042</td>
</tr>
<tr>
<td>DY</td>
<td>-339.413</td>
<td>1650.31</td>
<td>-2.056</td>
<td>0.050</td>
</tr>
<tr>
<td>DPR</td>
<td>17.504</td>
<td>47.425</td>
<td>0.369</td>
<td>0.715</td>
</tr>
</tbody>
</table>

EFFECTS SPECIFICATION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Prob. (F-Statistic)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Squared</td>
<td>0.532</td>
<td></td>
<td>0.005</td>
</tr>
<tr>
<td>Adjusted R-Square</td>
<td>0.491</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Statistic</td>
<td>2.036</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ Computation.

Form the results of Table 4 shows, LVRG, ERR, EPS, DY and DPR have t-values of -0.996, -0.598, 2.133 -2.056, 0.369 with respective probability values (P-values) of 0.028, 0.555, 0.042, 0.050, 0.715 respectively. These probability values of the variables are also known as the observed or exact level of significance. Based on the probability values LVRG, EPS and DY are significant with the SP at the 5% significance level, while others are not significant. This reveals that these explanatory variables of LVRG, EPS and DY have significant effect on the SP. Hence, H03: There is no significant impact of dividend yield (DY) on share price (SP) before global financial crisis” is rejected. And the DPR have impact on share price (SP) before global financial crisis” is accepted.

From the value of the R-squared (R2), It concluded that the regressor in this model explains, over 53.2% of the systematic variations in share price during the period of 2004 – 2007. This is complemented by the adjusted R-square of 45.1%.

The F-statistic of 2.036 is highly significant, because p-value is 0.005. This exhibits that there exists a significant linear relationship among SP and the explanatory variables such as LVRG, EPS, and DY. In which the LVRG and DY have the negative impact on the SP. At the same time the EPS has the positive impact on SP of the Automobile Industry during the study period.

Table 5

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-Section Random</td>
<td>8.152</td>
<td>5</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Source: Authors’ Computation.

In the Table 5 the Hausman test was applied to explain validity of the FEM in the study. The p-value of the Hausman test is (0.003) at the level of 5% d.f, its highly significant, further it shows that the FEM was most suitable for appropriate results of this study.
Table 6
Fixed Effect Model (2008 -2009)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1675.736</td>
<td>6154.180</td>
<td>2.722</td>
<td>0.041</td>
</tr>
<tr>
<td>LVRG</td>
<td>-52.293</td>
<td>46.804</td>
<td>-1.117</td>
<td>0.039</td>
</tr>
<tr>
<td>ERR</td>
<td>-529.752</td>
<td>191.029</td>
<td>-2.773</td>
<td>0.314</td>
</tr>
<tr>
<td>EPS</td>
<td>55.367</td>
<td>17.769</td>
<td>3.115</td>
<td>0.026</td>
</tr>
<tr>
<td>DY</td>
<td>-8692.098</td>
<td>3607.611</td>
<td>-2.409</td>
<td>0.060</td>
</tr>
<tr>
<td>DPR</td>
<td>10.527</td>
<td>44.564</td>
<td>0.236</td>
<td>0.822</td>
</tr>
</tbody>
</table>

EFFECTS SPECIFICATION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Prob. (F-Statistic)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Squared</td>
<td>0.946</td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Adjusted R-Square</td>
<td>0.898</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Statistic</td>
<td>6.367</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ Computation.

Table 6 shows the result that LVRG, ERR, EPS, DY and DPR have t-values of -1.117, -2.773, 3.115, -2.409, 0.236 with respective probability values (P-values) of 0.039, 0.314, 0.026, 0.060, 0.822 respectively. These probability values of the variables are also known as the observed or exact level of significance. Based on the probability values LVRG and EPS are significant with SP at the 5% significance level. Further DY is significant with SP at the 10% level of significance. Hence, “H05: There is no significant impact of dividend yield (DY) on share price (SP) during the global financial crisis is rejected. It reveals the explanatory variables of LVRG, EPS and DY has significant effect on the SP. In addition the other explanatory variables DPR and ERR has no significant effect on the SP. Therefore, “H06: Dividend payout ratio (DPR) does not have impact on share price (SP) during the global financial crisis is accepted.

From the value of the R-squared (R2), It is concluded that the regressor in this model explain over 94% of the systematic variations in share price during the period of 2008 – 2009. This is complemented by the adjusted R-square of 79%.

The F-statistic of 6.367 is highly significant with the p-value of 0.000. This exhibits that there exists a significant linear relationship between SP and the explanatory variables such as LVRG, EPS, and DY. In which the LVRG and DY had the negative impact on the SP. At the same time the EPS has the positive impact on the SP of the Automobile firms during this period.

Table 7

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross - Section Random</td>
<td>12.212</td>
<td>5</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: Authors’ Computation.

The Table 7 illustrates, the Hausman test was applied to explain validity of the FEM in the study. The p-value in the Hausman test (0.000) is highly significant, further it shows that the FEM was most suitable for appropriate results of this study.
### Table 8  
**Fixed Effect Model (2010 -2016)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1442.355</td>
<td>181.305</td>
<td>7.955</td>
<td>0.000</td>
</tr>
<tr>
<td>LVRG</td>
<td>0.276</td>
<td>0.816</td>
<td>0.338</td>
<td>0.736</td>
</tr>
<tr>
<td>ERR</td>
<td>-8.555</td>
<td>1.929</td>
<td>-4.433</td>
<td>0.260</td>
</tr>
<tr>
<td>EPS</td>
<td>-3.962</td>
<td>1.479</td>
<td>-2.679</td>
<td>0.009</td>
</tr>
<tr>
<td>DY</td>
<td>-208.369</td>
<td>184.931</td>
<td>-1.126</td>
<td>0.004</td>
</tr>
<tr>
<td>DPR</td>
<td>-9.180</td>
<td>1.957</td>
<td>-4.690</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**EFFECTS SPECIFICATION**

<table>
<thead>
<tr>
<th></th>
<th>R-Squared</th>
<th>Prob. (F-Statistic)</th>
<th>0.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted R- Square</td>
<td>0.867</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Statistic</td>
<td>26.160</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors' Computation.

From the results of Table 8, LVRG, ERR, EPS, DY and DPR have t-values of 0.338, -4.433, -2.679, -1.126, -4.690 with respective probability values (P-values) of 0.736, 0.260, 0.009, 0.004, 0.000 respectively. Based on the probability values, EPS, ERR, and DPR had significant effect on the SP at the 1% level. For that reason, “H07: Dividend yield (DY), does not have impact on share price (SP) after the global financial crisis” and “H08: There is no significant impact of dividend payout ratio (DPR) on share price (SP) after global financial crisis were rejected.” It reveals these explanatory variables of EPS, DY and DPR have significant negative effect on the SP.

### Table 9  
**Correlated Random Effect Model – Hausman Test (2010 – 2016)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-Section Random</td>
<td>8.112</td>
<td>5</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: Authors' Computation.

Here the Table 9 explains the validity of the FEM in this study. The p-value of the Hausman test is (0.000) at the level of 5% d.f., it’s highly significant, further it shows that the Fixed effect model (FEM) was most suitable for appropriate results of this study.
TABLE 10
Summary of Results of the Study

<table>
<thead>
<tr>
<th>Hypotheses Developed</th>
<th>Results/Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H_0^1$: There is no significant relationship between dividend yield (DY) and share price (SP).</td>
<td>Significant</td>
</tr>
<tr>
<td>$H_0^2$: Dividend payout ratio (DPR) and share price (SP) doesn’t have relationship between them.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>$H_0^3$: There is no significant impact of dividend yield (DY) on share price (SP) before global financial crisis.</td>
<td>Significant</td>
</tr>
<tr>
<td>$H_0^4$: Dividend payout ratio (DPR) does not have impact on share price (SP) before global financial crisis.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>$H_0^5$: There is no significant impact of dividend yield (DY) on share price (SP) during the global financial crisis.</td>
<td>Significant</td>
</tr>
<tr>
<td>$H_0^6$: Dividend payout ratio (DPR) does not have impact on share price (SP) during the global financial crisis.</td>
<td>Not Significant</td>
</tr>
<tr>
<td>$H_0^7$: Dividend yield (DY), does not have impact on share price (SP) after the global financial crisis.</td>
<td>Significant</td>
</tr>
<tr>
<td>$H_0^8$: There is no significant impact of dividend payout ratio (DPR) on share price (SP) after the global financial crisis.</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Summary of Findings:

The following results were found from the above analysis:

Correlation matrix of all variables included in the analysis is presented in table 3 which is calculated based on annual data of 10 Automobile firms. The above results show that SP is negatively correlated with DY at the 1 percent level of significance. In addition to that SP is positively correlated with ERR and negatively correlated with LVRG at the significance level of (0.071) and (-0.040) respectively. The correlation matrix further exhibits EPS is positively correlated with ERR at the significance level of (0.008) and DPR has the negative relationship with the DY at the significance value of -0.042.

Before economic recession (2004 – 2007)
- Based on the results of FEM, the explanatory variables of LVRG, EPS and DY has a significant effect on the SP.
- In which the LVRG and DY had the negative impact on the SP. At the same time the EPS has the positive impact on the SP of the Automobile firms during this period.

During the economic recession (2008 – 2009)
- From the FEM outcomes, it clearly indicates the probability values of LVRG, and EPS are significant at the 5% level, further DY significance at the 10% level, and other variables are not significant. This reveals these explanatory variables of LVRG, EPS and DY are generated, remarkable effect on the SP.
- Wherein the LVRG and DY had the negative impact on the SP. At the same time the EPS has the positive impact on the SP of the Automobile firms during this period.

After the economic recession (2010 – 2016)
- The FEM results indicate, the EPS), DY and DPR has the significant as well as negative effect on the SP at the 1 percent level of significance.
- Further the other explanatory variables as LVRG and ERR doesn't create any significant effect on the SP of the firm.
Conclusion:
This year marks the 10th anniversary of the 2008 global financial crisis, the most significant and economic upheaval since the great depression. The financial crisis has caused a considerable slowdown in most developed as well as developing countries. Many developing economies are still growing strongly, but forecasts have been downgraded substantially. This study analysed, how was the dividend policy and market share prices association during the economic recession specifically Automobile sector in India. The FEM analysis shows that before and during the economic recession the EPS has the positive remarkable effect on the SP and after the economic recession it has the negative impact on SP. In the mid partition of during economic recession the EPS has the positive influence on the SP. This examines, EPS has the prominent impact on the SP during all the three division of the study period. Following to the EPS, DY has the significant and adverse effect on the SP during all the three part of study period. The study observed that DPR was insignificant in the period of before and during economic recession, but it was highly significant with SP at negative manner at the after recession period. This indicates the adverse changes happened in DPR during the post economic recession; it generates more deviations in the SP. Further the DY also created more variations in the SP behaviour at the mid and post global economic recession. Hence it was proved in this study, the SP was affected by the dividend policy of the Automobile firms during and the post economic recession period 2010-2016.

Scope For Further Studies:
The study has concentrated on the Automobile sector in India. Here it analyses the single sector of NSE, in particular Automobile Industry with the specified period of time using the selected variables. It will be interesting to choose the various sectors on the NSE or BSE listed firms for analyse the same area of research with the various Statistical tools.

References:


The present paper is an attempt by the researchers to investigate on the causes of bank fragility and formulation of joint management of default risk that is liquidity risk and credit risk taking into consideration the bank specific factors so as to ensure bank stability. The main focus of the study is on the bank specific factors affecting liquidity risk and credit risk in Indian commercial banks. Data are taken from the annual accounts of 50 scheduled commercial banks comprising public sector banks, private sector banks, and foreign banks for a duration of 17 years from 2000-2016. Panel data regression model is applied using E-Views 9 to study the impact of bank specific determinants on the liquidity risk and credit risk. The result of the analysis shows bank size and profitability have significantly affected the liquidity risk and credit risk of the banks in case of public sector banks, and private sector banks.

*Keywords*: Bank Specific factors, liquidity risk, credit risk, Bank stability.
Sustained financial position of the banking industry is of paramount importance for the smooth functioning of economy. The failure of the banking industry to manage its financial soundness will result into increased default risk. Ever since the failure of Lehman brothers in 2008 the Indian economy being a developing economy is exposed to various types of systematic and unsystematic risks, of which liquidity risk and credit risk are major default risk leading to the downfall in the economy. Indeed the Global financial turmoil was a result of failure of banks to maintain liquidity and credit position. The literature review and Basel 3 reveals that an empirical study needs to be conducted so as to ensure joint management of liquidity risk and credit risk as it is very important for sustaining financial stability in the economy. The present paper is an attempt by the researchers to investigate on the causes of bank fragility & formulation of joint management of default risk that is liquidity risk and credit risk taking into consideration the bank specific factors so as to ensure bank stability. The present paper is structured in the following sections. Section 2 states the objectives of the study. Section 3 deals with review of literature. Section 4 outlines the research method and research design. Section 5 contains the data analysis & interpretation & Section 6 states findings, conclusion and future scope of the study. Section 7 enumerates the references.

2. Objectives of the study

a. To study the factors affecting the liquidity risk in Indian Banking Industry,
b. To study the factors affecting the credit risk in Indian Banking Industry, and
c. To form joint risk management framework of liquidity risk and credit risk so as to ensure bank stability.

Justification of the study

The present study will be helpful in increasing the present understanding among the scholars, policy makers, and academicians relating to literature gap. Further it will help in exploring the association of credit risk & liquidity risk with its factors. Moreover it will be beneficial for the regulators in formulating policies from time to time so as to ensure financial stability in the economy.

3. Review of Literature

This section presents the review of literature elaborating the effects of bank specific factors on the liquidity risk & credit risk. The empirical studies are taken as the basis.

Considering the effects of financial crises on the financial stability of the banks, the financial risk assessment & management of banks have gained much importance. The review of literature is studied under two heads:

1) Review of literature relating to Liquidity risk.
2) Review of literature relating to Credit risk.

The studies in the past relating to liquidity risk are quoted as follows. For instance, Singh & Sharma (2016) applied Pooled OLS Regression Method, Trend Analysis, and Panel Data Approach on 59 banks of BRICS Countries over a period of 12 years to analyze the impact of bank specific factors on the banks liquidity. Sheefeni (2016) analysed the bank specific factors affecting the commercial bank's liquidity in Namibia using ordinary least squares (OLS) technique over a period of 14 years and it was revealed that there is a negative link between return on equity & commercial bank's liquidity and a positive relationship between capital adequacy, non-performing assets & commercial bank's liquidity. Umar & Sun (2016) studied the bank specific factors of liquidity risk of the commercial banks CEE Countries over a period of 13 years. Multiple Linear Regression Econometric Model was employed and it was concluded that there is significant relationship of liquidity creation & return on equity, bank size & a negative relation of liquidity creation & interest rate. Shaikh (2015), using Panel Data Approach using fixed effects and random effects on the sample of 5 Banks of Pakistan over a period of 7 years analysed the factors of liquidity risk. Boumediene (2015) applied generalized autoregressive conditional heteroskedasticity model to manage liquidity needs of Islamic banks. Renata (2015) identified the factors of liquidity risk in the 42 developed countries over a period of 12 years using the Panel Data Regression Analysis and the result of the study suggested that the global factors of liquidity will be helpful in managing the liquidity risk. Similar studies were done by El Khoury (2015) taking a sample of 23 banks of Lebane over a period of 9 years & the study highlighted bank size & loan growth as the main factors of liquidity risk. Moussa (2015) investigated the factors affecting bank’s liquidity in Tunisia and the research concluded that bank size, deposits have a negative impact on liquidity whereas return on assets, bank capital have positive impact on the liquidity. Roman & Sargu (2015) analysed the factors of liquidity risk by used OLS Regression Analysis on sample of CEE Countries over a period of 8 years. Ferrouhi (2014) identified the factors of liquidity risk & examined the association between financial performance & liquidity risk.
of commercial banks in Morocco using panel data regression analysis on the sample of 12 years. The study showed positive relationship between bank size and liquidity risk & a negative relationship between external funding total liabilities, bank capital and liquidity risk. Vodova (2013), using Panel Data Regression Approach attempted to study the factors affecting liquidity in Hungarian commercial banks. The research revealed a direct & positive relationship between capital adequacy of banks, interest rate on loans, banks profitability and banks liquidity. Further it revealed a negative relationship between bank size, interest margin, monetary policy, interest rate and banks liquidity. Asongu (2013) studied the steps taken by banks post crisis to manage liquidity risk by investigating the sample of 20 banks. Arif & Nauman (2012) applied series of Multiple Regressions, Panel Data Approach on the sample size of 22 banks of Pakistan over a period of 6 years to study the effect of liquidity on the profitability of the banks and suggested that by maintaining sufficient cash reserve, increasing deposits, decreasing liquidity gaps & non-performing loans will lead to mitigation of liquidity risk. Anjum (2012), made a comparison between liquidity risks of Islamic & Conventional Banks to study the bank specific factors leading to liquidity risk. Regression was applied on a sample of 23 banks for a period of 4 years & it was concluded that Islamic banks depicted a better liquidity position in comparison to conventional banks. Munteanu (2012) studied the factors of bank liquidity in commercial banks of Romania using Regression Analysis and recommended that a decline in inter-bank interest rate will minimise the liquidity risk. Vodova (2011) undertook a study to identify factors of liquidity in the commercial banks of Slovakia. The duration of study was 10 years. Using panel data regression analysis, it was found that negative effect of profitability, capital adequacy, bank size on the banks liquid assets. Buch & Neugebauer (2011) recommended the importance of bank specific factors in maintaining optimum liquidity in the economy. David & Samuel (2011) examined liquidity management in Nigerian banks using OLS Regression Model and concluded that there is significant relationship connecting liquidity and profitability.

The above review of literature concludes that though the liquidity risk is the major cause of bank failure in Indian banking industry, there are limited studies that validate the influence of various factors over the liquidity of Indian Banking Industry.

The studies in the past relating to credit risk are quoted as follows. ARDL approach to study the cointegration and OLS Regression were employed by Nikolaidou & Vogiazas (2017) to analyse the factors affecting the credit risk in the banks mainly focusing on five Central East and South East European countries mainly Kenya, Namibia, South Africa, Zambia and Uganda. The study suggested that increased money supply decreases non-performing loans. Similar study was done using one step - generalized methods of moments (GMM) estimator to investigate upon the factors of credit risk and Panel vector autoregressive (PVAR) model to study the link of credit risk with its factors by Louiachi & Boujelbene (2016) on sample of 117 commercial banks of Middle Eastern, North African (MENA) & Asian countries. Andriani & Wiryono (2015) studied the bank specific factors affecting the credit risk of 69 commercial banks of Indonesia. Ghosh (2015) focused on determining the link between the bank specific factors and credit risk in US states. He concluded that increase in bank size & cost inefficiency significantly increases NPLs, while greater bank profitability lowers NPLs. Chihi & Fitti (2015) conducted a study for a duration of 7 years to study the factors affecting the non-performing loans (NPL’S) of commercial banks of France and Germany respectively. GMM Estimator was applied on the unbalanced panel dataset. The result of analysis concluded that the loan loss provisions and inefficiency are major causes of risks in French banks' while the bank's leverage is major cause NPLs in German banks. Adu & Adjare (2015) made an attempt to investigate upon the causal factors of credit risk in the commercial banks of Ghana over a period of 8 years .The study was based on the bank specific factors such as bank size, credit risk, leverage, management efficiency, & profit. The study showed significantly positive relationship between the bank credit risk and leverage & a negative relationship of credit risk with the management efficiency and profitability. In India Dhar & Bakshi (2015) did a study to investigate upon the bank specific factors of credit risk in Public sector banks by employing panel data approach and found that net interest margin, credit- deposit ratio, investment deposit ratio, capital adequacy has negative effect on the non-performing loans. On the other hand, profitability has positive affect on the non-performing loans. Ouertani & Ghorbel (2014) focused on 16 Tunisian banks over a period of 10 years from 2003-2012 to investigate upon the factors such as Return on Equity, Solvency Ratio, Inefficiency, and Size. He applied dynamic panel data approach of Econometrics specification. The study suggestion that attention needs to put on the stress testing on varied loan portfolios. Similar studies were conducted by Nikolaidou & Vogiazas (2014) using time series analysis and then used an autoregressive distributed
A Quarterly Journal

lag model to study the factors of credit risk in the banking industry of Bulgaria. They concluded that credit risk is significantly affected by the Loss loan provisions to total loans. Misman (2013) conducted a study on a sample size of 17 Islamic banks of Malaysia to assess / investigate the factors of credit risk. The duration of the study is 17 years from 1995 – 2011. The result of the analysis concludes that the Bank size have a positive & significant association with the credit risk, there is negative association between the capital ratio and the credit risk. Similar study was done by Ahmad et.al (2013) to find out the significance associated of credit risk with bank specific factors in Gulf countries. The result of his study showed that risky assets in portfolio, liquidity, management efficiency have significant effect on the credit risk in comparison to other prevalent factors. Correlation of credit risk changes by applying regression analysis was studied by Zhao (2012) and suggested that it is very essential to examine the factors affecting the credit risk. Similar study was done by Louzis et al. (2010) to analyse the factors of credit risk in Greek banks using fixed effect models and revealed that efficiency & performance were significantly affecting the credit risk of the banks. Das & Ghosh (2007) performed a similar study in context to Indian state owned banks and concluded that credit risk is significantly influenced by bank specific variables. Ahmad & Arif (2007) conducted research in Australia, France, Japan and US and the emerging economies comprises India, Korea, Malaysia, Mexico and Thailand. The study entailed the regulatory capital as an important indicator of banking systems which is further a critical factor determining the management quality in emerging economies.

The above review of literature concludes that there are limited studies that validate the influence of various factors over the credit risk of Indian Banking Industry. Imbierowicz & Rauch. (2014) attempted a study in US to examine the association between major bank default risk i.e Liquidity risk & Credit risk. The findings of study concluded that both Liquidity risk & Credit risk lead to increased probability of default in the banks & recommended the need to make joint management of Liquidity risk & Credit risk so as to ensure stability in banking systems.

Reviewing the literature on the liquidity risk & credit risk, it has been drawn that there has been scarcity of studies relating to joint risk management of liquidity risk & credit risk in the developing or underdeveloped countries. Indeed it can be said the studies pertaining to these risks have done in the developed countries.

Therefore the present study aimed at studying the factors of Liquidity risk & Credit risk and their probable impact in context to Indian commercial banks so that joint risk management could be aimed at.

4. Research method & research design.

The aim of the paper is to study the bank default risk in India so that joint risk management policy could be formulated which will be a step towards sustaining financial soundness of banking industry.

Research Design

Research design is a cluster of steps involved in carrying out research. The research problem was analysed by application of descriptive research design.

Target population & sample size

The target population for the present study is scheduled commercial banks of India & the sample size is 50 banks (including 24 public sector banks, 15 private sector banks & 11 foreign banks) for a period of 17 years from 2000- 2016.

Proxy Measurement of Variables

Dependent Variables: Liquidity risk & Credit risk are taken as dependent variables.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Proxy Measurement</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquidity Risk</td>
<td>Quick assets / Deposits</td>
<td>Sheefeni (2016); Singh &amp; Sharma (2016); Munteanu (2012); Khoury (2015)</td>
</tr>
<tr>
<td>Credit Risk</td>
<td>Total Loan / Total assets</td>
<td>Vazquez et.al (2012) ; Altman et.al (1998)</td>
</tr>
</tbody>
</table>
Explanatory Variables | Proxy Measurement | Citations
---|---|---
Bank size | Logs of total assets | Vodová, (2011); Sheefeni (2016); Chiaramonte, et.al. (2017); Chouchène et.al (2017); Roman & Sargu (2015); León et.al (2016); Singh & Sharma (2016); Ch, L. K. (2013); Arif, et.al. (2012); El Khoury (2015); Ferrouhi, E. M. (2014); Vodova (2014); Iqbal (2012)
Profitability | Return on capital employed | Vodová, (2011); Sheefeni (2016); Chiaramonte, et.al. (2017); Chouchène et.al (2017); Roman & Sargu (2015); León et.al (2016); Singh & Sharma (2016); Moussa (2015); Choon (2013); Vodov (2013); Arif, et.al. (2012); Khoury (2015); Ferrouhi (2014); Vodova (2014); Iqbal (2012)
Capitalization ratio | Total capital/total assets | Chouchène, et.al (2017)
Funding Cost | Interest expense / total deposits | Singh & Sharma (2016)
Operational efficiency | Operating expense / total assets | Boadi et.al. (2016); León et.al (2016)

Data collection & Research Methodology
(Model specification)
The data is collected from PROWESS database (CMIE) & panel data Regression Model is applied using E-views 9.

5. Data analysis & interpretation
The main aim of the paper was to study factors of liquidity risk & credit risk in Indian commercial banks so that financial soundness could be maintained. This section deals with the empirical analysis and interpretation of the data. The data in the study will be tested for normality of the variables, correlation analysis, followed by analysing the data, using panel data Regression Model.

a. Descriptive analysis: This is done to check the normality of data distribution. The mean-median ratio for dependent and independent variable is computed separately and it indicates normality of data and which further confirms that the empirical analysis can be conducted using the panel data.

b. Correlation analysis: This is done in order to explain correlation between the dependent variables and the independent variables. Higher degree of correlation is not acceptable. For the present study all the variables depicted that coefficient less than 0.3, which further revealed that no multicollinearity exists between the variables.

c. Empirical Analysis Pooled Regression Model: Applying pooled regression model signifies the homogeneity of the banks under the study. The analysis is segregated into 4 parts:

| Table 1 & 1A | Depicts impact of bank specific factors on the liquidity risk of the overall Indian banking industry.
| Table 2 & 2A | Depicts impact of bank specific factors on the credit risk of the overall Indian banking industry
| Table 3 & 3A, 3B, 3C | Depicts impact of bank specific factors on the liquidity risk of public sector banks, private sector banks, and foreign banks separately.
| Table 4 & 4A, 4B, 4C | Depicts impact of bank specific factors on the credit risk of public sector banks, private sector banks, foreign banks separately
1. Impact of bank specific factors on the liquidity risk of the overall Indian banking industry:

In table 1, the liquidity risk is taken as dependent variable and factors such as funding cost, bank size, profitability, capitalisation and operating efficiency are taken as independent variables. The result of the analysis depicts that, profitability, capital adequacy ratio are the significant factors influencing liquidity risk in all the Indian commercial banks as the P-Value is less than 5%.

Further the fixed effects estimates are computed which depicts bank size, capital adequacy ratio have significant effect on the liquidity risk as its P-value is less than 5%. Funding cost, profitability, operating efficiency are insignificantly affecting the liquidity risk. Random effect estimates concluded that profitability, capital adequacy ratio are significantly influencing liquidity risk as the P-value is less than 5%. on the other hand, Funding cost, bank size, operating efficiency has negative impact on the liquidity risk.

Besides this Fixed effects estimates shows R-squared value as 0.58 in comparison to random effects model which shows R-squared value as 0.308, which is an indication that fixed effect estimation have more explanatory power in comparison to the random effect model. The Durbin Watson value of 1.58 in case of fixed effects is an indication of absence of autocorrelation.

<table>
<thead>
<tr>
<th>Table-1 Regression analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C (LIQ_Risk)</td>
</tr>
<tr>
<td>COF</td>
</tr>
<tr>
<td>SIZ</td>
</tr>
<tr>
<td>ROCE</td>
</tr>
<tr>
<td>CAR</td>
</tr>
<tr>
<td>OPR_EFF</td>
</tr>
<tr>
<td>R- Squared</td>
</tr>
<tr>
<td>Adjusted R Squared</td>
</tr>
<tr>
<td>Prob (F-Statistics)</td>
</tr>
<tr>
<td>Durbin Watson Stat</td>
</tr>
</tbody>
</table>

Note: LIQ_Risk is the ratio of quick assets over total deposits. SIZ is bank size, ROCE is profitability, COF is cost of funding, CAR capital adequacy ratio, OPR_EFF is operational efficiency. Sample: 2000 2016
Periods included: 17
Cross-sections included: 50
Total panel (balanced) observations: 850 Source: Author's Compilation.

Further the Hausman Test was applied for choosing the most reliable test between the fixed effect estimates and random effect estimates. As the P-value is less than 0.05, it concludes that fixed effect estimates is more appropriate as compared to random effect estimates

<table>
<thead>
<tr>
<th>Table 1A Hausman test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Summary</td>
</tr>
<tr>
<td>Cross section Random</td>
</tr>
</tbody>
</table>
2. Impact of bank specific factors on the credit risk of the overall Indian banking industry:

In table 2, the Credit risk is taken as dependent variable and all other factors such as funding cost, bank size, profitability, capitalisation and operating efficiency are taken as independent variables. The result of the analysis depicts that funding cost, bank size, profitability, capital adequacy ratio are significant factors influencing credit risk in all the Indian commercial banks as the P-Value is less than 5%.

Further fixed effects estimates are computed. As per fixed effect funding cost, bank size, profitability have significant affect on the credit risk as its P-value is less than 5% Capital adequacy ratio, operating efficiency are insignificantly affecting the credit risk. Random effect estimates concluded that funding cost, bank size, profitability are significantly influencing credit risk as the P-value is less than 5%. on the other hand capital adequacy ratio, operating efficiency has negative impact on the credit risk.

Besides this Fixed effects estimates shows R-squared value as 0.69 in comparison to random effects model which shows R-squared value as 0.416, which is indication that fixed effect estimation have more explanatory power in comparison to the random effect model. The Durbin Watson value of 0.72 in case of fixed effects is an indication of absence of autocorrelation.

### Table 2 Regression analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Panel data</th>
<th>Fixed effects estimates</th>
<th>Random Effect estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>co-efficient</td>
<td>t-statistics</td>
</tr>
<tr>
<td>C (CREDIT_Risk)</td>
<td>36.99381</td>
<td>11.28449</td>
<td>-27.46593</td>
</tr>
<tr>
<td>COF</td>
<td>-1.654267</td>
<td>-8.764978</td>
<td>-0.893838</td>
</tr>
<tr>
<td>SIZ</td>
<td>4.601328</td>
<td>8.749460</td>
<td>15.38510</td>
</tr>
<tr>
<td>ROCE</td>
<td>-0.232758</td>
<td>-4.763129</td>
<td>-0.181443</td>
</tr>
<tr>
<td>CAR</td>
<td>-0.518734</td>
<td>-8.745421</td>
<td>0.135714</td>
</tr>
<tr>
<td>OPR_EFF</td>
<td>0.006000</td>
<td>0.399120</td>
<td>0.021767</td>
</tr>
</tbody>
</table>

Note: CREDIT_Risk is the ratio of Total loans over total assets. SIZ is bank size, ROCE is profitability, COF is cost of funding, CAR capital adequacy ratio, OPR_EFF is operational efficiency.

Sample: 2000 2016
Periods included: 17
Cross-sections included: 50
Total panel (balanced) observations: 850
Source: Author's Compilation.

Further the Hausman Test was applied for choosing the most reliable test between the fixed effect estimates and random effect estimates. As the P-value is less than 0.05, it concludes that fixed effect estimates is more appropriate as compared to random effect estimates.

### Table 2A Hausman test

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Square Statistics</th>
<th>Chi Square Degree of freedom</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross section Random</td>
<td>159.66</td>
<td>5</td>
<td>0.00</td>
</tr>
</tbody>
</table>
3. Impact of bank specific factors on the liquidity risk of public sector banks, private sector banks, and foreign banks separately.

Table 3 depicts effect of independent variables such as funding cost, profitability, capitalization, bank size, operational efficiency on the liquidity risk in public sector banks, private sector banks and foreign banks among the Indian scheduled commercial banks.

Table 3 Regression Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Public sector banks</th>
<th>Private sector banks</th>
<th>Foreign banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>C (LIQ_Risk)</td>
<td>0.0040</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>COF</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0016</td>
</tr>
<tr>
<td>SIZ</td>
<td>0.0435</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>ROCE</td>
<td>0.0076</td>
<td>0.3287</td>
<td>0.0835</td>
</tr>
<tr>
<td>CAR</td>
<td>0.4347</td>
<td>0.4601</td>
<td>0.3879</td>
</tr>
<tr>
<td>OPR_EFF</td>
<td>0.1702</td>
<td>0.4472</td>
<td>0.6387</td>
</tr>
<tr>
<td>R- Squared</td>
<td>0.111</td>
<td>0.219</td>
<td>0.456</td>
</tr>
<tr>
<td>Adjusted R - Squared</td>
<td>0.100</td>
<td>0.209</td>
<td>0.416</td>
</tr>
<tr>
<td>Prob (F Statistics)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Durbin Watson Stat</td>
<td>0.744</td>
<td>0.903</td>
<td>1.146</td>
</tr>
</tbody>
</table>

Source: Author's Compilation.

The above table depicts the factors influencing liquidity risk in public sector banks, private sector banks and foreign banks.

1. Public sector banks:

The result of the Pooled regression analysis depicts that, profitability, bank size, funding cost are the significant factors influencing liquidity risk in the public sector banks as the P-Value is less than 5%. Further fixed effect estimates are computed which shows funding cost, bank size have significant affect on the liquidity risk as its P-value is less than 5%. Profitability, capital adequacy ratio, operating efficiency are insignificantly affecting the liquidity risk.

Random effect estimates concluded that funding cost ,bank size are significantly influencing liquidity risk as the P-value is less than 5%. Besides this Fixed effects estimates shows R-squared value as 0.456 in comparison to random effects model which shows R-squared value as 0. 219, which is indication that fixed effect estimation have more explanatory power in comparison to the random effect model. The Durbin Watson value of 1.146 in case of fixed effects is an indication of absence of autocorrelation.

Further Hausman test is applied for choosing the most reliable test between the fixed effect estimates and random effect estimates.

Table 3A Hausman Test

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Square Statistics</th>
<th>Chi Square Degree of freedom</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross section Random</td>
<td>92.08</td>
<td>5</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Since the p value being less than 0.05, the acceptance of fixed effects over the random effect is confirmed.
2. Private sector banks:
The result of the Pooled regression analysis depicts that bank size, capital adequacy ratio are the significant factors influencing liquidity risk in the public sector banks as the P-value is less than 5%.

Further fixed effect estimates are computed which depicts profitability, bank size have significant effect on the liquidity risk as its P-value is less than 5%. Funding cost, capital adequacy ratio, operating efficiency are insignificantly affecting the liquidity risk. Random effect estimates concluded that profitability, bank size are significantly influencing liquidity risk as the P-value is less than 5%. Besides this Fixed effects estimates shows R-squared value as 0.424 in comparison to random effects model which shows R-squared value as 0.238, which is indication that fixed effect estimation have more explanatory power in comparison to random effect model. The Durbin Watson value of 1.04 in case of fixed effects is an indication of absence of autocorrelation.

Further Hausman test is applied for choosing the most reliable test between the fixed effect estimates and random effect estimates.

<table>
<thead>
<tr>
<th>Table 3B Hausman Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Summary</strong></td>
</tr>
<tr>
<td>Cross section Random</td>
</tr>
</tbody>
</table>

Since the p value being more than 0.05, the random effects were accepted in comparison to fixed effects.

3. Foreign banks:
The result of the Pooled regression analysis depicts that profitability, capital adequacy ratio are the significant factors influencing liquidity risk in the public sector banks as the P-value is less than 5%.

Further the fixed effect estimates are applied which shows capital adequacy ratio, profitability have significant effect on the liquidity risk as its P-value is less than 5%. Random effect estimates concluded that profitability and capital adequacy ratio are significantly influencing liquidity risk as the P-value is less than 5%. Besides this Fixed effects estimates shows R-squared value as 0.496 in comparison to random effects model which shows R-squared value as 0.452, which is an indication that fixed effect estimation have more explanatory power in comparison to the random effect model. The Durbin Watson value of 1.65 in case of fixed effects is an indication of absence of autocorrelation.

Further Hausman test is applied for choosing the most reliable test between the fixed effect estimates and random effect estimates.

<table>
<thead>
<tr>
<th>Table 3 C Hausman Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Summary</strong></td>
</tr>
<tr>
<td>Cross section Random</td>
</tr>
</tbody>
</table>

Since the p value being more than 0.05, the fixed effects estimates are accepted in comparison to random effects.

4. Impact of bank specific factors on the Credit risk of public sector banks, private sector banks, and foreign banks separately.

Table 4 depicts effects of independent variables such as funding cost, profitability, capitalization, bank size, operational efficiency on the credit risk in public sector banks, private sector banks and foreign banks among the Indian scheduled commercial banks.
Table 4 Regression Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Public sector banks</th>
<th>Private sector banks</th>
<th>Foreign banks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0000</td>
<td>0.0014</td>
<td>0.0000</td>
</tr>
<tr>
<td>COF</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>SIZ</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>ROCE</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0583</td>
</tr>
<tr>
<td>CAR</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.1443</td>
</tr>
<tr>
<td>OPR_EFF</td>
<td>0.0571</td>
<td>0.5183</td>
<td>0.1868</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.55</td>
<td>0.704</td>
<td>0.840</td>
</tr>
<tr>
<td>Adjusted R-Squared</td>
<td>0.100550</td>
<td>0.7012</td>
<td>0.830</td>
</tr>
<tr>
<td>Prob (F-Statistics)</td>
<td>0.000</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Durbin Watson Stat</td>
<td>0.420</td>
<td>0.463</td>
<td>0.667</td>
</tr>
</tbody>
</table>

Source: Author's compilation.

1. Public sector banks:

The result of the pooled regression analysis depicts that, profitability, bank size, funding cost, capitalization are the significant factors influencing credit risk in the public sector banks as the P-Value is less than 5%.

Further the fixed effects estimates revealed that funding cost, bank size have significant effect on the credit risk as its P-value is less than 5%. Profitability, capital adequacy ratio, operating efficiency are insignificantly affecting the credit risk. Random effect estimates concluded that funding cost, bank size and profitability are significantly influencing credit risk as the P-value is less than 5%. Besides this Fixed effects estimates shows R-squared value as 0.840 in comparison to random effects model which shows R-squared value as 0.705, which is an indication that fixed effect estimation have more explanatory power in comparison to the random effect model. The Durbin Watson value of 0.668 in case of fixed effects is an indication of presence of autocorrelation.

Further Hausman test is applied for choosing the most reliable test between the fixed effect estimates and random effect estimates.

Table 4 A Hausman Test

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Square Statistics</th>
<th>Chi Square Degree of freedom</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross section Random</td>
<td>260.099</td>
<td>5</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Since the p value being more than 0.05, the fixed effects estimates are accepted in comparison to random effects.

2. Private sector banks:

The result of the pooled regression analysis depicts that bank size, capital adequacy ratio are the significant factors influencing credit risk in the private sector banks as the P-value is less than 5%.

Further the fixed effects estimates revealed that profitability, bank size, Funding cost, capital adequacy ratio have significant effect on the credit risk as its P-value is less than 5%. Operating efficiency is insignificantly affecting the credit risk. Random effect estimates concluded that funding cost and profitability, bank size are significantly influencing credit risk as the P-value is less than 5%. Besides this Fixed effects estimates shows R-squared value as 0.757 in comparison to random effects model which shows R-squared value as 0.589, which is indication that fixed effect estimation are more reliable in comparison to the random effect model. The Durbin Watson value of 0.84 in case of...
fixed effects is an indication of absence of autocorrelation. Further Hausman test is applied for choosing the most reliable test between the fixed effect estimates and random effect estimates.

### Table 4B Hausman Test

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Square Statistics</th>
<th>Chi Square Degree of freedom</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross section Random</td>
<td>87.337</td>
<td>5</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Since the p value being more than 0.05, the fixed effects estimates are accepted in comparison to random effects.

3. **Foreign banks:**

The result of the pooled regression analysis depicts that profitability, capital adequacy ratio are the significant factors influencing credit risk in the foreign banks as the P-value is less than 5%.

Further the fixed effects estimates revealed that capital adequacy ratio, profitability have significant effect on the credit risk as its P-value is less than 5%. Random effect estimates concluded that profitability, capital adequacy ratio are significantly influencing credit risk as the P-value is less than 5%. Besides this Fixed effects estimates shows R-squared value as 0.496 in comparison to random effects model which shows R-squared value as 0.452, which is indication that fixed effect estimation have more an explanatory power in comparison to the random effect model. The Durbin Watson value of 1.65 in case of fixed effects is an indication of absence of autocorrelation.

Further Hausman test is applied for choosing the most reliable test between the fixed effect estimates and random effect estimates.

### Table 4C Hausman Test

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Square Statistics</th>
<th>Chi Square Degree of freedom</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross section Random</td>
<td>159.6</td>
<td>5</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Since the p value being more than 0.05, the fixed effects estimates are accepted in comparison to random effects.

**Discussion, conclusions & scope of future study**

**A. Discussion**

In this paper an attempt is made to study the relationship between liquidity risk /credit risk and its factors. The study considered liquidity risk and credit risk as dependent variables and bank specific factors such as funding cost, bank size, capitalization, profitability, operational efficiency as the independent variables.

Empirical findings highlights that at 5% significance level, capital adequacy ratio & bank size has significant effect on the liquidity risk of the overall Indian Scheduled Commercial banks that is 50 banks including 15 private sector banks, 24 public sector banks, 11 foreign banks. Besides this it is seen that funding cost, bank size, and profitability has significant effect on the credit risk of overall Indian Scheduled Commercial banks.

Separate analysis of the Indian commercial banks, reveals the following:-

a. In case of public sector banks funding cost, bank size are the most significant factors having significant impact on the liquidity risk and credit risk.

b. In case of private sector bank, banks size, and profitability have significant effect on the both liquidity risk & credit risk. Besides this even funding cost and capital adequacy ratio have significant impact on the credit risk.

c. In case of foreign banks profitability and capital adequacy have significant effect on the liquidity risk and credit risk. Whereas funding cost, bank size, and operational efficiency have insignificant effect on the credit risk and liquidity risk.

Thus effort should be taken by the policy makers in the banks to ensure that timely measures should be taken to curb the negative impact of all the significant factors impacting the banking industry.
B. Conclusion & Suggestions

A strong liquidity position and credit policy of banking industry is of paramount importance for the smooth functioning of the economy. The literature reveals that very limited research in context to Indian banking industry has been taken so far. Therefore, the present study has a significant implications and will be valuable for banks managers and policy makers in developing appropriate strategies to maintain adequate liquidity and credit relating policies in the banks. Moreover from the extensive literature review it is revealed that there were paucity of studies been conducted in Indian context relating to joint risk management of both liquidity risk and credit risk and particularly considering separately and overall impact of (public sector banks, private sector banks, foreign banks) in relation to bank specific factors. Thus this will be beneficial in facing the future uncertainties. Thus, it will pave way in attaining sustainable growth & development in the economy.

C. Scope of future study

In future, study could even be conducted considering even the macro economic factors & bank specific factors influencing liquidity risk & credit risk so as to have holistic view of all the factors so as to form better risk management strategies.

Present study is a compiled review comprising references for which papers cited may be referred.

References


**************
The objective of the study is to explore the dynamic relationship amid financial expansion, economic growth and international trade for MINT (Mexico, Indonesia, Nigeria & Turkey), an emerging economic unit in the globe. Using Panel Vector Auto Regression modeling techniques and Impulse Response Functions, the research analyses how financial expansion boosts economic growth & vice versa. The outcome reveals that economic progression drives production & that in turn develops financial sector. Further, the result exposes that even though stock market growth for the MINT group is nascent, it contributes significantly to financial development. The dynamic behavior among the financial & growth variables illustrate that a shock in broad money affects economic growth immediately for a short period along with stock market. A similar change in growth leaves a notable impact on domestic credit & on international trade. The results will help policy makers to strategize monetary & fiscal policies of these four nations.

**Keywords:** Panel VAR, Panel Unit root test, Panel Co-integration, Dynamic interactions, MINT Economy.
Mexico, Indonesia, Nigeria & Turkey have received the recognition as a composite emerging economy, known as 'MINT, as they share certain commonality in terms of population & economic condition (Adeolu, 2013; Boesler, 2013; Fraser, 2011; Magalhaes, 2013; Wright 2014). The strategic locations of these four nations have helped them to engage in international trade: Turkey is in trade agreements with countries from Asia & Africa; Mexico, being the largest economy in Latin America, exports 75% of its trade items to the US & boosts their GDP by 3.5% per annum (Breard, 2015); Indonesia receives high demand for raw materials; and Nigeria is growing with high fuel demand. These countries have high prospects for growth in terms of urbanization, technology, infrastructure, energy and human capital. This economic unit is characterized with favorable young population with the propensity to earn and spend with an increase in consumption levels and rising income levels. These four countries also have good legal systems conducive for commercial growth. Most importantly, MINT is recognized as top four countries in the panel of N-11 (Next-Eleven), as it jointly constitutes 73% of total GDP of N-11 group (Adibe, 2014). Given the prospects for a good and a positive economic growth, the MINT nations have grabbed the attentions of academicians and policy makers and that has triggered us to choose MINT as the platform of our study.

The Schumpeterian theory of 'supply leading hypothesis' and the reverse theory of 'demand following hypothesis' have been debated to a great extent by the researchers across the globe. The investigators always debate the issue whether financial development leads to economic growth or growth leads to financial development, i.e. they essentially discuss the direction of relationship between the two macroeconomic environments; however, scarcity of literature reflects the dynamic aspects of such relationships and also the type and nature of the economy which might play a major role in determining the dependency of it. The present study contributes in this aspect as it examines the finance-growth nexus for MINT, the emerging economic unit in the globe.

While economic growth is indicated by GDP, financial development of a nation can be measured by the size of the financial system, access to various financial products, efficiency of the intermediaries in intermediating resources and stability of the financial institutions and markets. Financial intermediaries help in addressing the lack of synchronization between net savers and net borrowers by mobilizing savings and promoting investments of a country. Flow of income is required to service debt or increase the borrowing capacity of the nation. The gap between payments and receipts could be filled only when any individual, business or government get access to a diversified range of financial instruments catering to their long-term, medium term and short term needs accordingly.

This study seeks to investigate the finance-growth connections in MINT as a composite unit. It intends to explore the relationship between the proxy variables of growth and finance in a dynamic environment using the panel Vector Autoregressive model. This work attempts to focus on new insights in terms of policy implications that may have certain positive impacts on these countries.

Going forward, the paper is organized in the following sequence: Section 2 reviews prior research carried out in the area of finance-growth relationship; Section 3 describes the research methodology adopted in the study; Section 4 discusses the results & findings; and finally section 5 draws the conclusion.

Review of literature

In the early 19th century, Schumpeter initiated the arguments regarding the relationship between financial development & economic growth and thereafter researchers took it forward through empirically testing the relationships across the economies. Raymond Goldsmith (1969) in his book “Financial Structure and Development” suggests that legal, regulatory & policy reforms boost the functioning of markets and banks, and not the financial structure, as he classifies bank-based & market-based financial structure very categorically (Macesich, 1970). Researchers have criticized his thoughts. Rajan and Zingales (1998) argue that financial development, driven by economic growth, has a larger impact on small firms than those of large firms, as economic growth helps to reduce the cost of external finance. They also opine that financial development helps to set up new firms through innovation & growth. In line with these findings, Thorsten Beck et al. (2008) indicate that the growth of small firms may get highly affected with underdeveloped & unstructured financial system of the economy.

To understand the causal relationship between finance and growth, researchers re-emphasize on the Schumpeterian 'supply-leading' hypothesis. King and Levine (1993) and Shabir (1997) support Schumpeter's view & prove with empirical evidence that financial intermediation leads to

Another stream of empirical research supports the 'demand-following' hypothesis. Odhiambo (2004) studies the finance growth nexus for South Africa and concludes that economic growth drives financial sector development. Rafindadi and Yusuf (2013) indicate that even though financial development does not lead to growth of GDP in African countries, it boosts South Africa's trade openness; further, domestic credit issued by banks has encouraged growth during 1980–2011. However, Adusei's (2014) study of twenty-four African countries proves a one-way relationship flowing financial development to economic growth during 1981–2010. Habibullah (1999) conducts a similar study showing the causal directions between finance and growth for six countries including Malaysia, Myanmar, Nepal, Indonesia, Sri Lanka and Thailand. The author confirms the demand-following hypothesis in the cases of Malaysia, Myanmar and Nepal as there exists a unidirectional causality from economic growth to financial development; however, he finds a bi-directional causality in Indonesia and Sri Lanka; and no causal relationships is found in Thailand.

A bidirectional causality between financial development and economic growth is exhibited in yet another stream of empirical findings (Akinboade, 1998; Blanco, 2009; Demetriades and Luintel, 1996; Wood, 1993). Jung (1986) proves that the direction of the causality between financial development and economic growth depends on the usage of the two variables including currency ratio and monetization variable. By using the currency ratio, less developed countries (LDC) display the supply-leading causality pattern and the developed countries (DC) exhibit the demand-following causality pattern. However, the monetization variable does not differentiate the causal direction between the DC's and LDC's. Chukwu and Agu (2009) observe multiple causal relationships between financial deepening and economic growth. Apergis, Filippidis and Economidou (2007) opine that financial deepening has a bi-directional relationship with economic growth for OECD countries, which is consistent with the findings of Acaravci, Ozturk and Acaravci (2009) who study the similar relationship for twenty-four African countries.

**Research Gap**

In general, existing research in this area provides evidence on unidirectional, bidirectional and multidirectional causality between financial development and economic growth. However, there is more scope for studying the dynamic interrelationships between the finance-growth variables. This is required because in the real world scenario, it is important to have the knowledge about shocks created by one variable and its impact on other variables. It is also important to understand the impact created by each of the variables simultaneously on each other variables to get a broader picture of the happenings. As pointed out by Torbira L. Lenee et al. (2017) that development in capital market boosts the private sector of emerging economies like MINT & this push in turn raises the standard of living leading to more demand, more production and finally more growth. However, evidences (Wright, 2014) show that Nigeria is suffering from political & security issues, despite the fact that the economy has been growing at the rate of 7% since 2000. Similarly, Turkey is facing imbalances in its external front in spite of its high growth. Indonesia & Mexico, in contrast, are growing through market-friendly reforms. Therefore, the question arises whether development in financial sector can really boost economic growth of MINT nations, the unit which is gaining importance as commodity producer & transit economy. As scanty of literature available for MINT nations, the present study has addressed this research question.

**Research Objectives**

The objective of the current study is to understand the interrelationships between economic growth, financial development indicators and trade in a dynamic environment and to measure the impact of simultaneous changes of these variables on other variables.

**Research Methodology**

There is broad knowledge on statistical tools, used by researchers, is available to understand the relationship between finance and growth. The present study deploys Panel Vector Autoregressive model to study the dependencies between economic growth & financial development of MINT nations. Dynamic interactions are studied using impulse response functions.

**Data Collection & Data Structure**

Data has been extracted from the World Bank website for a period of 1991 to 2015. This sample period of twenty-five
years was chosen as it had been an era of financial liberalization in many nations of the world. Especially for the emerging economy, a well-structured capital market system and financial institutions got evolved during this period along with growth, expansion and increasing volume of investments. Further, the time period consists of twenty-five years indicate a substantial period for examining the effect of various changes that the present study has carried out using panel VAR analysis. Four economies including Mexico, Indonesia, Nigeria & Turkey constitute the cross section; whereas the period spanning from 1991 to 2015 form the time-series of the panel. The analysis is carried out in EVIEWS (Version 7.0) environment.

3.2 Operationalization of Variables

On reviewing the literature on the selection of variables, the proxies used for economic growth and financial development are available in abundance. The results of the empirical analyses too vary based on the usage of proxies. Rajan and Zingales (1998) used the capitalization ratio \([\text{Domestic Credit} + \text{stock market capitalization})/\text{GDP}\] as one of the financial development indicators. The monetization variable, the ratio of broad money (M2) to gross domestic product (GDP), currency ratio which is the ratio of currency (CC) to narrow money (M1) and the ratio of bank claims on private sector to nominal GDP (i.e., DCP/GDP) were employed by Odiambo (2004) for Africa. Ceterolli and Gambera (2012) used bank concentration as a variable and studied its effect on growth.

Ghimire and Giorgioni (2013) find the impact of banks and stock market on economic growth for thirty-seven years across one hundred and twenty countries. The study has empirically tested the cross correlations between GDP change and stock market indices in the U.S. and France to show that the stock market movements act as an indicator to economic growth. Yu, Hassan and Sanchez (2012) find that there exists a strong link between financial development, stock market development and economic growth. Demetriades and Luintel (1996) analyze the causal effects of financial deepening and economic growth using banking sector controls and suggest that it is a good measure.

The present study adopts domestic credit to private sector, stock traded turnover ratio, broad money & trade as indicators of financial development whereas gross domestic product has been considered as proxy measure for economic growth. The variables for financial development have been selected based on the size of the financial market, access to the market, efficiency and stability of the market. The operationalization of the variables is stated in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable Name</th>
<th>Definition of the variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCPS</td>
<td>Domestic Credit to Private Sector by banks (% of GDP)</td>
<td>Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises.</td>
</tr>
<tr>
<td>STTR</td>
<td>Stock Traded Turnover Ratio</td>
<td>Turnover ratio is the total value of shares traded during the period divided by the average market capitalization for the period. Average market capitalization is calculated as the average of the end-of-period values for the current period and the previous period.</td>
</tr>
<tr>
<td>DEPTH</td>
<td>Broad money (% of GDP)</td>
<td>Broad money is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler’s checks; and other securities such as certificates of deposit and commercial paper.</td>
</tr>
<tr>
<td>TRADE</td>
<td>Trade (% of GDP)</td>
<td>Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.</td>
</tr>
<tr>
<td>LGDP</td>
<td>Log of GDP per capita</td>
<td>GDP per capita is gross domestic product divided by midyear population. 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. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.</td>
</tr>
</tbody>
</table>

Source: World Bank
The Financial Depth indicator measures the overall size of the financial market system. We use Broad money (as percentage of GDP) to measure financial depth. DCPS (Domestic credit to private sector by banks as percentage of GDP) explains the vitality of banks providing domestic credit as compared to the central bank. We chose this variable as one of the financial development indicators as banks offer information services to have better risk management in relation to central banks. (King and Levine, 1993). Various studies (Beck, Levine, and Loayza, 2000; King and Levine, 1993) measure economic growth in terms of real per capita GDP growth, real per capita capital growth and productivity growth. The proxy, used to measure economic growth in our analysis, is real GDP per capita measured as the log of GDP per capita (LGDP) (Barro, 2003). With respect to 'Trade' and its impact on growth, Kim, Lin and Suen (2010) conclude that Financial Depth has a positive impact on international trade, whereas banking crisis and volatility have a negative impact on trade. We use TRADE (as percentage of GDP) as the variable to measure trade in our analysis.

Research Hypotheses

As the key objective of the research is to evaluate the direction of relationship between economic growth & financial development, the study tests the following hypotheses in which all the six key variables have been taken as both independent variables as well as dependent variables. We have examined the following hypotheses using Panel VAR analysis.

H1: GDP encourages Domestic Credit to Private Sector by Banks
H2: GDP has a positive impact on Stock Traded Turnover Ratio
H3: GDP has a positive impact on Trade of the economies
H4: GDP has a positive impact on Broad Money.
H5: Domestic Credit to Private Sector has a positive impact on GDP.
H6: Stock Traded Turnover Ratio encourages GDP.
H7: Trade has a positive effect on GDP.
H8: Broad Money affects GDP positively.

Econometric Models

The analyses of dynamic interactions between financial indicators & economic growth for the MINT nations are carried out through building three distinct econometric models, including panel unit root test, panel co-integration and panel VAR.

Panel Unit Root Test

As estimation of causality between multivariate time-series requires the stationarity of time-series, we have performed Panel Unit Root Test to examine the stationarity of the series. The test examines the null hypothesis that the series has a unit root, indicating that the series is non-stationary at level. According to Beyaert and Camacho, 2008; Im, Pearson and Shin, 1997; Levin, Lin and Chu, 2002; Maddala and Wu, 1999; Pesaran, 2006; Taylor and Sarno, 1998, panel unit root test is extremely useful & important as it carries both cross-section & time-series dimension in testing the roots. The current study has adopted the most commonly used unit root tests for panel data, namely, Levin-Lin-Chu ((LLC), Im-Pesaran-Shin (IPS) test, Breitung & Hadri Test (BT), Augmented Dickey Fuller (ADF) Test & Phillip-Peron (PP) Test.

Co-integration

We have used Pedroni Co-Integration Test to examine whether there exists any long-term relationship among the time-series. The test examines the residuals of a spurious regression between I(1) time-series of multiple variables and confirms co-integration between two series if the residuals turn out to be stationary, i.e., I(0). If Y and X are two integrated time-series, which are first-differenced stationary, then the test uses the following equation to test the co-integration between Y & X series.

\[
Y_{i,t} = \alpha_i + \beta_1 X_{1i,t} + \beta_2 X_{2i,t} + \ldots + \beta_M X_{Mi,t} + \epsilon_{i,t}.
\]

for: \( t = 1, \ldots, T; i = 1, \ldots, N; m = 1, \ldots, M; \) where, \( \alpha_i \) & \( \epsilon_{i,t} \) are individual & time trends.

Panel VAR

We perform Vector Autoregressive (VAR) Model to understand the impact of each of the variables on each other over time. (Brandt and Williams (2007)) across all the four nations. All the variables are treated as both dependent and independent variables in the model. The time lags play an important role and makes the model highly dynamic in nature, as the variables depend on their own past values and also on current & past values of other variables. The interdependencies are explained using a set of VAR equations so that the relationship between the variables are unbiased.

The present study has adopted a panel VAR system of order 2 and it consists of five variables, including LGDP, DCPS, STTR, DEPTH & TRADE. The study has estimated the following VAR system, through panel mode, where four nations, namely, Mexico, Indonesia, Nigeria & Turkey, form the panel.
Results & discussions

The study adopts panel data for the VAR analysis. The periods from 1994 to 2015 are taken as Time series data & all the four countries stand as cross section data. We have considered four proxy variables including STTR, DCPS, DEPTH & TRADE to capture the financial development & LGDP as indicator of economic growth of the nations. The descriptive statistics of the panel data are exhibited in Table 2.

<table>
<thead>
<tr>
<th>Country</th>
<th>Statistic</th>
<th>LGDP</th>
<th>DCPS</th>
<th>STTR</th>
<th>DEPTH</th>
<th>TRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>Mean</td>
<td>3.8514</td>
<td>19.1665</td>
<td>8.5306</td>
<td>36.4034</td>
<td>53.7491</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>1.2931</td>
<td>5.62913</td>
<td>2.67032</td>
<td>9.48931</td>
<td>10.67191</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>3.56</td>
<td>12.12</td>
<td>3.24</td>
<td>22.71</td>
<td>25.97</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>4.01</td>
<td>34.58</td>
<td>12.97</td>
<td>53.20</td>
<td>72.80</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Mean</td>
<td>3.1270</td>
<td>34.4711</td>
<td>11.1278</td>
<td>44.7987</td>
<td>55.9189</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>0.28151</td>
<td>13.59062</td>
<td>4.01946</td>
<td>6.86677</td>
<td>10.84427</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>2.67</td>
<td>18.16</td>
<td>5.44</td>
<td>36.00</td>
<td>41.94</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>3.57</td>
<td>60.82</td>
<td>21.96</td>
<td>59.86</td>
<td>96.19</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Mean</td>
<td>2.8158</td>
<td>14.8920</td>
<td>2.0604</td>
<td>23.1821</td>
<td>56.7037</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>0.421308</td>
<td>6.94521</td>
<td>3.50594</td>
<td>7.02279</td>
<td>13.81557</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>2.67</td>
<td>8.69</td>
<td>0.00</td>
<td>13.23</td>
<td>30.00</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>3.57</td>
<td>38.35</td>
<td>14.53</td>
<td>43.27</td>
<td>81.19</td>
</tr>
<tr>
<td>Turkey</td>
<td>Mean</td>
<td>3.7189</td>
<td>29.8717</td>
<td>33.1165</td>
<td>41.5132</td>
<td>47.0182</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>0.24039</td>
<td>18.92004</td>
<td>16.33154</td>
<td>11.89910</td>
<td>8.67744</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>3.36</td>
<td>14.52</td>
<td>5.27</td>
<td>23.74</td>
<td>30.48</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>4.03</td>
<td>78.51</td>
<td>62.26</td>
<td>63.11</td>
<td>60.01</td>
</tr>
</tbody>
</table>

In order to know whether we have chosen the right variables to study the relationship, we estimate the bivariate correlation coefficient between the variables. We observe that growth is positively related to all the financial indicators and is negatively related to TRADE; and most of the other variables are also positively related with each other. Results of Table 3 strengthens our variable selection for the study.

<table>
<thead>
<tr>
<th></th>
<th>LGDP</th>
<th>DCPS</th>
<th>DEPTH</th>
<th>STTR</th>
<th>TRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCPS</td>
<td>0.186171</td>
<td>1</td>
<td>0.70491</td>
<td>0.4742</td>
<td>0.111759</td>
</tr>
<tr>
<td>DEPTH</td>
<td>0.381308</td>
<td>0.70491</td>
<td>1</td>
<td>0.541905</td>
<td>0.288314</td>
</tr>
<tr>
<td>LGDP</td>
<td>1</td>
<td>0.186171</td>
<td>0.381308</td>
<td>0.508821</td>
<td>-0.31844</td>
</tr>
<tr>
<td>STTR</td>
<td>0.508821</td>
<td>0.4742</td>
<td>0.541905</td>
<td>1</td>
<td>-0.08479</td>
</tr>
<tr>
<td>TRADE</td>
<td>-0.31844</td>
<td>0.111759</td>
<td>0.288314</td>
<td>-0.08479</td>
<td>1</td>
</tr>
</tbody>
</table>
Further, Figure 1 illustrates time series trend of all five variables across the panels.

**Figure 1 Illustration of Time Series Trends: 1990 – 2015**

![Graphs of Time Series Trends: 1990 – 2015](image)

Figure 1 indicates clearly a non-stationarity in time series for all the variables across all the nations. However, in order to conclude non-stationarity, the study has conducted panel unit-root test for all the individual variables. The results of the panel unit-root test are presented in Table 4.

**Table 4 Panel Unit Root Test**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Statistics</th>
<th>NIT</th>
<th>IT</th>
<th>I</th>
<th>NIT</th>
<th>IT</th>
<th>I</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At level</td>
<td></td>
<td></td>
<td>At First Difference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGDP</td>
<td>LLC</td>
<td>2.605</td>
<td>-0.6205</td>
<td>0.1027</td>
<td>-6.600**</td>
<td>- 3.9593**</td>
<td>-4.8021**</td>
<td>1(1)</td>
</tr>
<tr>
<td>BT</td>
<td>-1.2215</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPS</td>
<td>-1.0701</td>
<td>1.5913</td>
<td></td>
<td>-3.4960**</td>
<td></td>
<td>- 4.737**</td>
<td></td>
<td>1(1)</td>
</tr>
<tr>
<td>ADF</td>
<td>0.362</td>
<td>12.333</td>
<td>2.7967</td>
<td>49.4296**</td>
<td>26.1996**</td>
<td>36.845**</td>
<td></td>
<td>1(1)</td>
</tr>
<tr>
<td>PP</td>
<td>0.215</td>
<td>10.683</td>
<td>4.0817</td>
<td>78.8696**</td>
<td>67.3349**</td>
<td>67.688**</td>
<td></td>
<td>1(1)</td>
</tr>
</tbody>
</table>
The results indicate that we have enough statistical evidence to say all the five time-series including DCPS, STTR, TRADE, DEPTH and LGDP are non-stationary during the period under study and have unit roots. However, the first differences of these variables ensure stationarity, indicated by I(1) processes for the variables under study.

<table>
<thead>
<tr>
<th>LLC</th>
<th>BT</th>
<th>IPS</th>
<th>ADF</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCPS</td>
<td>1.361</td>
<td>2.3573</td>
<td>3.0002</td>
<td>-5.052**</td>
</tr>
<tr>
<td>STTR</td>
<td>-1.119</td>
<td>1.4413</td>
<td>2.2011</td>
<td>-9.4374**</td>
</tr>
<tr>
<td>DEPTH</td>
<td>1.156</td>
<td>1.3454</td>
<td>0.3033</td>
<td>-5.513**</td>
</tr>
<tr>
<td>TRADE</td>
<td>0.8243</td>
<td>2.5988</td>
<td>0.8218</td>
<td>-8.4352**</td>
</tr>
</tbody>
</table>

Note: LLC: Levin, Lin & Chu; BT: Breitung t-stat; IPS: Im, Pesaran and Shin W-stat; ADF: ADF - Fisher Chi-square; PP: PP - Fisher Chi-square; NIT: No trend and intercept; I: Individual intercept; IT: Both trend and intercept; **: level of significance at 1%; *: level of significance at 5%
As all the series turn out to be I(1) processes, it is necessary to check whether there exists any long term relationship between the series. We perform a Panel Co-Integration test using Pedroni Residual Co-integration test for multivariate panel data. The test examines the null hypothesis that there is no long-term relationship between the time series. Table 5 produces the results of co-integration test. We perform the test on three different models: model with no deterministic trend, model with deterministic trend and intercept and model with no deterministic intercept or trend. All the models examine eleven types of test. All the results of these tests statistic, presented in Table 5, ensure that the null hypothesis cannot be rejected as the probability, associated with each & every test, are greater than 0.05. We conclude that the time series under study are not co-integrated, indicating that there exists no long-term relationship between the variables. The above result, thus, endorses that there is no need to conduct an error correction model as no long-term relationship has been diagnosed either within group or between the groups of time series. We therefore move ahead to perform a VAR analysis to examine the relationship between the variables.
Before performing VAR, we ensure that the correct lag period is chosen as selection of right lag period has a significant impact on the result. We adopt five lag selection methods including Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ) method incorporating a maximum of eight lags and the result of these tests are produced in Table 6. Three out of five tests suggest that lag 2 should be the ideal period while other two tests recommend a lesser lag value. The present study relies much on AIC criterion, as lags are selected on that value which minimizes the Akaike Information Criterion (AIC). Therefore, the study finds that a lag value of 2 is appropriate. Further, we also perform the residual autocorrelation test to ensure that there is no autocorrelation between the variables. Based on the results, we confirm that our selection of a lag value of 2 is correct. The result of estimated panel VAR model is presented in Table 7 below. As determined by the lag optimization model, the study uses two lags to determine the interdependencies between finance, trade and growth for the composite unit.

### Table 6 Lag Selection

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-770.262</td>
<td>NA</td>
<td>5499.695</td>
<td>22.80182</td>
<td>22.96502*</td>
<td>22.86649</td>
</tr>
<tr>
<td>1</td>
<td>-725.543</td>
<td>81.54606</td>
<td>3086.438</td>
<td>22.22186</td>
<td>23.20105</td>
<td>22.60984*</td>
</tr>
<tr>
<td>2</td>
<td>-693.178</td>
<td>54.25987*</td>
<td>2515.369*</td>
<td>22.00522*</td>
<td>23.80041</td>
<td>22.71653</td>
</tr>
<tr>
<td>3</td>
<td>-677.575</td>
<td>3419.187</td>
<td>22.28162</td>
<td>22.71653</td>
<td>23.31625</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-654.838</td>
<td>3877.667</td>
<td>22.34817</td>
<td>23.70612</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-627.558</td>
<td>4811.498</td>
<td>22.28112</td>
<td>23.9624</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-603.403</td>
<td>5899.218</td>
<td>22.04474</td>
<td>24.60072</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-577.275</td>
<td>6657.494</td>
<td>22.04474</td>
<td>24.69598</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final Prediction Error; AIC: Akaike Information Criterion; SC: Schwarz Information Criterion; HQ: Hannan-Quinn Information Criterion

### Table 7 Estimated Coefficients of Panel VAR model

<table>
<thead>
<tr>
<th></th>
<th>DLGDP</th>
<th>DDCPS</th>
<th>DSTTR</th>
<th>DTRADE</th>
<th>DDEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAG 1</td>
<td>-0.05</td>
<td>-0.08</td>
<td>-0.002</td>
<td>-0.00</td>
<td>-0.00</td>
</tr>
<tr>
<td>LAG 2</td>
<td></td>
<td></td>
<td>0.001</td>
<td>-0.003</td>
<td>-0.00</td>
</tr>
<tr>
<td>DV</td>
<td>-0.81</td>
<td>1.55</td>
<td>-0.17</td>
<td>0.21</td>
<td>-0.39</td>
</tr>
<tr>
<td>DDCPS</td>
<td>37.46*</td>
<td>-8.11</td>
<td>0.25</td>
<td>0.10</td>
<td>-0.33*</td>
</tr>
<tr>
<td>DSTTR</td>
<td></td>
<td></td>
<td>0.06</td>
<td>0.001</td>
<td>-0.04</td>
</tr>
<tr>
<td>DTRADE</td>
<td>33.99*</td>
<td>-24.38</td>
<td>0.10</td>
<td>0.18</td>
<td>-0.24</td>
</tr>
<tr>
<td>DDEPTH</td>
<td>15.76</td>
<td>6.51</td>
<td>0.04</td>
<td>0.05</td>
<td>0.20*</td>
</tr>
<tr>
<td>C</td>
<td>0.034*</td>
<td>-0.40</td>
<td>0.75</td>
<td>-0.21</td>
<td>-0.09</td>
</tr>
</tbody>
</table>

* represents significant values from the T-statistics of the VAR model

It is evident from the coefficient table that the previous year's GDP (i.e., DLGD$i_{t-1}$) has a positive significant effect on domestic credit (DDC$i_{t-1}$) and trade (DTRA$i_{t-1}$). Further, while examining the interactions among financial parameters, we observe that even though Stock Traded Turnover Ratio encourages Broad Money (DEPTH) in a significant way, it receives a negative impact from its own past values, as indicated by the significant negative coefficient pertaining to the second lag values. The rest of the interactions in the VAR model are not statistically significant.
From the above discussions on panel VAR analysis, we find that our first hypothesis is significant as GDP has a positive impact on Domestic Credit to Private Sector (DCPS). The result further shows that GDP also drives TRADE of these nations indicating the significance of the third hypothesis. The results summarize very clearly that financial development of this composite MINT group are to a large extent driven by economic growth of the nations; even though the development of financial sector is also triggered by the stock market. Table 8 abridges the results of all the eight hypotheses formulated for the study. We conclude from Table 8 that economic growth influences the financial development and it is not the other way round.

The stability of the VAR system is then examined through AR root test. The results of the test, produced in Table 10, check stationarity of all the variables used in the system and confirms the stability of the model, as modulus of all roots are found less than one value.

### Table 8 Results of Hypotheses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: LGDP → DCPS</td>
<td>Supported</td>
</tr>
<tr>
<td>H2: LGDP → STTR</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H3: LGDP → TRADE</td>
<td>Supported</td>
</tr>
<tr>
<td>H4: LGDP → DEPTH</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H5: DCPS → LGDP</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H6: STTR → LGDP</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H7: TRADE → LGDP</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H8: DEPTH → LGDP</td>
<td>Not Supported</td>
</tr>
</tbody>
</table>

The study further examines the VAR residual serial correlation of the time series. We perform LM test for both lag 1 & lag 2. The test scans the null hypothesis that there exists no serial correlation between the series. Table 9 below produces the test results, which confirm that there is no autocorrelation present in the series, as the null hypothesis cannot be rejected for high p values (p> 0.05) for both lags.

### Table 9 VAR Residual Serial Correlation LM Tests

<table>
<thead>
<tr>
<th>Lags</th>
<th>LM - Stat</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29.6945</td>
<td>0.2359</td>
</tr>
<tr>
<td>2</td>
<td>18.7306</td>
<td>0.8099</td>
</tr>
</tbody>
</table>

### Table 10 Results of AR Root Test

<table>
<thead>
<tr>
<th>Root</th>
<th>Modulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.309135 - 0.523843i</td>
<td>0.608257</td>
</tr>
<tr>
<td>-0.309135 + 0.523843i</td>
<td>0.608257</td>
</tr>
<tr>
<td>-0.410907 - 0.333577i</td>
<td>0.529262</td>
</tr>
<tr>
<td>-0.410907 + 0.333577i</td>
<td>0.529262</td>
</tr>
<tr>
<td>0.018150 - 0.515615i</td>
<td>0.515934</td>
</tr>
<tr>
<td>0.018150 + 0.515615i</td>
<td>0.515934</td>
</tr>
<tr>
<td>0.124233 - 0.367242i</td>
<td>0.387686</td>
</tr>
<tr>
<td>0.124233 + 0.367242i</td>
<td>0.387686</td>
</tr>
<tr>
<td>0.333906 - 0.151536i</td>
<td>0.366683</td>
</tr>
<tr>
<td>0.333906 + 0.151536i</td>
<td>0.366683</td>
</tr>
</tbody>
</table>

Figure 2 visualizes the stationary of the system, as modulus of all the roots lie inside the unit circle.
In order to capture the dynamic impact of one variables on the other, the study has estimated the impulse response functions for the estimated VAR. An Impulse Response Function (IRF) explains the impact of 'impulse' variable on 'response' variable over a period of 10 years from the shock. The study investigates the residual one standard deviation IRF, which sets the impulses to one standard deviation of the residual. After examining all the individual impulse functions, we highlight the following impacts as part of our study.

We observe in Figure 3 that one unit (a one standard deviation) changes in DEPTH causes a 1% increase in GDP immediately. However it leads to a sharp decline in economic growth for next couple of years; the bottom reaches after two years, then slowly the growth starts picking up and gradually the impact dies out in a span of 6 to 7 years. Therefore, a shock in broad money affects the economic growth for a short period and does not leave a long-term impression. The effect of having a shock on other financial variables on GDP turns out to be insignificant.

After examining short run dynamic impact of financial parameters on economic growth, we examine the similar behavior of GDP on financial development of the composite nation. We observe that among all the four financial indicators, DCPS & TRADE have responded significantly in the short run to the shock of GDP.
Further, we are curious to observe such dynamic interactions among financial indicators and find that DEPTH has a significant short-term effect on STTR, which is captured in Figure 6 below.

The results of Impulse Response Function reveal that economic growth has an immediate remarkable impact on financial parameters including domestic credit to private sector & trade; and a change in Broad Money influences the growth along with stock trading ratio significantly.

At this juncture, we examine whether time-series of a particular variable appears before that of the other variable using Granger Causality Test to supplement the understanding of dynamic causality. Table 10 highlights the significant pair-wise occurrences of the variables under study.

Figure 5 Response of DTRADE to DLGDP

Figure 6 Response of DSTTR to DDEPTH
Table 10 Results of Granger Causality Test

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Observation</th>
<th>F-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLGDP does not Granger Cause DDCPS</td>
<td>92</td>
<td>11.189</td>
<td>0.0001</td>
</tr>
<tr>
<td>DLGDP does not Granger Cause DTRADE</td>
<td>92</td>
<td>3.0311</td>
<td>0.0534</td>
</tr>
<tr>
<td>DTRADE does not Granger Cause DDCPS</td>
<td>92</td>
<td>4.70078</td>
<td>0.0115</td>
</tr>
<tr>
<td>DSTTR does not Granger Cause DDEPTH</td>
<td>92</td>
<td>4.84927</td>
<td>0.0101</td>
</tr>
<tr>
<td>DDEPTH does not Granger Cause DSTTR</td>
<td>92</td>
<td>4.22235</td>
<td>0.0178</td>
</tr>
</tbody>
</table>

We observe that GDP granger causes both domestic credit to private sector and Trade; Trade granger causes DCPS; STTR and DEPTH both granger cause each other.

We now summarize our findings that economic growth in MINT nations definitely boosts the banking development and trade, both in long run as well as in short run, as it is evident from VAR and Impulse Response analysis; also Granger's causality test shows that growth is observed before baking development & broad money, the two key parameters of financial development. It is evident that growth has created demand for capital through enhancement of production and an efficient banking sector has responded positively to it.

Conclusions

In the current research, we focus our analyses to test whether financial development leads to economic growth or growth has a positive impact on financial development for the MINT nations. We find that the emerging MINT economy follows the demand-pull hypothesis, as economic growth drives the production and that in turn calls for capital market development. The results thus obtained will be useful insight for academicians, researchers and policy makers who are interested in studying the emerging economy. In specific, these results might throw insights to the decision-making authorities of the government of Mexico, Indonesia, Nigeria, and Turkey. Monetary and fiscal policy decisions in the MINT countries could be revised accordingly by understanding the dynamic interactions of growth, financial deepening, trade, stock market and bank developments.

To keep the model simple, we have used very few variables. The study of the emerging markets in a dynamic environment could further be extended by considering an exhaustive list of economic growth indicators and financial development indicators with a platform that could accommodate a much broader picture. Also replication of the work with a different set of variables, different study units and methods are highly recommended. As political stability, geographical factors and cultural changes have significant impacts on the MINT nations, future studies could be based on these variables as well.

References


Fraser, I. “Fidelity is confident its MINTs won't suck.” *Information QFINANCE*, 2011. Bloomsbury


Wright, Chris “After the BRICS Are the MINTs, But Can You Make Any Money from Them?” *forbes.com*. 2014.


************
The present study is a modest attempt to investigate whether competition can improve financial stability in the Indian commercial banking sector during a period of increasing trend in the degree of competition over the years. It is based on secondary data pertaining to 40 listed Indian commercial banks over a period of 19 years collected from 'Capitaline Plus' corporate database, annual reports of the respective banks and various reports on trends and progress on banking in India published by the RBI. Employing alternative measures of bank competition and risk, the results indicate that competition stability view is valid in the context of Indian commercial banking sector as a whole. Further, the study also indicates that bank employees play a vital role in reducing the risk of Indian banks.

Key Words: Bank Risk, Bank Competition, Competition Stability or Fragility, Human capital Efficiency; Indian Commercial Banks.
Competitive market structure of banking sector is a crucial issue because of its impact on their financial stability and on overall industrial and economic growth (Allen and Gale, 2004). Several rounds of reforms in Indian banking sector since 1991 have been undertaken with the aim of creating more competitive environment and enhancing financial stability. Empirical literature indicates that the degree of competition in Indian banking sector has increased during the last two decades (Arrawatia and Misra, 2012; Maji and Hazarika, 2016a; 2018). Likewise, the degree of concentration based on total assets of large five Indian banks (45.32%) is considerably less as in comparison to other emerging markets like Brazil (80.47%), Russian Federation (53.26%), China (52.52%), Pakistan (63.22%) and Malaysia (73.56%) at the end of 2015 based on Bankscope data. Increase in the competition of Indian banking sector raises a research question: does bank competition lead to greater financial stability?. The question is pertinent because the extant literature provides two extreme views relating to the influence of competition on bank stability or risk. Further, the empirical literature relating to this issue after controlling the influence of relevant bank specific factors and macro-economic factors is scanty in the context of Indian banking sector.

The traditional competition fragility view (franchise-value framework) states that excessive competition in the market reduces the market power of banks as well as the profits, which ultimately reduce their franchise value. Since the franchise value belongs to the shareholders, banks are forced to take more risk to increase return (Marcus, 1984; Keeley, 1990; Demsetz et al., 1996). This may result in increasing the probability of higher non-performing loan ratio and risk of insolvency (Matutes and Vives, 2000; Hellmann et al., 2000). There is, thus, an inverse relationship between competition and stability or the association between competition and bank risk is positive. As an alternative, Boyd and Nicolo (2005) have proposed a very interesting and challenging view known as competition stability view (BDN model or the risk-shifting paradigm). According to this view, less competition among banks could result in higher interest rate charges on bank loans, which may increase the credit risk of banks. In contrast, greater competition in the banking industry reduces the rate of interest on loans & advances and thus reduces the risk of loan default and enhances banks’ stability. This view, therefore, states that competition and bank risk are inversely associated.

Like contradictory theoretical views, empirical evidences relating to the association between competition and risk also offer mixed results. While some researchers have found positive association between competition and risk, supporting competition fragility view (Ruiz-Porras, 2008; Lopez et al., 2010; Beck et al., 2013; Leroy and Lucotte, 2015), some studies find negative association supporting competition stability view (Yeyati and Micco, 2007; Boyd et al., 2009; Agoraki et al., 2011; Kick and Prieto, 2012; Sarkar and Sensarma, 2015). Thus, neither the theory nor the empirical studies provide sufficient conclusive evidence regarding the influence of market competition on bank risk. Existing literature also shows that most of the empirical studies are associated with developed countries like USA, UK and other European countries. In Indian context, empirical literature on the impact of competition on bank risk is scanty except the study of Sarkar and Sensarma (2015) in recent times.

Against this backdrop, the present study is modest attempt to enrich the empirical literature by providing evidence on the association between competition and risk in Indian commercial banking sector during a period of increase in the degree of competition over the years. Further, the study has also provides evidence of the role of bank employees in the matter of managing bank risk. The rest of this paper is organized as follows: Section 2 presents the review of relevant literature. The data and methodology adopted in the study are discussed in section 3. While, the empirical results and discussions are presented in the section 4, section 5 deals with conclusion and policy implication of the study.

**Review of Literature**

Plentora of empirical evidences suggested that the competition fragility view prevails in many countries. Ruiz-Porras (2008) examined the impact of competition on financial stability of banking system in 47 countries. The results suggest that there is a trade-off between bank competition and financial fragility, which indicate that competition increases the risks of banks. Similarly, Berger et al. (2009) have investigated the association between bank competition and risk on 8235 banks from 23 developed countries using alternative definitions of bank stability (insolvency risk and loan risk) and degree of competition (Lerner index and Herfindahl– Hirschman Index). The overall results are found to be consistent with the traditional competition-fragility view. In another study by Lopez et al. (2010) suggests negative relationship between market power and risk-taking in Spanish Banking Sector. The study
concludes that increase in firm default risk could lead to higher non-performing loan ratios and greater bank instability. Similarly, Beck et al. (2013) on select US banks and Titko et al. (2015) in the context of Latvian banks have observed empirical evidence in support of competition-fragility view.

In emerging markets also, the researchers observe empirical evidence in support of competition fragility view. Soedarmonoa et al. (2013) for banks in 11 emerging countries of Asia indicate that at the time of crisis, low competition leads to financial stability, which is reverse in case of normal times. Likewise, Dwumfour (2017) on banks in Sub-saharan Africa suggest that competition increases risk taking which affects the financial stability of banks leading to bank failure. Similar results are found in case of Kabir and Worthinton (2017) in both Islamic and conventional banks from 16 developing countries and Kouki and Al-Nasser (2017) on banks in Africa.

However, some empirical evidences support the competition stability view. The findings of Boyd et al. (2009) on banks from US and other 134 non-industrialized countries found a negative relationship between the competition and bank risk. Similar results are found in case of Uhde and Heimeshoff (2009) on banks from 25 EU countries and Yalıdz and Bazzana (2010) for Turkey. In another study, Agoraki et al. (2011) have investigated the association between competition, risk and regulation of banks in Central European countries. The results indicate that market power has a negative impact on bank risk and banks' face lower probability of default. Similar results are found in case of Kick and Prieto (2012) on German banks, Liu et al. (2012) on four South-East Asian countries, Schaeck and Cihak (2014) for European banks, Kasman and Carvallo (2014) on commercial banks from 15 Latin American countries and Vardar (2015) in Turkish banking sector. However, a study conducted by Davis and Karim (2008) on the association between banking competition and risk-taking of 27 EU countries observed positive impact of competition on bank risk in the short run and inverse association in the long run.

Apart from the positive and negative association between and competition and risk, some researchers indicate non-linear association between the two. For instance, Boyd and De Nicolo (2005) and Martinez-Miera and Repullo (2008) have found 'U-shaped' relationship between competition and stability. The results show that higher bank competition initially increases bank risk and then declines. Likewise, the findings of Tabak et al. (2012) in case of 10 Latin American countries, Samantas (2013) on banks in EU countries, Jeon and Lim (2013) on Korean commercial banks and Jemenez et al. (2013) on Spanish banking market found a non-linear relationship between competition and stability.

In Indian context, there are some studies that examined the degree of market competition on Indian banking sector. However, the impact of bank competition on risk taking behaviour is very limited. Recently, Sarkar and Sensarma (2015) have conducted a study to investigate the nexus between competition and stability of scheduled commercial banks in India during 2000-2013. The study observes some contradictory results. The findings indicate that concentration has positive effect on default risk, asset risk and market risk which supports the competition-stability view. On the other hand, concentration has a positive relationship with capital and liquidity ratios, indicating that an increase in the level of competition affects the banks safety buffers negatively.

**Data and Methodology**

**Data sources and sample**

Present study is based on secondary data on listed Indian commercial banks collected from 'Capitaline Plus' corporate data database and annual reports of the respective banks for a period of 19 years from 1999-2000 to 2017-18. The study period is sufficiently large to draw meaningful conclusion. Relevant economy related data are collected from the various economic survey reports of the Government of India. In this study we have considered all listed Indian commercial banks during the study period except Standard Chartered Bank as it is the only foreign bank listed in India. The final sample, thus, consists of 40 commercial banks out of which 24 are public sector banks and 16 are Indian private sector banks. These banks hold approximately 90% of the total assets of Scheduled commercial banks (SCBs) operating in India.

**Definition of variables**

**Dependent variable**

**Bank Risk**

Based on the existing literature, present study has employed three measure of bank risk namely, gross non-performing assets (GNPA) ratio, net non-performing assets (NNPA) ratio and Z-score (Berger and DeYoung, 1997; Chaibi, and Fitti, 2015; Laeven and Levine, 2009; Ghosh, 2014). While first two measures are concerned with credit risk of banks, the third one is the indicator of insolvency risk. GNPA is defined as the ratio between gross NPAs and gross advances. NNPA is defined as the ratio of net NPAs to net advances. On
the other hand, to capture the overall risk of Indian commercial banks, the present study has applied the risk index suggested by Hannan and Hanwack (1988), known as the Z-score. The following formula is used to measure the Z-score:

$$Z - score = \ln \left( \frac{ROA + CAP}{\sigma_{ROA}} \right) \ldots (i)$$

Where ROA is the return on assets; CAP is the capital to asset ratio and $\sigma_{ROA}$ is the rolling standard deviation of ROA of three years $t$, $t-1$ and $t-2$. Since the observed Z-score is found to be positively skewed, natural logarithm of Z score is used to obtain symmetric distribution (Laeven and Levine, 2009; Ghosh, 2014). This measure of bank risk is widely used in the present times as it takes into consideration the influence of various risks like operational risk, market risk, credit risk etc. faced by banking sector.

Independent Variables

Bank competition (COMPT): The study uses both structural and non-structural measures of bank competition. Among the structural measures, we employ Herfindahl–Hirschman Index (HHI) and concentration ratio (CR), which are widely used in the empirical literature (Uddin and Suzuki, 2014; Iskenderoglu and Tomak, 2013). We compute HHI based on deposit, known as Herfindahl–Hirschman Deposits Index (HHID), by employing the following formula:

$$HHI_D = \sum_{i=1}^{n} S_i^2 \ldots (ii)$$

For computing concentration ratio, we use four bank concentration ratio based on loans & advances (CR4L&A) by employing the following formula:

$$CR4_{L&A} = \sum_{i=1}^{4} S_i \ldots (iii)$$

Where $S_i$ is the market share of $i$th largest banks in terms of loans and advances. Concentration ratio ranges from 0 to 1, with higher value indicates lower competition or greater concentration. CR4 is widely used in the extant literature for measuring bank concentration (Liu et al., 2010; Uddin and Suzuki, 2014, Maji and Hazarika, 2018).

Among the non-structural measures of competition, we use H – statistic suggested by Panzar and Rosse (1987) and is extensively used in empirical literature (Claessens and Laeven, 2004; Maji and Hazarika, 2016b). H-statistic is derived from the reduced form of revenue equation and indicates the sum of the coefficients of input price factors with respect to the bank’s revenue. We compute H-statistics employing the following model for each year:

$$\ln(R_i) = \alpha_i + \beta_1 \ln(W_{i1}) + \beta_2 \ln(W_{i2}) + \beta_3 \ln(W_{i3}) + \gamma_1 \ln(CF_{i1}) + \gamma_2 \ln(CF_{i2}) + \gamma_3 \ln(CF_{i3}) + \gamma_4 \ln(CF_{i4}) + \epsilon_i \ldots (iv)$$

Where,

$R_i$= Total revenue/ total assets (proxy for output price of loans and other services and includes total interest revenue, fee income, commission income, and other operating income)

$W_1$= Interest expenses/total deposits and money market funding (proxy for input price of deposits)

$W_2$= Personnel expenses to total assets (proxy for input price of labour or human resource)

$W_3$= Other operating and administrative expense to total assets (proxy for input price of equipment and fixed assets)

$CF1$= Ratio of deposits to deposits and money market funding

$CF2$= Net loans to total assets,

$CF3$= Equity to total assets, and

$CF4$= Bank size, measured as total balance sheet assets.

The H-statistic is sum of input elasticities, i.e.

The interpretation of H-statistic is:

$H \leq 0$ indicates monopoly equilibrium

$0 < H < 1$ indicates monopolistic competition

$H = 1$ indicates perfect competition

Bank profitability (ROA): For measuring bank profitability, most common used proxy in the literature is the Return on assets (ROA) (Rime, 2001; Maji and De, 2015). The study employed the ratio of operating profit to total assets to measure ROA. The influence of profitability on bank risk is a debatable issue in the banking literature embracing both positive and negative association (Noman et al. 2015; Maji and Hazarika, 2016a).

Size (SIZE): The natural logarithm of total assets is used to measure the bank size. Empirical literature indicates that size is an important factor that influences bank’s risk levels (Rime, 2001; Ghosh, 2014). Large banks are expected to have lower risk due to risk diversification, economies of scale and better opportunities of managing credit activities through skilled employees.

Loan loss provision (LLP): The existing literature suggests mixed result on the association between LLP and bank risk.
(Rime, 2001; Awdeh, EL-Moussawi and Machrouh, 2011). The present study uses the definition for LLP as the ratio of loan loss reserve to gross loans.

Human capital efficiency (HCE): In this study, we have added the HCE as an explanatory variable due to the importance of human resources (bank employees) in managing bank risk. Plethora of empirical evidences shed light on the important role of human resources in enhancing the financial performance of banks (Mavridis and Kyrmizoglou, 2005; Malik, Aslam and Latif, 2012; Ghosh and Maji, 2014). Further, the findings of Maji and De (2015) also indicate that bank employees play significant role in managing credit risk.

Although it is very difficult to measure the efficiency of human resources, the present study relies on the value added intellectual coefficient (VAIC) model suggested by Pulic (2000) as a proxy to measure human capital efficiency (HCE). The VAIC model is widely used in the banking literature on intellectual capital measurement (Mavridis and Kyrmizoglou, 2005; Clarke et al., 2011; Joshi et al., 2013; Ghosh and Maji, 2015). Following the VAIC model, HCE is defined as:

HCE = VA/HC …. (vi),

Where, VA is the difference between output (total revenue generated by a firm during a year) and input (summation of all costs incurred by a firm in generating revenue except employee costs which are treated as value creating entity). Algebraically VA can be expresses as:

VA = NI + T + I + D + A + EC …. (vii),

Where, NI is net income after tax; T is corporate tax; I is interest expense; D is depreciation; A is amortization and EC is the employee costs. Human capital (HC) is defined as the overall employee cost during a period. HCE reflects the efficiency of the human capital (HC) in generating added value.

Equity to total asset ratio (ETA): Bank capital acts as a cushion, which absorbs the uncertain losses. Literature states mixed argument regarding the relationship between ratio of equity to total assets and bank risk. The present study employs the equity to total asset ratio to see its impact on the level of risk of Indian commercial banks.

Asset composition (AC): The asset composition of banks reveals the quantity of physical assets that it holds. There are two ways for measuring the asset composition - ratio of loans to total assets and ratio of fixed assets to total assets (Iskenderoglu and Tomak, 2013; Samantas, 2013). To measure the asset composition, loans to total asset ratio is used in this study.

SIZE of intermediation (IS): Deposit and loans are the main component to run the activities of a bank. Intermediation size (IS) is the size of deposit which is converted into loan and advances. It is a useful element which determines the level of bank risk. Higher ratio indicates higher bank risk due to the reason of probability of non-repayment by few borrowers (Rasiah, 2010). However, very low size indicates low earnings by the bank which is due to the underutilization of resources. The empirical literature also shows mixed results. Intermediation size is defined as loan to deposit ratio in the present study.

Macroeconomic variable: To capture the country-specific macroeconomic shocks, the present study considers growth in gross domestic factor (GGDP). Many researchers advocate that growth in GDP has a direct impact on the risk of banks (Ahmed and Ariff, 2007; Ramanadh and Rajesham, 2013). The data for GGDP during 2000-2018 are collected from the RBI database and Economic Survey Reports.

Dummy variable (Dsize): Apart from bank size as a continuous variable, the capacity and behavior of large and small banks in risk taking is expected to be different. Hence, we use a dummy variable (0 or 1) to examine the whether the large and small banks have a significant difference in the level of risk, where the value takes 1 for large banks and 0 for small banks. Mean value is used to define bank size in two categories.

Variables used in this study and their definitions are summarized in table 1.
Table 1: Definition of the variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition/Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
</tr>
<tr>
<td>Bank risk (RISK)</td>
<td>Three measures of bank risk</td>
</tr>
<tr>
<td></td>
<td>1. GNPA (=) ((\text{Gross NPAs} \div \text{Gross Loans}) \times 100)</td>
</tr>
<tr>
<td></td>
<td>2. NNPA (=) ((\text{Net NPAs} \div \text{Net Loans}) \times 100)</td>
</tr>
<tr>
<td></td>
<td>3. Z Stat. (=) (\frac{\text{ROA} \times \text{CAP}}{\sigma(\text{ROA})})</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Bank competition (COMPT)</td>
<td>Three measures of bank competition</td>
</tr>
<tr>
<td></td>
<td>1. H-statistics (=) (\sum_{i=1}^{n} \beta_i )</td>
</tr>
<tr>
<td></td>
<td>2. HHI (=) (\sum_{i=1}^{n} S_i^2 )</td>
</tr>
<tr>
<td></td>
<td>3. CR (=) (\sum_{i=1}^{K} S_i )</td>
</tr>
<tr>
<td>Profitability (ROA)</td>
<td>Operating profit/total assets</td>
</tr>
<tr>
<td>SIZE</td>
<td>Natural log of total assets</td>
</tr>
<tr>
<td>Loan loss provisions (LLP)</td>
<td>Loan loss reserve/ gross loans</td>
</tr>
<tr>
<td>Human capital efficiency (HCE)</td>
<td>Value added/Human capital</td>
</tr>
<tr>
<td>Equity to total asset ratio ( ETA)</td>
<td></td>
</tr>
<tr>
<td>Asset composition (AC)</td>
<td>Loans/ Assets Ratio</td>
</tr>
<tr>
<td>SIZE of intermediation (IS)</td>
<td>Loans /Deposits Ratio</td>
</tr>
<tr>
<td>Growth in GDP (GGDP)</td>
<td>Data collected from the RBI database and Economic Survey reports.</td>
</tr>
<tr>
<td>Dummy variable</td>
<td>D is used based on bank size</td>
</tr>
<tr>
<td>D</td>
<td>where D = 1 is for large banks and 0 for small banks</td>
</tr>
</tbody>
</table>

Source: Compiled by the author

Empirical models

Initially we have used *Hausman test for endogeneity* to test the possible endogeneity between the bank risk and competition. Since there is no evidence of endogeneity based on the outcome of the test, appropriate panel data regression model is used in this study. For this, two widely used test - Breusch-Pagan test and Hausman test are conducted. The results of Breusch-Pagan test indicate that pooled regression is not appropriate for the present data set. Hence, we use Hausman test to find out whether fixed effects model or random effects model is appropriate and accordingly we have estimated the coefficients of the covariates. Following regression models are employed to examine the influence of competition on bank risk after controlling the influence of bank specific and macroeconomic variables.

\[
\begin{align*}
\text{GNPA}_{it} &= \beta_0 + \beta_1 \text{COMPT}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{LLP}_{it} + \beta_5 \text{HCE}_{it} \\
&\quad + \beta_6 \text{ET}_{it} + \beta_7 \text{AC}_{it} + \beta_8 \text{IS}_{it} + \beta_9 \text{SIZE2}_{it} + \beta_{10} \text{GGDP}_{it} + \varepsilon_{it} \quad (1) \\
\text{NNPA}_{it} &= \beta_0 + \beta_1 \text{COMPT}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{LLP}_{it} + \beta_5 \text{HCE}_{it} + \beta_6 \text{ETA}_{it} \\
&\quad + \beta_7 \text{AC}_{it} + \beta_8 \text{IS}_{it} + \beta_9 \text{SIZE2}_{it} + \beta_{10} \text{GGDP}_{it} + \varepsilon_{it} \quad (2) \\
Z \text{ score}_{it} &= \beta_0 + \beta_1 \text{COMPT}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{LLP}_{it} + \beta_5 \text{HCE}_{it} \\
&\quad + \beta_6 \text{ETA}_{it} + \beta_7 \text{AC}_{it} + \beta_8 \text{IS}_{it} + \beta_9 \text{SIZE2}_{it} + \beta_{10} \text{GGDP}_{it} + \varepsilon_{it} \quad (3)
\end{align*}
\]
While GNPA and NNPA are the two measures of bank credit risk, Z-score is the measure of insolvency risk. COMPT is the degree of competition calculated using three different measures, namely H-statistics, HHI, and CR4. Use of both structural and non-structural measures of competition would be helpful not only to provide a complete view about the impact of competition on bank risk but also useful for the robustness check of the results. Bank profitability (ROA), bank size (SIZE), loan loss provision (LLP), human capital efficiency (HCE), equity to total assets (ETA), asset composition (AC), size of the intermediation (IS) and Dummy variable based on size (Dsize) are the bank specific control variables and growth in gross domestic product (GGDP) is the macroeconomic variable used in this study.

4. Results and Discussion

Descriptive statistics

Descriptive statistics containing minimum, maximum, mean and skewness for all the variables used in this study are shown in table 2. Mean value of GNPA is 5.789, while it is 2.719 in case of NNPA. This indicates that the average credit risk of Indian commercial banks is very high. Indeed, based on the findings of Maji and Hazarika (2018), NPA ratio of Indian banks shows an increasing trend in recent times, which is very alarming for the financial health of Indian banks. Similar result is observed in case of insolvency risk measured by Z-statistic. Since, Z-statistic is the measure of safety index, the higher the value of Z-statistic the lower is the probability of insolvency. The distribution of Z-statistic is found to be negatively skewed, which indicates higher insolvency risk of many banks. The mean value of HHI is found to be 0.072. Based on the general interpretation of HHI, the results indicate that the market structure is unconcentrated. Likewise, the mean value of CR4 (0.369) implies that the degree of concentration is less in the Indian banking sector. On the other hand, the observed mean value of H-statistic (0.598) also indicates that there is a monopolistic competition in the banking sector. Thus, both structural and non-structural measures of bank competition reveal that the average market structure of Indian banking sector is competitive or less concentrated. Among the other explanatory variables, mention can be made about the average share of loans and advances in the assets of the banks (AC) which is almost 55%. This implies that proportion of loans and advances constitute the major component of the assets of the bank. Likewise, mean credit deposit ratio (IS) is found to be about 65%, which is also an indication that banks utilized significant quantum of deposits in the form of loans and advances. Indeed, bank lending in India has increased significantly in the during last two decades and the share of credit to GDP has increased from 35.50% in 2000 to 52% in 2015 as per the Economic Survey report of 2014-15 of the Government of India.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNPA</td>
<td>0.138</td>
<td>40.891</td>
<td>5.382</td>
<td>1.051</td>
</tr>
<tr>
<td>NNPA</td>
<td>0.010</td>
<td>18.370</td>
<td>2.606</td>
<td>1.074</td>
</tr>
<tr>
<td>Z Statistic</td>
<td>-1.099</td>
<td>6.521</td>
<td>3.579</td>
<td>-0.119</td>
</tr>
<tr>
<td>H-statistic</td>
<td>0.358</td>
<td>0.785</td>
<td>0.589</td>
<td>0.625</td>
</tr>
<tr>
<td>HHI</td>
<td>0.059</td>
<td>0.095</td>
<td>0.073</td>
<td>0.749</td>
</tr>
<tr>
<td>CR4</td>
<td>0.341</td>
<td>0.399</td>
<td>0.364</td>
<td>0.729</td>
</tr>
<tr>
<td>ROA</td>
<td>-3.496</td>
<td>5.121</td>
<td>1.227</td>
<td>-0.328</td>
</tr>
<tr>
<td>LNSIZE</td>
<td>7.073</td>
<td>14.621</td>
<td>11.000</td>
<td>-0.048</td>
</tr>
<tr>
<td>LLP</td>
<td>0.019</td>
<td>4.563</td>
<td>1.000</td>
<td>1.015</td>
</tr>
<tr>
<td>HCE</td>
<td>2.735</td>
<td>51.691</td>
<td>8.165</td>
<td>3.899</td>
</tr>
<tr>
<td>ETA</td>
<td>0.001</td>
<td>0.8687</td>
<td>0.0173</td>
<td>1.274</td>
</tr>
<tr>
<td>AC</td>
<td>0.1302</td>
<td>0.7390</td>
<td>0.5368</td>
<td>-1.173</td>
</tr>
<tr>
<td>IS</td>
<td>0.2718</td>
<td>1.1716</td>
<td>0.6634</td>
<td>0.536</td>
</tr>
<tr>
<td>GGDP</td>
<td>3.880</td>
<td>9.570</td>
<td>7.199</td>
<td>-0.418</td>
</tr>
</tbody>
</table>
Results of regression models

Observed results of the regression models 1, 2 and 3 are presented in table 3 (using H-statistic as the measure of competition), table 4 (employing HHI as the measure of competition) and table 5 (using CR4 as the measure of competition). In model 3, insolvency risk measured by Z-statistic is the dependent variable. Since Z-statistic is the measure of safety index, the higher the value of Z the lower is the insolvency risk. Hence, the actual impact of explanatory variables on the risk of the banks in case of model 3 would be opposite to the observed sign of the coefficient.

Table 3 shows that the influence of H-statistic on bank risk is negative, although the results are not statistically significant. The negative influence implies that when competition increases bank risk decreases, which supports the competition stability view. The results of table 4 indicate that the impact of HHI on bank risk is positive and the results are significant at 1% level. As per general interpretation of HHI, high value of HHI implies high concentration or low competition in the market. This suggests that when concentration increases, risk is also increases. This means that there is an inverse association between competition and risk, which is in favour of competition stability view. Likewise, the results of table 5 reveal that the impact of CR4 on bank risk is negative and the results are statistically significant. Thus, using alternative definitions of bank risk and competition, we find similar results that advocate in favour of competition stability view in the context of Indian banking sector. Our results support the empirical findings of Yeyati and Micco (2007); Tabak, et al., (2012) and Sarkar and Sensarma (2015) in emerging markets.

Among the other explanatory variables, we find negative impact of ROA on bank risk. This implies that when profits are high, banks try to decrease the risk by not indulging into risky projects to generate more returns. The results are consistent with the findings of earlier studies conducted on emerging market economies (Godlewski, 2005; Floquet and Biekpe, 2008; Maji and De, 2015; Maji and Hazarika, 2018). Bank size as a continuous variable is inversely associated with bank risk. The negative impact of SIZE on risk indicates that large banks have lower risk as compared to the small banks. In other words, large banks have the ability to manage their risk through diversification. Our result is consistent with the findings of earlier studies (Godlewski, 2005 and Awdeh, EL-Moussawi and Machrouh, 2011). The influence of LLP on risk is found to be positive and significant for all the cases. In some studies, the researchers have found negative association between LLP and credit risk (Al-Zubi, et al., 2008; Awdeh, EL-Moussawi and Machrouh, 2011). This is true when there is a high provision for credit risk and banks try to reduce the risk. However, this is not true in Indian context.

HCE is found to have negative and significant impact on bank risk. This reveals that by enhancing the efficiency of human resources, the level of bank risk can be reduced. This is consistent with the theoretical view on role of bank employees in managing risk and empirical findings of Maji and De (2015). On the other hand, the impact of ETA on bank risk is found to be positive. This implies that when the level of capital increases, banks undertake risky projects as the equity capital can be used by way of safety margin for unexpected crisis. We find negative association between AC and bank risk. The result is consistent with the theoretical view that the higher the proportion of loan assets in total assets, higher would be possibility of bank risk. On the other hand, the influence of IS on bank risk is found to be positive and significant. This indicates that when loan to deposit ratio increases, there is an increase in bank risk due to the higher probability of non-repayment of loans from borrowers. The impact of dummy variable (D_i) on risk is found to be negative and significant. This suggests that there is a significant difference between the size of bank as a categorical variable and the level of risk. The results indicate that large banks have lower risk as compared to the small banks. Finally, the growth in GDP and bank risk is negatively associated, which implies that during healthy economic conditions the money inflow is high which increases the repaying ability of borrowers and subsequently reduces bank risk. The result is consistent with the findings of Das and Ghosh (2004) and Maji and Hazarika (2016a).

The observed R² and significant F-statistic for all the cases advocate in favour of the appropriateness of the regression models used in the present context. Further, similar results are observed by employing alternative definitions of both bank risk and market competition, which indicates that the results are tenable.
### Table 3: Regression results using H-statistic as the measure of competition

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>R²</th>
<th>F-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> (Fixed Effects)</td>
<td>Constant</td>
<td>0.254</td>
<td>13.38***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMPT</td>
<td>-0.001</td>
<td>-0.331</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>-1.566</td>
<td>-7.843***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>-0.013</td>
<td>-7.699***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>2.367</td>
<td>12.27***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>-0.001</td>
<td>-4.825***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>0.085</td>
<td>3.331***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.013</td>
<td>-1.545</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>0.003</td>
<td>2.100**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>-0.016</td>
<td>-3.948***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>-0.004</td>
<td>-6.564***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2</strong> (Fixed effects)</td>
<td>Constant</td>
<td>0.113</td>
<td>9.604***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMPT</td>
<td>-0.001</td>
<td>-0.324</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>-1.019</td>
<td>-8.246***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>-0.005</td>
<td>-5.407***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>1.276</td>
<td>10.69***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>0.000</td>
<td>0.277</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>0.035</td>
<td>2.229**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.006</td>
<td>-1.287</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>0.005</td>
<td>5.618***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>-0.006</td>
<td>-2.634***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>-0.003</td>
<td>-7.812***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3</strong> (Fixed effects)</td>
<td>Constant</td>
<td>-1.427</td>
<td>-1.89**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMPT</td>
<td>0.154</td>
<td>1.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>0.489</td>
<td>8.02***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>0.335</td>
<td>5.09***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>-0.126</td>
<td>-2.39**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>0.063</td>
<td>4.50***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>-0.395</td>
<td>-0.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>0.514</td>
<td>-1.85**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>-0.177</td>
<td>-2.70***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>0.253</td>
<td>2.19**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>0.048</td>
<td>2.68***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *** and ** indicate significant at 1% and 5% level respectively; Dependent variable of models 1, 2 and 3 are GNPA, NNPA and Z-Statistic respectively.

Panel data test results:

For all the models, significant chi-square value of Breusch-Pagan test indicates the appropriateness of random effects model instead of pooled OLS. Again, the significant chi-square value of Hausman test advocates that fixed effects model is more appropriate than random effect for all the three models.
Table 4: Regression results using HHI as the measure of competition

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>R²</th>
<th>F-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constant</td>
<td>-0.136</td>
<td>-5.374***</td>
<td>0.733</td>
<td>------</td>
</tr>
<tr>
<td>(Random Effects)</td>
<td>COMPT</td>
<td>2.356</td>
<td>17.19***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>-1.577</td>
<td>-10.18***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>0.004</td>
<td>0.808</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>1.766</td>
<td>10.97***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>-0.002</td>
<td>-8.02***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>0.002</td>
<td>0.124</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.004</td>
<td>-0.775</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>-0.005</td>
<td>-1.448</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>-0.002</td>
<td>-3.716***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>0.003</td>
<td>2.752***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Constant</td>
<td>-0.137</td>
<td>-6.880***</td>
<td>0.684</td>
<td>31.86***</td>
</tr>
<tr>
<td>(Fixed Effects)</td>
<td>COMPT</td>
<td>1.478</td>
<td>14.44***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>-1.024</td>
<td>-9.775***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>0.006</td>
<td>0.920</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>0.918</td>
<td>8.808***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>-0.000</td>
<td>-1.106</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>-0.004</td>
<td>-0.344</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.004</td>
<td>-0.956</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>0.000</td>
<td>0.326</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>-0.001</td>
<td>-4.879***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>0.005</td>
<td>6.728***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Constant</td>
<td>-5.267</td>
<td>-2.64***</td>
<td>0.317</td>
<td>21.26***</td>
</tr>
<tr>
<td>(Fixed Effects)</td>
<td>COMPT</td>
<td>-0.201</td>
<td>-2.10**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>0.468</td>
<td>7.58***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>0.545</td>
<td>4.52***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>-0.149</td>
<td>-2.77***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>0.060</td>
<td>4.25***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>-0.626</td>
<td>-0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.539</td>
<td>-1.94**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>-0.163</td>
<td>-2.48**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>0.262</td>
<td>2.28**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>0.070</td>
<td>3.45***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *** and ** indicates significant at 1% and 5% level; Dependent variable of model 1, 2 and 3 are GNPA, NNPA and Z statistic respectively.
Panel data test results:
For all the models, significant chi-square value of Breusch-Pagan test indicates the appropriateness of random effect model instead of pooled OLS. Again, the significant chi-square value of Hausman test advocates that fixed effects is appropriate than random effect f or model 2 and 3. However random effects model is more appropriate than fixed effects for model 1.
In case of random effects, F-statistic is not appropriate.
### Table 5: Regression Results using CR as the measure of competition

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>( R^2 )</th>
<th>F-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Fixed Effects)</td>
<td>Constant</td>
<td>-0.143</td>
<td>-3.259***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMPT</td>
<td>0.908</td>
<td>9.855***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>-1.479</td>
<td>-8.042***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>-0.009</td>
<td>-5.635***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>2.16</td>
<td>12.13***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>-0.002</td>
<td>-6.725***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>0.056</td>
<td>2.393**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.011</td>
<td>-1.420</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>-0.016</td>
<td>-4.353***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>-0.000</td>
<td>-0.942</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>0.003</td>
<td>2.791***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (Random Effects)</td>
<td>Constant</td>
<td>-0.122</td>
<td>-4.658***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMPT</td>
<td>0.524</td>
<td>9.221***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>-0.978</td>
<td>-9.163***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>-0.002</td>
<td>-2.990***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>1.197</td>
<td>10.98***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>-0.000</td>
<td>-1.503</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>-0.006</td>
<td>1.499</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.018</td>
<td>-1.485</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>-0.006</td>
<td>-2.838***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>-0.001</td>
<td>-2.412**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>0.005</td>
<td>7.292***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (Fixed Effects)</td>
<td>Constant</td>
<td>-1.236</td>
<td>-1.286</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMPT</td>
<td>1.750</td>
<td>0.914</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROA</td>
<td>0.476</td>
<td>7.882***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>0.246</td>
<td>3.697***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LLP</td>
<td>-12.095</td>
<td>-2.296**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HCE</td>
<td>0.065</td>
<td>4.782***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETA</td>
<td>-0.436</td>
<td>-0.437</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>-0.426</td>
<td>-1.549</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dsize</td>
<td>0.476</td>
<td>4.184***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GGDP</td>
<td>0.056</td>
<td>2.969***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS</td>
<td>-0.183</td>
<td>-2.835***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *** and ** indicate significant at 1% and 5% level respectively; Dependent variable of model 1, 2 and 3 are GNPA, NNPA and Z statistic respectively.

Panel data test results:
For this model, significant chi-square value of Breusch-Pagan test indicates the appropriateness of random effects model instead of pooled OLS. Again, the significant chi-square value of Hausman test advocates that fixed effects model is more appropriate than random effect in case of model 1 and 3, whereas random effects model is appropriate in case of model 2.
5. Conclusion

The present study is a modest attempt to investigate whether the competition fragility or competition stability view is prevailed in the Indian banking sector. The results indicate that there is an inverse association between bank competition and risk, which supports the competition stability view. Among the other explanatory variables, ROA, GGDP, bank size and AC are found to be negatively associated with bank risk. It is important to note here that the impact of HCE on bank risk is observed to be significantly negative except some cases when NNPA is used to measure bank risk. The insignificant influence of HCE on NNPA is also quite expected because there is a direct link between the efficiency of human resources and reduction in gross NPAs. But net NPAs are computed by deducting some items like balance in interest suspense account, part payment received and kept in suspense account and total provisions held from gross NPAS, which are not directly associated with the efficiency or inefficiency of bank employees engaged in the credit related activities. On the other hand, LLP, ETA and IS are positively associated with bank risk.

The outcome of the study has the following policy implications. First, the inverse association between competition and risk suggests that competition improves the banking stability. Since, competition decrease the profit margin and customer base on one hand and eliminates the chances of inefficiency in the market on the other, it is important to enhance the operational efficiency to increase the interest spread. Working in a tough competitive environment, Indian banks should focus on enhancing operational efficiency for reducing risk, which ultimately boost the stability in the banking system. Second, the findings indicate negative influence of profitability on risk of Indian banks. This suggests that increase in profitability can reduce the level of risk in Indian banks. Profitability can be improved by enhancing the interest spread and through product diversification. In this respect, efficient utilization of workforce is essential. Third, human capital efficiency is negatively related with the level of risk of Indian banks. This indicates that bank employees play a vital role in reducing the risk and maintaining stability of banks. Thus, banks should try to enhance the skill and knowledge of the employees through adequate training & orientation programs and by providing sufficient infrastructure. This is consistent with the reports of National Skill Development Corporation of India and McKinsey & Company [1] that the human resources are the key success factor for the long term stability of banks and financial institutions in India.


References


Indian banks in a simultaneous approach, Managerial Finance, 44(4), 459-477.


************
With the proliferation of Over the Top (OTT) Video streaming services, researchers are beginning to understand that the 'human' factor along with system design plays a crucial role in understanding the user's technology adoption issues. Framed in quantitative paradigm, this study explores the concept of user-centric perspectives for OTT Video Recommendation Systems from an Indian perspective with the aim of identifying elements of an effective video recommender system that influence its adoption. Findings are derived by assessing recommender effectiveness through the user perceived quality and adoption determinants that in turn influence behavioral intention to use. The findings set the precedent for possible opportunities for OTT video service providers to determine aspects that affect user attitudes and behavioural intentions towards the recommender systems.

**Key Words:** Personalization Phenom, Indian Video Services, User-centric Perspectives, Operationalization of Variables.
Increasing internet penetration and android device proliferation have paved the way for rapid growth in the consumption of content in digital platforms in India, with consumers leaning towards audio-visual content for entertainment (“Digital Media: Rise of On-demand Content-Deloitte US” 2017). Statistics showed Internet users in India spending 17% of their monthly income for entertainment, with 21% of the youth highly engaged with audio and video streaming content and spending per month was expected to grow by 2.5 times by 2020. (Digital to overtake traditional media by 2021-22). This has resulted in the rise of Video On Demand or Over The Top services. Video on demand service provides films and television programmes through internet. The Indian OTT sector is expected to enter the global market with 22.6% CAGR by 2022. The rapid growth in the OTT service revenue is also visible in recent years. OTT service providers in India deliver regional, national and international content to the audience. Hotstar, Amazon Prime, Sony Liv, Netflix and Voot are the major players, with Hotstar holding prime position in the Indian OTT market ("Here's Why Indian Telecom Industry Cannot Ignore Content Players Like Netflix, Hotstar", 2018).

A recommender system proposes objects of interest based on to consumers’ implicitly specified choice or behaviour. Moving ahead of research on Recommender system evaluations that have conventionally concentrated on the performance of algorithms (Herlocker et al. 2004; Wu et al. 2013), recent studies have focussed on exploring the effectiveness of the recommender system from users’ perspective (Pu et al. 2012; Park et al. 2011). A better implementation of a recommendation system can create a good impression among the customers and will improve the loyalty of consumers. By providing more information regarding their preference about products, they can experience various contents recommended by the system. This leads to more satisfaction of the user (Hostler et al. 2012).

While searching for video content on OTT platforms, consumers face the problem of information overload, leading to difficulty in finding a specific programme according to their interest. According to Madhukar (2014), there are inherent problems such as data sparsity (where users rate only a few items from the large data), cold start (where the personal profile and preferences of new users will be unknown to the recommendation engine) and scalability (the increasing number of users and items leads to excessive computational workload to the system). Thus, the reduction of information overload is a major concern for OTT users (Liang et al., 2006). In this scenario, a recommendation system suggests algorithm-based solution by typification of content created through the user's preference and interest (Burke, 2002). The system identifies the interest of user based on his or her purchase history, personal profiles and the rating the person given to a product (Fleder and Hosanagar, 2009). The recommender system helps consumers to reduce their effort in searching for a desired video by filtering large content to a smaller niche list (Haubl and Trifts, 2000). The system is beneficial for both consumers as well as providers. Information regarding the preferences and interest of people collected through online information systems can be used for product design and marketing plans by the company (Liang et al., 2006). By carefully suggesting relevant content to the people, the sales volume and profits of the producer can be increased. (Wu et al., 2013).

A personalized recommender service is a short term, interactive experience implemented for a consumer who is also a co-creator of value (Fitzsimmons and Fitzsimmons, 2008). All OTT/VOD systems collect colossal volumes of data from streaming service users daily, allowing them to study each individual user's taste, thus paving the way for companies to effectively personalize their services for increasing profit in addition to developing user satisfaction and loyalty. (Markman, 2017). Various early studies echo the findings showing the positive result of personalization on consumer satisfaction (Liang et al., 2007; Adolphs and Winkelmann 2010). Personalized customer services may create strong emotional ties between service providers and clients (Saari et al., 2004).

**Literature Review**

Majority of the recommendation systems sort out information through (i) collaborative and (ii) content based filtering. Collaborative filtering recommends items built around the behaviour of user. Here the system analyses the behaviour of users who have similar preferences, and groups. Then the system suggests content by calculating the majority response from the group regarding a previous item. Purchase history and rating are assessed for making a decision in collaborative filtering. Content based or cognitive filtering recommends items based on its characteristics. This is done by studying user profiles. It includes the details of the user and his taste. If a person had watched a particular content in the past, the system recommends items related to the keywords of the programme (Aggarwal, et al., 2017).
Recommender systems aid in increasing profits for commercial OTT video service providers by effectively influencing consumers to view/choose items suggested to them. Pearl, Pu et al. (2012) found positive correlation between consumer spend and use of recommender systems. Thus it is imperative for OTT video service providers to ensure quality in the process of recommending content, efficacy of the system in offering suggestions, information clarity, transparency and sufficiency in elucidating the reasons for its recommendations, and motivating users to view the recommended content. All these depend profoundly on users’ overall content of the recommendation system. Wu et al. 2013 study in this context is an eye-opener for OTT video service providers looking to effectively integrate recommendations across the viewing experience - from content discovery to the final viewing spectrum. The study revealed that the availability of recommendation systems generated user satisfaction at the product level, but did not make any significant change in the satisfaction towards the recommender system itself. While high accuracy of recommendation can be obtained through algorithmic means, issues associated with personalization of recommendation for the viewer that could finally lead to long-term user satisfaction towards the recommender service can only be efficiently explored through first-hand data analysis from real users.

Liang et al. (2006) posited three important theories showing a symbiotic relationship between personalized content and user satisfaction: (i) information overload (ii) uses and gratification and (iii) user involvement. The information overload theory suggests a linear relationship between user satisfaction and accuracy of consumer interest-based recommended content fit. The uses and gratifications theory implies correlation between user satisfaction and consumer stimuli for information access. The user involvement theory posits user preference for content recommended through their explicit participation.

It is a known factor that personalization playing a major role in the popularity of content providers. But older available literature did not give sufficient proof regarding user like/dislike towards the personalized service (Liang et al., 2006). It is essential for a recommendation service to build a valuable user experience and increase user satisfaction (Hijikata et al., 2014). User experience is related to system, process and outcome (Knijnenburg et al. 2012). Algorithmic accuracy alone may not lead to change or increase in user’s satisfaction and purchasing or viewing content (Wu, et al. 2013). The system aspects are equally important to understand the user experience and technology adoption issues (Jones and Pu, 2007), making the user's assessment towards recommendation system an essential subject of study (Pu et al. 2011).

Users have various preferences towards recommendation system on the basis of diversity, serendipity and popularity. Their personality traits influence the preference and satisfaction level (Nguyen et al., 2017). There is an urgent need for studying user perception of the quality of recommendation and their system acceptance level which includes perceived ease of use and perceived usefulness that would lead to the overall satisfaction (Pu and Chen, 2008). The perceived qualities such as accuracy and novelty of the items recommended are the major elements that contribute to the attractiveness of the system for the users (Jones and Pu, 2007). Transparency and recommendation of popular items are also influence the user's favourable perception towards recommendation system (Swearingen and Sinha, 2002). Tintarev and Masthoff (2012) identified transparency, scrutability, trust, effectiveness, persuasiveness and efficiency as the major enhancers of users’ satisfaction towards recommender systems. Dooms et al. 2011 study on user evaluation of recommender algorithm found no significant relationship between diversity of content and satisfaction and trust of users towards the system while recommendation accuracy and transparency were highly correlated.

Ozok et al. (2010) user-perspective based study of recommender systems came up with a two-fold analysis of the external (the structure of the recommender systems) and internal (the content within the system) aspects. The researchers suggested fourteen design guidelines for the external (the placement of the recommended products) and internal (product attribute description) but failed to elucidate how usability issues impact user intention towards recommended items, continued use and endorsing the system to their associates.

**Objectives of the Study**

While traditional TV has a regular rating method (such as TRP), OTT service is bereft of such a system. Most of the OTT viewership and rating information is proprietary, as there is no advertising based revenue involved negating the need for disclosing data (Mittell, 2016). Since primary data is unavailable, it is challenging to measure satisfaction with the personalization effort by the recommender system. By gathering and assessing first-hand data from Indian Video OTT users, this study provides a better understanding of the
association between the viewer and the service provider's recommendation system, as well as an indication of customer gratification with the system.

**Methodology**

**Period of study and Sampling methodology**

The study is framed in quantitative paradigm. Online questionnaires were sent to 400 Indian Video OTT consumers during the months of October to November 2018 and 366 responses were received. These were used to identify perception and evaluation of video recommendation systems. Stratified sampling procedure was used for the selection of respondents for the study collected from Tier I, II and III cities in 4 southern states in India (Kerala, Tamil Nadu, Karnataka and Andhra Pradesh). The respondents were between the ages of 15 to 70.

**Operationalization of Variables**

The online questionnaire (based on the variables discussed by Pu et. al (2012); that included Technology Acceptance Model (TAM) variables (Davis, 1989); Perceived Ease of Use, Perceived Usefulness and Use Intentions; had three sections. The first section included demographics such as age, gender, educational qualification, location and income. Section 2 was designed to collect information about the user awareness and patterns of use of recommendation systems. Section 3 included scale questions with regard to User Perceived Quality (qualified by seven sub-sections including recommendation explanation, interaction adequacy, recommendation accuracy, novelty, diversity, interface adequacy, information sufficiency), User Beliefs (with 4 sub-sections namely Transparency, Control, Perceived Usefulness and Perceived ease of Use), User Attitude (Trust & Confidence and Overall Satisfaction) and behavioral intentions (Recommender Use intention and Product Watching Intention). Section 3 questions were on a five point Likert scale ranging from Strongly Agree to Strongly Disagree.

Pu et al. (2012) set of user-centric variables were validated as a well-balanced framework for assessing how successful a recommendation system is terms of its adoption by users, and how its perceived qualities impact user beliefs and attitudes, and motivate use intentions. Pu et al. (2012) framework is validated through the use of decision theory, accuracy, effort measurement and user-trust model. Adequacy of the variables can be explained by the fact that the authors conducted multiple user experiments prior to establishing the final framework consisting of the exogenous variables

**Research Question and Hypothesis formulation**

From the literature reviewed, the following research questions and hypothesis were framed;

RQ1: Does user perceived quality of a video recommendation system influence user belief towards recommendation systems?

RQ2: Does user belief influence user attitude towards recommendation systems?

Rq3: Does user attitude towards video recommendation systems influence behavioural intentions to view/use recommendation systems?

H1: User perceived quality of a video recommendation system influences user belief towards recommendation systems.

H2: User belief influences user attitude towards recommendation systems.

H3: User attitude towards video recommendation systems influences behavioural intentions to view/use recommendation systems.

The conceptual model (adapted from Pu et al., 2012) used in this study (Figure 1) hypothesizes that User Perceived Quality of recommendation systems has an effect on User Belief about the system. This in turn influences their attitude towards the system which finally decides the consumer's intention to use the system and watch the recommended items.

**Data Analysis**

Demographic data analysis revealed a higher percentage of female respondents across age groups. The participants were heavily skewed toward the higher income category. The most preferred OTT service was Hotstar, followed by Netflix and Amazon Prime. Majority of participants preferred using smartphones, laptops/desktops for streaming movies, TV shows and serials on a daily basis. Close to 74% of the participants had their own Video OTT subscription, 17% of the participants reported that they used someone else's account, while 9% declared that they had cancelled their subscription. In terms of frequency of use, 34% of participants used the OTT service on a daily basis. Participants belonging to the middle age group showed higher frequency of streaming. Also, participants who had higher levels of education accessed OTT services more often. Regular streamers had a greater likelihood have their own subscription. ($X^2 = 45.909$, df =10, $p = .000$). In addition, a large content catalog and exclusive programs were the main reasons for users to subscribe for the OTT. Older respondents were more likely to choose recommendation system based content ($X^2= 18.767$, df =8, $p = .016$).
Reliability of the constructs was tested and found to be above 0.50 (Table 1). Table 2 presents the descriptive statistics of the constructs. The dependence of one variable over another is statistically found by using Pearson Correlation and Multiple Regression on the Statistical Package for Social Sciences (SPSS).

**Table 1: Reliability Analysis**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Reliability (Cronbach's α)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USER PERCEIVED QUALITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Explanation</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2. Interaction Adequacy</td>
<td>3</td>
<td>0.873</td>
</tr>
<tr>
<td>3. Recommendation Accuracy</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>4. Recommendation Novelty</td>
<td>2</td>
<td>0.586</td>
</tr>
<tr>
<td>5. Recommendation Diversity</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>6. Information Sufficiency</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>7. Interface Adequacy</td>
<td>4</td>
<td>0.868</td>
</tr>
<tr>
<td><strong>USER BELIEFS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Transparency</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2. Control</td>
<td>3</td>
<td>0.854</td>
</tr>
<tr>
<td>3. Perceived Usefulness</td>
<td>3</td>
<td>0.813</td>
</tr>
<tr>
<td>4. Perceived Ease of Use</td>
<td>2</td>
<td>0.811</td>
</tr>
<tr>
<td><strong>USER ATTITUDES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Trust and Confidence</td>
<td>4</td>
<td>0.813</td>
</tr>
<tr>
<td>2. Overall Satisfaction</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><strong>BEHAVIOURAL INTENTIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Viewing Intentions</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2. Use Intentions</td>
<td>3</td>
<td>0.755</td>
</tr>
</tbody>
</table>

**Table 2: Descriptive Statistics of Constructs**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Perceived Quality</td>
<td>366</td>
<td>13.00</td>
<td>58.00</td>
<td>31.1393</td>
<td>6.83262</td>
</tr>
<tr>
<td>User Beliefs</td>
<td>366</td>
<td>9.00</td>
<td>37.00</td>
<td>20.5464</td>
<td>5.06849</td>
</tr>
<tr>
<td>User Attitudes</td>
<td>366</td>
<td>5.00</td>
<td>23.00</td>
<td>12.0792</td>
<td>3.46280</td>
</tr>
<tr>
<td>Behavioural Intentions</td>
<td>366</td>
<td>4.00</td>
<td>19.00</td>
<td>9.3306</td>
<td>2.50534</td>
</tr>
</tbody>
</table>

**Correlation**

A Pearson product-moment correlation coefficient was computed to assess the relationship between the main variables Behavioural intentions of user of recommendation system, Perceived User Quality, User Beliefs, User Attitudes. Table 3 shows the correlation statistics Overall, Behaviour intentions of users are predominantly positively predicted by User Attitudes \( r = .747, p < .001 \) followed by User Beliefs \( r = .647, p < .001 \) and user Perceived Quality \( r = .621, p < .001 \) (Table 3). Behavioural intention of user is in turn significantly determined by intention of the consumer to use the Recommendation system to choose the content (Table 4).
Table 3: Inter Construct Prediction factors  
(User Perceived Quality* User Beliefs* User Attitudes* Behavioural Intentions)

<table>
<thead>
<tr>
<th></th>
<th>User Perceived Quality</th>
<th>User Belief</th>
<th>User Attitudes</th>
<th>Behavioural Intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Perceived Quality</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Beliefs</td>
<td>.726** (0.000)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Attitudes</td>
<td>.695** (.000)</td>
<td>.691** (.000)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Behavioural Intentions</td>
<td>.621** (.000)</td>
<td>.647** (.000)</td>
<td>.747** (.000)</td>
<td>1</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4: Factors that predict Behavioural Intention

<table>
<thead>
<tr>
<th></th>
<th>Use Intention</th>
<th>Behavioural Intention</th>
<th>Viewing Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Intention</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioural Intention</td>
<td>.965** (.000)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Viewing Intention</td>
<td>.528** (.000)</td>
<td>.731** (.000)</td>
<td>1</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

This shows that a consumer decides to use the recommendation system to choose content to view primarily led by the trust, confidence and satisfaction he/she has for the recommendation system. Thus recommendation service providers must keep this in mind in order to influence the consumer to use the service.

Pearson product-moment correlation coefficient for the other three constructs and their sub variables are as follows: User Perceived Quality with its sub-variables – Explanation, Interface Adequacy, Interaction Adequacy, Recommendation Accuracy, Recommendation Novelty, Recommendation Diversity and Information Sufficiency- showed highest positive correlated with Interface Adequacy ($r = .813, p< .001$) followed by Interaction Adequacy ($r = .756, p< .001$) and Recommendation novelty ($r = .695, p< .001$). This is followed by Information Sufficiency ($r = .649, p< .001$), Explanation Recommendation Accuracy ($r = .617, p< .001$), Explanation ($r = .622, p<.001$) and Diversity ($r = .534, p<.001$) (Table 5). Thus a consumer perceives higher quality in a recommendation system if the system has clarity, attractiveness and adequacy in terms of information labels and layout; is adaptable enough to recommend content based on the consumer’s likes/dislikes, and novelty of content recommended.
Table 5: Factors that predict User Perceived Quality

<table>
<thead>
<tr>
<th>User Perceived Quality</th>
<th>Explanation</th>
<th>Interface Adequacy</th>
<th>Interaction Adequacy</th>
<th>Recommendation Accuracy</th>
<th>Recommendation Novelty</th>
<th>Recommendation Diversity</th>
<th>Information Sufficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Perceived Quality</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explanation</td>
<td>.622*** (.000)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface Adequacy</td>
<td>.813*** (.000)</td>
<td>.385*** (.000)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction Adequacy</td>
<td>.756*** (.000)</td>
<td>.387*** (.000)</td>
<td>.408*** (.000)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation Accuracy</td>
<td>.617*** (.000)</td>
<td>.332*** (.000)</td>
<td>.424*** (.000)</td>
<td>.368*** (.000)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation Novelty</td>
<td>.695*** (.000)</td>
<td>.363*** (.000)</td>
<td>.479*** (.000)</td>
<td>.388*** (.000)</td>
<td>.474*** (.000)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Recommendation Diversity</td>
<td>.534*** (.000)</td>
<td>.420*** (.000)</td>
<td>.327*** (.000)</td>
<td>.268*** (.000)</td>
<td>.304*** (.000)</td>
<td>.386*** (.000)</td>
<td>1</td>
</tr>
<tr>
<td>Information Sufficiency</td>
<td>.649*** (.000)</td>
<td>.351*** (.000)</td>
<td>.476*** (.000)</td>
<td>.414*** (.000)</td>
<td>.404*** (.000)</td>
<td>.444*** (.000)</td>
<td>.216*** (.000)</td>
</tr>
</tbody>
</table>

User Beliefs are strongly positively predicted by Perceived Usefulness (giving good content suggestions and helping find ideal items) and Control (allowing user to modify profile according to his/her taste in content) followed by Perceived Ease of Use (familiarity with the system) and Transparency (why the items were recommended) (Table 6). User Attitude is driven by Trust and Confidence in the Recommendation system followed by Overall Satisfaction (Table 7).

Table 6: Factors that predict User Beliefs

<table>
<thead>
<tr>
<th>Perceived Usefulness</th>
<th>Control</th>
<th>Transparency</th>
<th>Perceived Ease of Use</th>
<th>User Beliefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>566*** (.000)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transparency</td>
<td>.508*** (.000)</td>
<td>.403*** (.000)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>.533*** (.000)</td>
<td>.367*** (.000)</td>
<td>.439*** (.000)</td>
<td>1</td>
</tr>
<tr>
<td>User Beliefs</td>
<td>.868*** (.000)</td>
<td>.818*** (.000)</td>
<td>.661*** (.000)</td>
<td>.717*** (.000)</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**

Table 7: Factors that predict User Attitudes

<table>
<thead>
<tr>
<th>Trust and Confidence</th>
<th>Overall Satisfaction</th>
<th>User Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust and Confidence</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Overall Satisfaction</td>
<td>.619*** (.000)</td>
<td>1</td>
</tr>
<tr>
<td>User Attitudes</td>
<td>.985*** (.000)</td>
<td>.747*** (.000)</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**
Regression Path
The path analysis for regression was as follows:
Perceived User Quality, User Beliefs, User Attitudes → Behavioural Intentions
Perceived User Quality, User Beliefs → User Attitudes
Perceived User Quality → User Beliefs

Apart from the above, a TAM path analysis for regression was:
Perceived Ease of Use, Perceived Usefulness → Use Intention
Perceived Ease of Use → Perceived Usefulness

Multiple regression was run along the specified regression path. The data was checked for multi-collinearity and the Variance Inflation Factor (VIF) was found to be below 2.273 for all variables, which is well under the desired VIF of 10.

Table 8a: Transparency = α + β, Explanation + β, Interaction Adequacy + β, Recommendation Accuracy + β, Recommendation Novelty + β, Recommendation Diversity + β, Information Sufficiency + β, Interface Adequacy + ε

<table>
<thead>
<tr>
<th>Parameters</th>
<th>β</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.185</td>
<td>2.277</td>
<td>0.023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction adequacy</td>
<td>0.121</td>
<td>0.065</td>
<td>4.150</td>
<td>0.000</td>
<td>1.500</td>
</tr>
<tr>
<td>Recommendation Accuracy</td>
<td>0.231</td>
<td>0.019</td>
<td>2.228</td>
<td>0.026</td>
<td>1.427</td>
</tr>
<tr>
<td>Information Sufficiency</td>
<td>0.167</td>
<td>0.055</td>
<td>2.972</td>
<td>0.003</td>
<td>1.533</td>
</tr>
<tr>
<td>Interface Adequacy</td>
<td>0.125</td>
<td>0.018</td>
<td>2.170</td>
<td>0.031</td>
<td>1.613</td>
</tr>
</tbody>
</table>

Table 8b: Control = α + β, Explanation + β, Interaction Adequacy + β, Recommendation Accuracy + β, Recommendation Novelty + β, Recommendation Diversity + β, Information Sufficiency + β, Interface Adequacy + ε

<table>
<thead>
<tr>
<th>Parameters</th>
<th>β</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.447</td>
<td>3.802</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction adequacy</td>
<td>0.339</td>
<td>0.047</td>
<td>6.584</td>
<td>0.000</td>
<td>1.500</td>
</tr>
<tr>
<td>Recommendation Novelty</td>
<td>-0.091</td>
<td>0.135</td>
<td>2.906</td>
<td>0.004</td>
<td>1.615</td>
</tr>
<tr>
<td>Interface Adequacy</td>
<td>0.124</td>
<td>0.044</td>
<td>2.282</td>
<td>0.023</td>
<td>1.613</td>
</tr>
</tbody>
</table>
User beliefs about perceived quality of the recommendation systems stem from the clarity and adequacy of the system interface, system understanding of the user likes/dislikes and its ability to match content with the interest of the user.

Path relationships for Perceived User Quality, User Beliefs and User Attitudes constructs:

Across Perceived User Quality and User Beliefs constructs, Information Sufficiency and Perceived Usefulness are the predominant determinants of User Attitudes. 'Overall Satisfaction' and 'Trust and Confidence' under the construct User Attitude are predominantly and recurrently influenced by Perceived Usefulness and Information Sufficiency (bolded and italicized in tables 9a and 9b), 'Trust and Confidence‘ is affected also by Explanation, Interaction Adequacy, Recommendation Diversity, Interface Adequacy and Transparency. This proves H2 as true.
Table 9a: Trust and Confidence = $\alpha + \beta_1$Explanation + $\beta_2$Interaction Adequacy + $\beta_3$Recommendation Accuracy + $\beta_4$Recommendation Novelty + $\beta_5$Recommendation Diversity + $\beta_6$Information Sufficiency + $\beta_7$Interface Adequacy + $\beta_8$Transparency + $\beta_9$Control + $\beta_{10}$Perceived Usefulness + $\beta_{11}$Perceived Ease of use + $\varepsilon$

<table>
<thead>
<tr>
<th>Parameters</th>
<th>$\beta$</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.519</td>
<td>0.281</td>
<td>0.779</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explanation</td>
<td>0.139</td>
<td>0.126</td>
<td>3.219</td>
<td>0.001</td>
<td>1.462</td>
</tr>
<tr>
<td>Interaction Adequacy</td>
<td>0.115</td>
<td>0.058</td>
<td>2.445</td>
<td>0.015</td>
<td>1.724</td>
</tr>
<tr>
<td>Recommendation Diversity</td>
<td>0.104</td>
<td>0.154</td>
<td>2.473</td>
<td>0.014</td>
<td>1.376</td>
</tr>
<tr>
<td>Information Sufficiency</td>
<td>0.126</td>
<td>0.154</td>
<td>2.779</td>
<td>0.006</td>
<td>1.601</td>
</tr>
<tr>
<td>Interface Adequacy</td>
<td>0.097</td>
<td>0.053</td>
<td>2.034</td>
<td>0.043</td>
<td>1.780</td>
</tr>
<tr>
<td>Transparency</td>
<td>0.128</td>
<td>0.154</td>
<td>2.880</td>
<td>0.004</td>
<td>1.547</td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>0.275</td>
<td>0.079</td>
<td>5.110</td>
<td>0.000</td>
<td>2.273</td>
</tr>
</tbody>
</table>

$R^2 = 0.549$  $ Adj. R^2 = 0.535$  $ F value = 39.105$  $ Sig value = 0.000$

Table 9b: Overall Satisfaction = $\alpha + \beta_1$Explanation + $\beta_2$Interaction Adequacy + $\beta_3$Recommendation Accuracy + $\beta_4$Recommendation Novelty + $\beta_5$Recommendation Diversity + $\beta_6$Information Sufficiency + $\beta_7$Interface Adequacy + $\beta_8$Transparency + $\beta_9$Control + $\beta_{10}$Perceived Usefulness + $\beta_{11}$Perceived Ease of use + $\varepsilon$

<table>
<thead>
<tr>
<th>Parameters</th>
<th>$\beta$</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.153</td>
<td>0.135</td>
<td>0.893</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Sufficiency</td>
<td>0.136</td>
<td>0.045</td>
<td>2.703</td>
<td>0.007</td>
<td>1.601</td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>0.277</td>
<td>0.023</td>
<td>4.618</td>
<td>0.000</td>
<td>2.273</td>
</tr>
</tbody>
</table>

$R^2 = 0.438$  $ Adj. R^2 = 0.420$  $ F value = 25.046$  $ Sig value = 0.000$

Recommendation systems that have adequate information that allows users to make decisions about watching content, and also affords them good suggestions about content are able to motivate users to invest trust and confidence in their capabilities and also derive satisfaction from the use of the system.

Path relationships for Perceived User Quality, User Beliefs, User Attitudes and Behavioural Intentions constructs:

Trust and Confidence seems to be the predominant and recurrent determinant of Behavioural Intentions—to use the system in order to view recommended content (bolded and italicized in Tables 10a and 10b). Viewing Intention is also highly influenced by Overall Satisfaction with the recommendation system followed by Interaction adequacy. Thus H3 is proved to be true.
Table 10a: Viewing Intention = α + β₁ Explanation + β₂ Interaction Adequacy + β₃ Recommendation Accuracy + β₄ Recommendation Diversity + β₅ Recommendation Novelty + β₆ Information Sufficiency + β₇ Interface Adequacy + β₈ Transparency + β₉ Control + β₁₀ Perceived Usefulness + β₁₁ Perceived Ease of use + β₁₂ Trust and Confidence + β₁₃ Overall Satisfaction + eᵣ

<table>
<thead>
<tr>
<th>Parameters</th>
<th>β</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.160</td>
<td>1.988</td>
<td>0.047</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction Adequacy</td>
<td>0.129</td>
<td>0.018</td>
<td>2.312</td>
<td>0.021</td>
<td>1.758</td>
</tr>
<tr>
<td>Trust and Confidence</td>
<td>0.163</td>
<td>0.017</td>
<td>2.473</td>
<td>0.014</td>
<td>2.445</td>
</tr>
<tr>
<td>Overall Satisfaction</td>
<td>0.205</td>
<td>0.059</td>
<td>3.478</td>
<td>0.001</td>
<td>1.963</td>
</tr>
</tbody>
</table>

R² = 0.378  Adj. R² = 0.355  F value = 16.461  Sig value = 0.000

Table 10b: Use Intention = α + β₁ Explanation + β₂ Interaction Adequacy + β₃ Recommendation Accuracy + β₄ Recommendation Diversity + β₅ Recommendation Novelty + β₆ Information Sufficiency + β₇ Interface Adequacy + β₈ Transparency + β₉ Control + β₁₀ Perceived Usefulness + β₁₁ Perceived Ease of use + β₁₂ Trust and Confidence + β₁₃ Overall Satisfaction + β₁₄ Viewing Intention + eᵣ

<table>
<thead>
<tr>
<th>Parameters</th>
<th>β</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.340</td>
<td>7.924</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation Accuracy</td>
<td>0.108</td>
<td>0.121</td>
<td>2.464</td>
<td>0.014</td>
<td>1.660</td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>0.231</td>
<td>0.054</td>
<td>4.276</td>
<td>0.000</td>
<td>2.525</td>
</tr>
<tr>
<td>Trust and Confidence</td>
<td>0.394</td>
<td>0.037</td>
<td>7.371</td>
<td>0.000</td>
<td>2.487</td>
</tr>
<tr>
<td>Viewing Intention</td>
<td>0.143</td>
<td>0.112</td>
<td>3.313</td>
<td>0.001</td>
<td>1.608</td>
</tr>
</tbody>
</table>

R² = 0.596  Adj. R² = 0.580  F value = 36.955  Sig value = 0.000

The more the user trusts the content recommended by the system and feels confident that he/she will like the recommended content, the higher the chances are that he/she will intend to use the system's recommendation system providers must first cross the hurdle of the 'leap of faith' of the consumer, build conviction and then hope for loyalty of use.

TAM Path relationships

Use Intention is affected directly by Perceived Usefulness and indirectly by Perceived Ease of Use (Tables 11a and 11b). When the system is seen as giving good suggestions for items and helps find ideal items, the user develops the motivation to use the system. The more the user uses the system; he/she becomes familiar with it and is able to find the content quickly.

Table 11a: Use Intention = α + β₁ Perceived Usefulness + β₂ Perceived Ease of Use + eᵣ

<table>
<thead>
<tr>
<th>Parameters</th>
<th>β</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.313</td>
<td>7.924</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>0.613</td>
<td>0.048</td>
<td>12.874</td>
<td>0.000</td>
<td>1.396</td>
</tr>
</tbody>
</table>

R² = 0.460  Adj. R² = 0.406  F value = 125.990  Sig value = 0.000
Table 11b: Perceived Usefulness = $\alpha + \beta \cdot \text{Perceived Ease of Use} + \epsilon$

<table>
<thead>
<tr>
<th>Parameters</th>
<th>$\beta$</th>
<th>Std Error</th>
<th>t-value</th>
<th>Sig. value</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.276</td>
<td></td>
<td>13.947</td>
<td>0.000</td>
<td>1.00</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>0.533</td>
<td>0.063</td>
<td>12.011</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Results and Interpretation

The study sheds light on four significant relations between the consumer and the recommender system: perceived system quality, user beliefs, attitudes towards the system and behavioral intention to use/view. This study endorses the fact that a technology must also be easy to use and comprehend for its diffusion and acceptance. This study also advances the fact that algorithmic usefulness of recommendation system can only stem from a basic understanding of human personal and situational traits such as perception, attitude, belief and behavior of use – in other words, the “Personalization phenom.” It presents a detailed analysis to explicate reasons for users to be partial towards a specific recommender system and the user experience process that leads to it (which may not be all algorithm based). The most impactful construct for Behavioural Intentions is User Attitude in terms of Trust and Confidence i.e. the recommendation system's ability to convince users to trust it enough to use the content recommended to them.

Variables contributing towards Recommendation System Usage Intention are Interaction Adequacy and Recommendation Accuracy (from the construct User Perceived Quality), Perceived Usefulness (from the User Belief construct), Trust and Confidence and Overall Satisfaction (from the User Attitude construct), and Recommended Content Viewing Intention.

Data in this study points towards User Perceived Quality, User Beliefs and User Attitudes are important precedents of a. OTT Video recommender use system among Indian Users sampled in this study. The association between algorithmic precision and user experience is a central question that most researchers as well as OTT service providers seek to answer. For OTT video service providers, this study advances the notion of bringing in more user perspective-based recommender systems.

Conclusion and Summary

The framework used in this study while helping advance a significant explanation of the universal physiognomies of user experience of recommendation systems, also provides for a theoretical and managerial contribution in the Indian perspective, with the ability to compare and contrast 'culturally situated' user perceived beliefs and attitudes. While corroborating the notion of user experience being theoretically situated within MacKenzie and Wajcman's (1985) Social Shaping of Technology context, this study advances the idea of a looped human-computational approach that would allow a tailored approach towards recommendation services - how the strategic design and application of recommendation systems could be patterned by a variety of socio-economic factors.

The findings of the study point towards possibilities of new recommender system experiments situated within an in-depth understanding of user perspective. This analysis goes past algorithmic considerations to explain why users prefer a certain recommender system based on their experience. The study emphasizes on the integrating algorithmic analysis with other recommender system aspects along with personal characteristics of real users, in order to advance a full consideration of the user experience.

For recommendation system providers, the user-centric focus provides a binocular view of the customer, who may have different touch points of experience apart from algorithmic accuracy. The study also advances a framework for academic researchers to observe real-world effect of circumstantial and personal traits that mediate user experience of recommendation systems that can be antecedent inputs for situation-responsive recommendation systems.

References:


Health Consciousness as an Enabler for Exploratory Buying Behavior among Consumers

Abstract

With increasing disposable income, rising health consciousness and image-sensitiveness, urban Indian population are in pursuit of a healthier lifestyle. Health conscious consumers seek information about the products and based on this information they include the products/services in their buying consideration set. The purpose of this study is to investigate how health consciousness is related to exploratory buying behaviour tendency like information seeking and acquisition. The empirical analysis is based on the survey conducted in the western part of India. A significant relationship was found between health consciousness dimensions and exploratory information seeking behaviour. However, the study reflected that such consumers do not acquire the products even if they seek information.

Keywords: Health consciousness, Purchasing power, Exploratory buying behaviour, Information seeking, Acquisition of product
Health is an elementary component of human life (Lee and Loke, 2005). With the rapid evolution of health-care services, individuals have become more alert, self-conscious and involved and regularly monitor their health (Gould, 1988; Gould, 1990). Interestingly, nowadays consumers prefer healthy variants of food items and take a keen interest in health-related wellness programs (Kemp et al., 2013). Extant researches on health as a variable support the notion that with growing concern towards health; demand for health-related products and services have also shown an upward trend (Leeflang and Van Raaij, 1995). This trend can be attributed to the increasing rates of obesity across the world. Owing to these attributes individuals seek alternatives that lead to a healthy lifestyle. Moreover, as customers are growing more health-conscious, food marketers, as well as health service providers, are also attempting to understand intricacies which motivate the consumer to buy; so that they can be provided preferred healthier alternatives (Hong, 2009).

Health orientation is a goal-directed stimulation which leads to engagement in preventative or proactive health behaviours (Moorman and Matulich, 1993). Health consciousness and health behaviour have always been an area of interest in social as well as health psychology. Health consciousness is an indicator of health orientation and inferred as the extent to which health is related to individuals' day-to-day regimes (Basu and Dutta, 2008; Dutta-Bergman, 2004). Health conscious individuals take on healthy behaviours and carry out preventive lifestyle. Many researchers have also studied health consciousness theories which reveal that enhancing health behaviour leads to the prevention of health-related problems. Hence, individuals prefer products that are healthy (Glanz et al., 1998; Persaud and Azhar, 2012). Such individuals also believe in a healthy lifestyle, seek information related to health issues and engage in behaviour that reflects the same (Michaelidou and Hassan, 2008).

To study the health orientation of the consumers, it becomes important to study how these consumers explore the health-related information. Information seeking behaviour begins when individuals realize that they have inadequate knowledge about their needs. Since health issues are stressful and relate to uncertainty, individuals are more likely to seek out information from various sources before making a purchase (Walsh and Volsko, 2008; Flaherty, 2016). On the other hand, studies on buying behaviour have emphasized that behaviours related to risk-taking, innovativeness, seeking variety, switching brands and seeking information are expressions of exploratory buying tendencies (Raju, 1980). Though information seeking behaviours have been studied widely in the past, only a few studies have focussed on information seeking in the context of health (Chowdhury et al., 2009).

The stated arguments make for a valid reason to study exploratory tendencies of health-related products, situations, and context which significantly affect consumer buying behavior. Exploratory buying behaviour engages the consumers and consumers make decisions based on their internal logic of subjective meaning systems. Studies related to this domain have also established that individuals who display exploratory behaviour are often engaged and are perceived to be intrinsically motivated. Few consumers seem to be directed or inclined toward intrinsic reasons and rewards (Deci and Rayn, 1985). Although for others, such behaviour is motivated externally by exciting and novel experiences as the urge to satisfy their curiosity (Berlyne, 1978; Shimp and Sharma, 1987). Based on the extensive literature review it can be concluded that no study so far has enumerated the influence of health consciousness on exploratory buying behavior; although some researchers have called for exhaustive studies investigating the associations of the exploratory buying behaviour with the other consumer behaviour and personality dimensions (Baumgartner and Steenkamp, 1996).

Health and wellness foods sector in India has reached an INR 10,352 crores market, with a growth rate of about 10% (Nielson, 2016). Size of India's health and wellness packaged food segment is expected to increase at CAGR of 13.3% by 2023. This indicates that there is an increasing number of health-conscious customers and therefore manufacturers are willing to offer fortified foods with essential incremental nutrients such as fiber, protein, calcium, vitamins and minerals. Moreover, marketers are sticking to strict guidelines on clear nutritional labeling. Considering this context, there exists a need to further study the factors which drive consumers' preference for health-related products or services (Hughner, 2007). However, there is an acknowledgment of the importance of exploratory motives in explaining the buying behaviour (Steenkamp and Baumgartner, 1992) but comparatively, scarce research has been conducted considering health-conscious consumers and their exploratory buying behaviour tendencies.

To address this gap and to enrich the existing literature base, the authors wish to perform a thorough and systematic literature review supplemented with empirical testing.
(Figure 1). Understanding this relationship will enable to establish an association of the variables health consciousness and exploratory buying behaviour tendency. This relation will further bring clarity on how being health conscious can influence the purchase behaviour. Hence, the purpose of this study is twofold. First, to understand the effect of various dimensions of health consciousness on the exploratory information seeking. Second, to understand the effect of various dimensions of health consciousness on the exploratory acquisition of the products.

**Figure-1. Proposed Conceptual Framework**

**Health Consciousness**

Health conscious individuals examine their health and are alert regarding their state of health. Health awareness as a phenomenon has been studied since the 1980s and with more environmental concerns, media exposure, retailer emphasis and political expediency this trend has increased (Bartlam, 1993). Studies have established that health-conscious individuals (Grunert and Wills, 2007) are more aware of the significance of sustaining health so as to avert diseases (Whitney and Rolfes, 2008) and are therefore more alert regarding their health regimes. Individuals with health awareness have the constructive utility of nutrition-related information (Newsom et al., 2005; Barreiro-Hurlé et al., 2010; Berning et al., 2010). Health-conscious consumers are concerned and thus, prefer healthier alternatives to products and services over their unhealthier substitutes (Cherrier, 2009). Health conscious consumers are goaded to maintain a healthy life by increasing healthy behaviors as they have more inclination towards health-related issues (Newsom et al., 2005) and hence adapt their routine activities and lifestyle accordingly (Jayanti and Burns, 1998). Researchers identify health consciousness as the degree of readiness in individuals to undertake healthy actions (Prasad et al., 2008; Lee et al., 2014).

According to Hong (2009), health consciousness is an individual’s orientation towards health and is conceptualized as self-health awareness, personal responsibility, and health motivation. Such consumers not only seek information but also relate this knowledge (Walsh and Volsko, 2008). Further, individuals who are found to be health-conscious discuss health-related issues and take preventive measures (Iverson and Kraft, 2006; Michaelidou and Hassan, 2008). Dutta and Bergman (2004) identified that health consciousness is an intrinsic health motivator, which drives health-related behaviours. Studies have also shown that health consciousness has an impact on the health-related attitudes and behaviours (Iversen and Kraft, 2006); consequently, consumers choose and devour products, which enable them to maintain good health (Mick and Demoss, 1990). Consumers with health-conscious behaviour prefer healthy versions of products across numerous categories (Chen, 2009). Bower et al. (2003) also pointed out that health consciousness influences individuals’ willingness to pay higher for healthy products and this notion supports the approach followed by product and service providers who are keen on devising healthy product strategies and willing to reposition their product lines as “healthier alternatives” (Golan et al., 2001; Dawson et al., 2008).

Wellbeing tendency of individuals has a positive influence on health consciousness (Kraft and Goodell, 1993). Health conscious individuals are quick to respond to health hazards
Exploratory buying behaviour also engages consumers to make decisions based on psychological parameters and explorative behaviour is also found to be predisposed by feelings (Steenkamp and Burgees, 1992; Roehm and Roehm, 2005). Consumer researchers have recognized the importance of risk-taking, innovative purchase behaviour, variety seeking, brand switching, search for information and interpersonal communication to be indicators of exploratory tendencies (Raju, 1980). Consumers seek variety to break the monotony, and intensity to break routine varies according to the exploratory tendency. According to a study carried by Grande (2005) exploratory tendency, variety seeking and stimulation level all are interrelated. Exploratory tendencies of consumers correspond to curiosity, that is the desire to find out the intrinsic reason for purchase; boredom, that is repeat buying which then resorts to variety seeking; attribute satiation that is stimulus which leads to a tendency to explore novel products (Raju, 1980; Steenkamp and Baumgartner, 1992).

Exploratory behavior includes innovativeness (Foxall, 1986), the quest for diversity (Van Trijp and Steenkamp, 1992), cognitive response to advertisements and inquisitiveness of product information (Hirschman, 1981). Exploratory buying behavior tendency is a personal trait and is an indicator of individual's disposition engagement which includes the exploratory acquisition of products and exploratory information seeking (Baumgartner and Steenkamp, 1996; Waheed and Jianhua, 2018). Acquisition of products is a trait of individuals to look out for sensory stimulation while making a purchase for innovative categories which involves risk through varied consumption experiences. Exploratory information seeking involves the tendency to acquire cognitive stimulation through the acquisition of consumption-related knowledge which can be curiosity-driven and leads to the purchase (Hirschman, 1981). Studies have found that individuals who show high exploratory acquisition seek variety and buy unfamiliar and innovative products; while individuals with high information-seeking tendency browse and do window shopping, and are more interested in discussing their consumption experiences.

A greater preference for specific products constrains the realization of exploratory behaviour by consumers (Van Trijp et al., 1996). Such preference could be attributed to individuals' inclination towards perceived cost/benefit relationship for the products. Increase in health risk sensitivity reflects an increase in ambiguity related to health (Johnson and Slovic, 1995; Burgess et al., 2009; Bond and...
from health-conscious segments not only for designing specific product or services but also for formulating appropriate marketing decisions for categories related to health.

**Health Consciousness and Exploratory Buying Behaviour Tendency**

From the above discussion, it can be inferred that health consciousness serves as an enabler which leads to health information seeking behavior (Ahadzadeh et al., 2015). Consumers are found to seek nutrition-related information of the advertisements related to food items (Burton et al., 2009). Such health-related information may be sought from passive sources which include TV shows, radio programs, books, newspapers, magazines, advertising and pamphlets (Moorman and Matulich, 1993; Dutta-Bergman, 2004). Individuals are progressively becoming more dependent on the internet as a means of obtaining pertinent information which is basically important in decision making regarding health issues (Laurent and Vickers, 2009; Jacobset al., 2017). Interpersonal communication supplements the information further which affects the individual’s health consciousness and search related to healthy products.

Therefore the research proposes that health self-consciousness, alertness related to health matters, involvement and monitoring of an individual’s health leads to exploratory information seeking behavior. Based on these the following hypotheses are formulated:

**Hypothesis One:** Consumers’ a) health self-consciousness, b) health alertness c) health involvement and d) health self-monitoring positively affect their exploratory information seeking behavior.

There is an increased understanding amongst the Indian consumers that their physical activities and eating habits affect their longevity. Health consciousness leads to active engagement of healthy behaviors as well as innovative purchase behavior. Individuals who are cautious about their health tend to be vigilant about their health parameters at all time, and this tendency leads them to adopt a healthier lifestyle. Consequently, it is also recognized that individuals who are more health conscious are focused regarding their consumption patterns (Schafer et al., 1993; Iversen and Kraft, 2006). Consumers with strong health conviction as well as the commitment for healthier activities have specific purchase intentions and are ready to pay more for products which have established health benefits (Bower et al., 2003). Hence, health-conscious consumers search products with health attributes and claims which are more appealing. Moreover, for such consumers, the mere availability of healthier food options leads them to make a purchase (Wilcox, 2009).

Therefore the present study proposes that health self-consciousness, alertness related to health matters, involvement and monitoring of an individual’s health also leads to the exploratory acquisition of the products by the individuals. Based on these the following hypotheses are formulated:

**Hypothesis Two:** Consumers’ a) health self-consciousness, b) health alertness c) health involvement and d) health self-monitoring positively affect their exploratory acquisition of the product.

**Research Methodology**

**Sample and Data collection**

The relationship between overall health consciousness and exploratory buying behaviour tendency as shown in the conceptual framework of this research was tested. In the overall framework, HI, HA, HCSC and HSM were proposed as the precursors of EIS and EAP. The testing ground in this research work was young consumers.

The sampling unit comprised of undergraduate, graduate and post-graduate from the western zone of India. First few young consumers were asked to fill the questionnaire and then they were requested to introduce or suggest their young friends/relatives. We administered questionnaires to respondents via face-to-face meetings. Total, 345 responses were collected from the young consumers, out of which 6 responses were eliminated due to missing values/low standard deviation in the questionnaire. Total 339 responses found usable were taken into consideration for the analysis.

Out of the total 339 usable responses, 54% were males and the remaining 46% of respondents were females. Around 31%, 30% and 39% of the respondents were undergraduate graduates and postgraduate respectively. The average age of the respondents was found to be 23 years.

**Measurement**

The measures used in the present study have been taken considering past literature. A five-point multi-item Likert scale has been used to measure the variables except for one control variable (i.e.) education. HI, HA and HSM were measured with two item scales and HCSC was measured with three item scales adapted from Gould (1988). To
measure the exploratory buying behaviour tendency factors. EIS and EAP; ten item scales for each variable were adapted from Baumgartner and Steenkamp (1996). Exploratory buying behaviour tendency amongst young consumers can also be influenced by another variable like the level of education which is not considered in the research model. Education is a vital attribute that influences the young consumers' attitude toward buying health products. We have kept this factor as a control variable for this study.

Findings

Structural Equation Modelling (SEM) is widely accepted for understanding and explaining the association between the constructs. This is done by finding the correlation between directly measured variables in two stages approach. First, the measurement model is used for measuring the reliability and validity through confirmatory factor analysis (CFA). Second, the structural model is used for measuring the relationship between the constructs through structured equation modelling (SEM).

Measurement model results:

HA, HI, HCSC, HSM, EAP and EIS are used as latent variables. We have considered the followings measures for this study: two measured variables (HA1 and HA2) of health alertness, two measured variables (HI1 and HI2) of health involvement, three measured variables (HCSC1, HCSC2 and HCSC3) of self-health consciousness, two measured variables (HSM1 and HSM2) of self-health monitoring, ten measured variables (EAP1, EAP2, EAP3, EAP4, EAP5, EAP6, EAP7, EAP8, EAP9 and EAP10) of exploratory acquisition of product and ten measured variables (EIS1, EIS2, EIS3, EIS4, EIS5, EIS6, EIS7, EIS8, EIS9 and EIS10) of exploratory information seeking.

The results of CFA show the validity of the collected data through 27 measured variables that represent six latent constructs. Due to low factor loading values, 1 item each from EIS and EAP was dropped (Refer table 1). We observed normal distributions and skewness for all our indicators of latent variables. Although we observed high kurtosis value for one of the independent variable (health alertness) is 0.97, still it is within the range of -1 to 1. (Sposito et al., 1983; Gravetter and Wallnau, 2014). We also computed the overall impact of health-consciousness on exploratory buying behaviour tendency and found that overall health-consciousness has a significant and positive impact on EIS and it has a significant and negative impact on EAP.

For the reliability, the construct-wise Cronbach's alpha values and factor loading values were calculated and are shown in Table 1. Cronbach's alpha and factor loading for all the constructs was found to be greater than 0.7 (Hair et al., 2010).

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Factor Loadings</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health alertness (HA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HA1</td>
<td>0.699</td>
<td>0.712</td>
</tr>
<tr>
<td>HA2</td>
<td>0.744</td>
<td></td>
</tr>
<tr>
<td>Health involvement (HI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HI1</td>
<td>0.776</td>
<td>0.754</td>
</tr>
<tr>
<td>HI2</td>
<td>0.782</td>
<td></td>
</tr>
<tr>
<td>Self-health consciousness (HCSC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCSC1</td>
<td>0.790</td>
<td>0.815</td>
</tr>
<tr>
<td>HCSC2</td>
<td>0.822</td>
<td></td>
</tr>
<tr>
<td>HCSC3</td>
<td>0.705</td>
<td></td>
</tr>
<tr>
<td>Self-health monitoring (HSM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSM1</td>
<td>0.849</td>
<td>0.850</td>
</tr>
<tr>
<td>HSM2</td>
<td>0.872</td>
<td></td>
</tr>
</tbody>
</table>
Various measures are used for assessing the validities of six constructs that are used in current research. The AVE for all constructs ranges between 0.58 to 0.84. Composite reliability (CR) of all six constructs were ranging from 0.70 to 0.93, which is higher than 0.7 (Malhotra and Dash, 2011). For discriminant validity, the square root of AVE of each construct was greater than the correlations between constructs (ref. Table-2) (Hair et al., 2006). According to CFA, the measurement model \((\chi^2 = 727.702, df = 307, p = 0.000)\) is acceptable and shows fitness of the model as CFI = 0.923, TLI = 0.913, RMSEA = 0.064. We can conclude that the measurement properties of the proposed framework show acceptable model fit, validity and reliability.

**Structural model results**

The structural model is useful for hypothesis testing between unobserved variables. The structural model is presented in Figure 2.

### Table -2. Descriptive statistics and correlations matrix

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA</td>
<td>4.177</td>
<td>0.670</td>
<td>0.721</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HI</td>
<td>3.536</td>
<td>0.887</td>
<td>0.510</td>
<td>0.779</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCSC</td>
<td>3.906</td>
<td>0.824</td>
<td>0.395</td>
<td>0.622</td>
<td>0.773</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSM</td>
<td>3.944</td>
<td>0.820</td>
<td>0.485</td>
<td>0.474</td>
<td>0.414</td>
<td>0.860</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAP</td>
<td>3.640</td>
<td>0.958</td>
<td>-0.086</td>
<td>-0.154</td>
<td>-0.135</td>
<td>-0.109</td>
<td>0.792</td>
<td></td>
</tr>
<tr>
<td>EIS</td>
<td>3.235</td>
<td>0.904</td>
<td>0.053</td>
<td>0.176</td>
<td>0.073</td>
<td>0.156</td>
<td>-0.089</td>
<td>0.741</td>
</tr>
<tr>
<td>AVE</td>
<td>0.521</td>
<td>0.606</td>
<td>0.598</td>
<td>0.740</td>
<td>0.627</td>
<td>0.549</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>0.70</td>
<td>0.755</td>
<td>0.816</td>
<td>0.850</td>
<td>0.937</td>
<td>0.916</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In the structural model, HCSC, HA, HI and HSM are the independent constructs, and they have an impact on two dependent constructs which are EIS and EAP. Therefore, the four independent constructs have a direct effect on change in EAP and EIS. The direct effects of independent variables are as follows: HCSC ($\beta = 0.315$, p=0.096 < 0.1) has a positive and significant impact on EIS, supporting H1 (a). HA ($\beta = 0.457$, p=0.05 < 0.1) has a positive and significant impact on EIS, supporting H1 (b). HI ($\beta = 0.590$, p=0.015 < 0.05) has a positive and significant impact on EIS, supporting H1 (c) and HSM ($\beta = 0.195$, p=0.076 < 0.1) has a positive and significant impact on EIS, supporting H1 (d).

HCSC has positive and insignificant impact on EAP ($\beta = 0.019$, p= 0.922 > 0.1), thus it is not supporting H2(a), HA has a positive and insignificant impact on EAP ($\beta = 0.134$, p=0.565 > 0.1), thus it is not supporting H2(b), HI has a negative and insignificant impact on EAP ($\beta = -0.305$, p=0.201 > 0.1), thus it is not supporting H2(c), HSM has a negative and insignificant impact on EAP ($\beta = -0.030$, p=0.791 > 0.1), thus it is not supporting H2(d). Overall, Model ($\chi^2 = 662.471$ df = 307, p = 0.000) generates good result with respect to model fit ($\chi^2/df = 2.157$, CFI = 0.935, TLI=0.925, NFI = 0.886, RMSEA = 0.059).

**Discussion And Conclusion**

The results of this study have shown that respondents who are health self-conscious show exploratory information seeking behaviour. Health conscious individuals explore more information about the products and services. Consumers who value health-conscious lifestyles and dietary patterns choose products after seeking health and nutrition information. Various other researchers also established that consumers who have health-conscious lifestyles value the products which are related to health benefits and are of high relevance (Darlow et al., 2012). Moreover, individuals who have high self-consciousness are also concerned about self-presentation and have intentions to eat healthy foods. Responsiveness about the natural and organic products has recently increased in India and there is an expectation for germane products and services by the consumers; hence enormous chances are created for the marketers to offer lucrative products (Sunet al., 2009).

The present study also reflected that involvement contributes to in-depth information processing. This was supported by the study carried by Mesanovic et al. (2013) which emphasized that health-conscious individuals tend to be implicated with their health which makes them search for and use health-related information. Past studies have reported that individuals' who are involved with health discuss their health matters with their friends and relatives (Aldoory, 2001). Iversen and Kraft (2006) argued that apart from seeking health information such consumers tend to make recommendations to others (Grunert and Wills, 2007; Van Der Merwe et al., 2010).

Self-monitoring is the systematic observation and recording of target behaviour, it has also been described as the most effective technique for weight loss (Kanfer, 1970). Self-monitoring helps in increasing individuals' self-awareness and thereby positively affects the eating and exercise
behaviours (Heesche et al., 2003). The result of this study has also reflected that health self-monitoring behaviour leads to exploratory information seeking tendency. Few studies have also found that with an increased attention given to self-monitoring and care there is an increase in the health-related information seeking (Loiselle and Dubois, 2003). Individuals who engage in self-monitoring behaviour consider even the meagrest of health issues as threatening situations and therefore become more engaged while searching information (Shiloh et al., 1999).

Information seeking makes individuals understand the threat and associated challenges of health hazards (Clark, 2005) and this further helps them to evaluate what is at stake so as to enable them to make more informed decisions. There is an evident increase in enrolments in gyms, meditation and yoga centers, dance classes and other fitness related institutes in India. This is so because Indian consumers are now more exposed to social media and other digital platform and they access information related to health and try to imitate their peers. This exposure has not just made them aware of health-related information but has also led them to consult health-doctors, dieticians and nutritionists (Flattery et al., 2005; Geana and Greiner, 2011).

On the other hand, this study has revealed that there is no significant relationship between health self-consciousness, health alertness, health involvement and health self-monitoring with exploratory acquisition behaviour. This could be attributed to the fact that though the respondents explore the information related to health they do not always acquire such products. Steenkamp and Baumgartner (1992) in their study have suggested that consumer information seeking is influenced either by the need to make superior purchase decisions or by their casual interest for learning more. In the case of the former situation, information acquisition acts as a means to some extent, while in the latter case it is believed to be inherently motivated, which can be curiosity-driven. Consumers purchase intentions also differ if they have varying level of knowledge (Chiou, 1998) and skepticism toward health claims negatively affects the purchase intention of healthy products (Bower et al., 2003).

The consumers need rational support for making purchases and certain ill confident consumers are not inclined to make purchases (Vermeir and Verbeke, 2008). A study carried by Gould (1988) found that individuals with high health consciousness go more regularly for health checkups on preventive or monitoring basis but this behaviour varies with demographics. Younger consumers hold more positive attitude towards organic food but don't make purchases, whereas older consumers have more disposable income hence they can afford foods with health-related benefits Magnusson et al. 2001. Similarly, another research indicated that more than 50 percent consumers who were interested in purchasing “earth-sustainable” foods, did not purchase such foods owing to the perceived barriers like lack of availability, inconvenience, price, habit and trust (Robinson and Smith, 2002: Zanoli and Naspetti, 2002 Tarkiainen and Sundqvist, 2005).

Studies have found that consumers who associate with health benefits (health preservation, health improvement) and health-related products have little to no direct influence on motivation to make a purchase. Such behavior could be because of lack of appropriate promotion or retailing efforts by the marketers. (Michaelidou and Hassan, 2008). Researchers have also emphasized that self-monitoring behaviour negates the impulsive buying tendencies in consumers. Such consumers seek more variety before making purchases. According to Prasad and Aryasri (2009), individuals decisions regarding healthy or unhealthy category is based on a combination of two effects. One of these effects is based on the health consciousness which is a trait and second is based on the consumer's intrinsic preference. Moreover, consumers with high involvement seek a larger number of choice alternatives before making a purchase and think more and respond differently to persuasive communication. Since ample choice is not offered in health-related products, many consumers may not acquire such products. Therefore, it is essential that health information needs to be communicated judicially so that involvement can lead to purchase.

According to PwC-FICCI report of 2012 on evolving Indian consumers, health and wellness have seen a transition from being just a platform targeting a selected few to a concept applicable to the mainstream. However, the report also states that price determines the purchase pattern especially in Tier 2 and Tier 3 cities. The report further categorized the consumers based on the importance they give to their wellness as passives, beginners, actives and believers. Passives include more than 700 million people who are not ready to adapt their lifestyle or taste and are not ardent health information seekers unless needed owing to any medical condition. However, beginners constitute 150-200 million individuals who are more willing to experiment and take steps towards preventive care while actives comprise of 15-25 million individuals who not only pursue health-related information but are also ready to shell out a premium for high-quality products and services. Believers which
comprise only 1-2 million Indian populations are the early adopters and opinion leaders who show great awareness and interest in wellness related to global health trends and further look out for solutions. Such consumers are predisposed to products and services with differentiated functional benefits.

Managerial Implications

As consumers are becoming health conscious there is a need to improve the foundation on which many professions related to goods and services marketing are based. These products and services can range from air cleaning systems to staples like milk. More importantly, the present research has brought together two different kinds of literature, exploratory behaviour and health consciousness and shown an association between them. Pieces of evidence support earlier studies, which concluded that health-consciousness is a precursor of exploratory buying behaviour (Ahadzadeh et al., 2015). Overall health consciousness has shown a positive impact on information seeking. This indicates that health-conscious consumers seek information about the products and based on this information they include the related products in their consideration set. On the other side, overall health consciousness has shown a negative impact on the acquisition of products. This empirical evidence fails to support the existing research of Bower et al. (2003) that suggested, health-conscious consumer, buy the products which have more health benefits. The potential reasons for not acquiring the products even though the information about the products is sought could be price, availability, product range, taste and improper marketing communication. Products with high health benefits are often costlier than the other conventional or counterfeit products and since the purchasing power of the consumer is less in the developing countries like India rather than developed countries, consumers may not be in a position to acquire them. It is suggested that marketers offer affordable healthy variants of the products and services.

As the number of health-oriented customers is increasing in the Indian market, it is crucial for the marketers to classify customers on the basis of the amount and nature of information search done by them. This would help the marketers to categorize and distinguish the attitudes of consumers towards purchasing of health-conscious products before formulating marketing – mix strategies. Many studies have discussed the digital divide in using the internet as a channel of accessing information (Geana and Greiner, 20131). Hence it could be implied that marketers must be very careful while choosing their segmentation and positioning strategies because health positioning reaches health-oriented consumers through various media which includes print, audio, audio-visual as well as social. The information should be provided not only in a convincing but authentic manner so that consumers can retrieve it while making decisions. Further, health-oriented firms should also focus on specific promotion tools like in-store promotion which are important for consumers during actual purchases. As the marketplace for healthy products is becoming competitive, health-conscious customers are becoming the focal point of marking strategy. Therefore marketers need to develop effective and creative advertising strategies which must help health-conscious consumers to comprehend and apply the information in enhanced fashion (Loueiro and Kaufmann, 2017; Persaud and Azhar, 2012). It is also essential to design messages that are not only persuasive and influencing but also aid consumer recall.

Marketers can also lure the health conscious users (as opinion leaders) who recommend health products and services to potential health-conscious consumers. This would build favourable opinion as vicarious reinforcing (where an individual observes the outcomes of another person's action) may lead to purchasing. The consumer should be motivated (through effective campaigns) to read health-related information on the labels while making a purchase that might influence subsequent behaviour (Grunert and Wills, 2007). As consumers of various demographic profiles have become cautious marketers need to use effective techniques which not only facilitate, satisfy and stimulate but reinforce the desired buying behaviour (Thaler and Tucker, 2013). Startups can also focus on using health as a bait to target young consumers leading a hectic lifestyle. For example, by offering breakfast bars and other healthier snack variants which will help them to vie market share from grocery retailers and manufacturers. On the other hand, public health policymakers should be vigilant towards the health-related claims made by the manufacturers' thereby building positive attitudes in the near future.

Limitations And Avenues For Future Research

The limitations of this study can provide several avenues for future research. It was quite difficult to describe exactly what is accepted as healthy by health-conscious consumers and it was beyond the scope of the present work. Future research can include other relevant definitions and descriptions with respect to exploratory buying behaviour and its dimensions. The testing unit in the study included consumers in their early twenties from the western region of
India. Therefore to generalize on a larger and heterogeneous sample is advisable. There is another possibility for potential research on different testing units like consumers in various age groups and income levels. Future research can be conducted to examine the conceptual framework with the help of moderators like income, age, profession, marital status and gender. A study can be carried for examining exploratory buying behaviour of health consciousness based on specific products and services. Future studies can be done considering other parameters such as culture, knowledge, materialism and personality traits which affect consumption pattern.

Reference


Studying human personality dimensions has interested scholars for decades. However, associating these traits with brands was under-researched. Aaker’s remarkable paper, “Dimensions of brand personality,” rekindled researcher’s interest. Many authors adopted her proposed theoretical model, and few challenged her findings. Last two decades saw a surge in publications. Different areas of research emerged, and several advocated new brand personality scales. Branding literature has no such compilation and analysis of these dimensions. Enough articles are there to undertake an analysis of the different dimensions. This paper reviews dimensions of brand personality based on an online database of articles. Paper collates the different dimensions of brand personality. Summarising these dimensions the article outlines an agenda for future research.

**Keywords:** Brand personality, Dimensions, Development, Bibliometric review, Jennifer Aaker
Last two decades saw Brand Personality gain prominence in marketing and academic literature. Articles in many journals stand testimony of the growing importance of brand personality. Brand personality is an essential tool for building brand image. It supports consumer's decision-making. Hence, the importance of brand personality is there in marketing studies. Martineau, (1958) states brand as an image in the consumer's minds with functional and psychological attributes. Products are physical entities living in the real world. Brands are a perceptual entity that lives in the consumer's mind. Empirical study findings measuring brand personality played an essential role in brand positioning. Brand characterisation differentiates competing brands just as personalities of human beings differentiate them. Personality traits manifest from an individual's behaviour, attitudes, beliefs, and demographic characteristics (Rothbart and Park, 1986).

Extensive research on personality psychology helped in conceptualising and identifying human personality dimensions. Scholars studied, probed, and explored these human personality dimensions. But, parallel research in consumer behaviour on brand personality was insignificant. Brand and human personality may have similar conceptualisations, but the two are different constructs. McCracken's (1989) suggested, “Personality traits associated with users of the product or brand are transferred to the product or brand.” Thus, people consume products or brands those symbolise or communicate these characteristics. Aaker, 1997 based her definition on this premise. Her transformational study filled this void. She rejuvenated scholar's interest in brand personality. She defined brand personality as, “the set of human characteristics associated with the brand”. Azoulay and Kapferer, (2003) found the definition to be broad and vague. They argued that it includes non-product related attributes in the definition may be from earlier studies. Thus, Aaker's definition includes concepts outside the realm of brand personality. Churchill suggested that the definition should set the boundary of what is included in and excluded from the concept. In research studies, there is disagreement on the definition and the proposed definitions by few authors are listed in table 1 below.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoulay and Kapferer (2003)</td>
<td><em>Brand personality is the set of human personality traits that are both applicable to and relevant for brands.</em></td>
</tr>
<tr>
<td>Ramaseshan and Tsao (2007)</td>
<td><em>Brand personality as the soul of a brand that originates from the brand’s characteristics and marketing communications.</em></td>
</tr>
<tr>
<td>Solomon (2013)</td>
<td><em>Brand personality is a set of character traits that people can associate with a brand in a similar manner to humans.</em></td>
</tr>
<tr>
<td>Huang, Mitchell and Rosenaum-Elliott (2012)</td>
<td><em>Brand personality is a metaphor that refers to the description of a brand as a human being.</em></td>
</tr>
</tbody>
</table>

Literature Review:
In studies on brand personality before 1997, the authors have adopted ad hoc sales comprising 20 to 300 traits (Aaker, 1997). These scales developed for specific studies had useful findings. Chances of omission of some important traits are possible. An alternate approach to brand personality was to rely on human personality scales. Different approaches in research to study brand personality include human personality scales developed by psychologists. Data from existing literature also assists in scale development. Researchers asked respondents to think of a brand as a person and then describe the personality traits. Authors often adopt this approach in scale development. They seek experts help for a review of the list of traits generated. This list is followed by factor analysis to extract explainable and straightforward factors. Factor rotation simplifies understanding, and interpretation of factors. It improves the reliability of factors. Table 2 states the rotation method adopted by different authors.
Scholars adopted various techniques like qualitative methods, experiments, and surveys to capture data. The sampling method used included convenience, student, representative, online panels, consumer and expert samples. Data analysis involves simple t-tests, to correlation, and regression EFA, CFA and ANOVA.

Ramaseshan and Tsao, (2007) mentioned, “There had been, however, no formal measure of brand personality until Aaker developed a formal brand personality scale (BPS).” Aaker, (1997) study suggested sincerity, competence, sophistication, excitement, and ruggedness as brand personality dimensions. The frame proposed by Aaker inspired scholars to research brand personality. This led to an increase in studies on brand personality and a surge in the publication. Authors questioned Aaker’s findings. Some authors questioned the conceptual definition, method, and dimensions in Aaker's scale. Few scholars validated Aaker's scale translating the dimensions in the local language. Other scholars changed and added a few countries-specific dimensions. They then test these dimensions for translation adequacy and scale robustness. Brand personality had existed over two decades. Scholar's due attention was missing and hence remained dormant until 1997. Data revealed that between the year 1970 and 2009 published papers are only 743 (Google Scholar). The number of published papers is over a thousand in the eight following years. This shows researchers interest, and the increased acceptance of the brand personality.

Dodoo, (2017) used the “Facebook” brands to examine the role of aspirational brand personality on consumers. Results showed that the virtual identity influenced self-representation and belonging motivations of consumers. Findings corroborate application of brand personality in self-presentation. Brand personality played a significant role in communication crisis. Han, Sung, and Kim, (2017) used content analysis for communication crisis of an organisation. They found sincere brands to be active in crisis management. Exciting brands were passive in addressing communication crisis management. Besides communication crisis, self-representation, there are many studies on the brand personality dimensions with the various application. Brand personality studies covered rocks, sunglasses, umbrella, design symmetry, and university websites. Mentioned below in table 3 are areas researched to examine the brand personality dimensions.
The table above shows the wide application of brand personality to a variety of products, services, and experiences. New brand personality scales and dimensions emerged. What is clear is the lack of investigation on different dimensions of brand personality? Such an investigation is essential to understand the different personality dimensions emerging from several scales.

**Key objectives of this paper are:**

- Compilation of dimensions of brand personality proposed by authors,
- To analyse and summarise these dimensions and
- To find the article ranking and their citations.

For this study, the authors extracted the data from Google Scholar using a title word as “Brand Personality”. The result was over an 1800-paper publication from 1970 until date. Over a 1000 published articles after 2009, shows the significance. Brand Personality research gained momentum after Aaker proposed framework. Thus in the study articles reviewed on brand personality dimensions are post-Aaker.

Authors reviewed the title, keywords, abstract to look for articles, and selected relevant papers. The papers selected for the studies were the ones, which developed a new scale or tested the Aaker scale with modifications in different regions. The study covered a diverse range of products where dimensions of Band Personality were changed or alternate dimensions were proposed. This paper synthesises the different dimensions that exist in the body of literature on Brand Personality.

Kumar A. (2018) was a critic of Aaker's findings. He identified definition, dimension, method, concept, and generalisation as fallacies. Whereas Das, Guin, and Datta, (2012) reviewed seven select author's work. The study found sample size, sampling technique, and respondents profile as drawbacks. However, Radler V, 2017 study, “20 Years of Brand Personality,” grouped studies in five categories.

a) Conceptualisation, operationalisation and cultural issue,
b) Direct and indirect effects of brand personality,
c) Dynamics of brand personality dimensions,
d) Brand personality in brand extensions, and
e) Application of brand personality to related areas.

These studies centred on the shortcoming of previous findings. Whereas Radler, (2017) clustered the results of different articles.

Davies et al., (2018) paper on the brand personality focused on human perception theory. They re-examined their database (Davies, Chun, Da Silva, and Roper, 2004). Scrutiny including existed (Rojas-Méndez, Papadopoulos, and Murphy, 2013b) and fresh data sets. The oblique rotation had sincerity and competence as standard measures for most studies. They found status in few studies. The study endorsed the previous findings.

Ambroise, Ferrandi, Merunka, and Vallette-Florence, (2005) developed a new brand personality scale for France. Competing consumer brands had natural, mature, exciting, and mischievous as common traits. Other traits found were reliable, glamorous, secure, rigorous, cheerful, elegant, sweet, and outgoing. These traits varied with the brand Heine K. (2009) researched on luxury goods, in Germany. They suggested modernity, opulence, eccentricity, elitism, and strength as brand personality dimensions. Kuenzel, and Phairor (2009) study came out with a different short scale. Their study of German automobile brand showed security and passion as dimensions. The scale reduced respondent fatigue, compared to other scales. Leonard and Prevel Katsanis (2013) analysed the prescription drugs personality. They interacted with individuals above the age of 35 years. Competence and innovativeness are the two distinct brand personality dimensions for prescription drugs. Badgaiyan, Dixit, and Verma (2017) explored consumer impulsive buying behaviour and brand personality. In Indian context responsibility, simplicity, emotionality, activity, and aggressiveness are brand personality dimensions. Activity and aggressiveness influence impulsiveness in consumer buying behaviour. The other personality dimensions had no influence on impulsive buying. Their study validated (Geuens et al., 2009) proposed dimensions. These scholars proposed different dimensions for different regions.

Schade, Piehler, and Burmann (2014) developed “sports club” brand personality scale. Their multi-stage study approached 2994 German respondents. Extraversion, rebellious, open-mindedness, and conscientiousness emerged as the “sports club” brand personality dimensions. These findings apply to the club and not any sport. Stadler Blank, Koenigstorfer, and Baumgartner (2018) found success, talent, entertainment, dedication, admiration, and care as brand personality dimensions. The781 respondents were fans of national sports league such as football, baseball, basketball, and hockey from the USA and the UK. They used respondents as the unit of analysis, unlike (Aaker, 1997) to replicate the STPS across different contexts and
cultures. In another study (Lee and Cho, 2012) borrowed traits from previous studies. They analysed four sporting events in the USA. The proposed brand personality dimensions were diligence, fit, tradition, amusement, and uninhibitedness. These studies centred on sporting events but proposed different scales. These results show the diversity of dimensions among scholars for sports-related dimensions.

Adopting Aaker's dimensions (Chu and Sung, 2011) experimented with many products in China. Competence, excitement, and sophistication were valid for China. Other cultural specific dimensions that emerged were traditionalism, joyfulness, and trendiness. Sweeney and Brandon (2006) used the circumplex model. They adopted dimensions from the five-factor model and Aaker's brand personality dimensions. Their results accepted dimensions proposed by Aaker (1997) and suggested three more dimensions. These dimensions were agreeableness, extroversion, and conscientiousness from human personality. Few scholars added or modified dimensions of Aaker scale.

Table 4 below gives the tabulation of few studies. It covers the region of study; the brands examined along with the proposed dimensions.

Table: 4 Brand personality studies on scale development.

<table>
<thead>
<tr>
<th>Author(Year)</th>
<th>Country</th>
<th>Brands</th>
<th>Brand Personality Scale Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caprara et al. (2001)</td>
<td>Italy</td>
<td>Consumer Brands</td>
<td>Agreeableness, Emotional stability, Extraversion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Openness to experience, Unpleasant, Solidity, Genuineness, Sophistication,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enthusiasm</td>
</tr>
<tr>
<td>D'Astous and Lévesque,</td>
<td>Canada</td>
<td>Store Personality</td>
<td>Sincerity, Successful, Excitement, Sophistication, Ruggedness</td>
</tr>
<tr>
<td>(2003)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supphellen and Grønhaug</td>
<td>Russia</td>
<td>Multiple</td>
<td></td>
</tr>
<tr>
<td>(2003)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helgeson and Supphellen</td>
<td>Sweden</td>
<td>Women Clothing</td>
<td>Modern, Classic</td>
</tr>
<tr>
<td>(2004)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Davies et al. (2004)</td>
<td>UK</td>
<td>Corporation</td>
<td>Agreeableness, Enterprise, Competence, Chic, Ruthlessness, Informality,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Machismo</td>
</tr>
<tr>
<td>Sung and Tinkham(2005)</td>
<td>US/Korea</td>
<td>Consumer Brands</td>
<td>Competence, Trendiness, Western, Likeableness, Sophistication, Ruggedness,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tradition, Ascendancy</td>
</tr>
<tr>
<td>Venable, Rose, Bush, and</td>
<td>US</td>
<td>NPO</td>
<td>Sincerity, Integrity, Nurturance, Sophistication, Ruggedness</td>
</tr>
<tr>
<td>Gilbert (2005)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ekinci and Hosany (2006)</td>
<td>UK</td>
<td>Tourism Destination</td>
<td>Sincerity, Excitement, Conviviality</td>
</tr>
<tr>
<td>Smith, Graetz, and</td>
<td>Australia</td>
<td>Sports Club Membership</td>
<td>Sincerity, Competence, Excitement, Sophistication, Innovation</td>
</tr>
<tr>
<td>Westerbeek, (2006)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Location</td>
<td>Category</td>
<td>Traits</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------</td>
<td>---------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Bosnjak et al. (2007)</td>
<td>Germany</td>
<td>Multiple</td>
<td>Sincerity, Competence, Excitement, Drive, Conscientiousness, Emotion, Superficiality</td>
</tr>
<tr>
<td>Murphy, Moscardo, and Benckendorff, (2007)</td>
<td>Australia</td>
<td>Destination Two</td>
<td>Upper class, Honest, Exciting, Tough, Sincere, Sophisticated, Outdoorsy</td>
</tr>
<tr>
<td>Grohmann (2009)</td>
<td>US</td>
<td>Gender/Multiple brands</td>
<td>Masculine Traits: Adventurous, Brave, Aggressive, Daring, Dominant, Sturdy,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Feminine Traits: Expressive, Graceful, Fragile, Sensitive, Sweet, Tender</td>
</tr>
<tr>
<td>Smith (2009)</td>
<td>Britain</td>
<td>Politics Context</td>
<td>Honesty, Leadership, Image, Spirited, Toughness, Uniqueness</td>
</tr>
<tr>
<td>Geuens et al. (2009)</td>
<td>Belgium</td>
<td>Multiple</td>
<td>Sincerity, Activity, Responsibility, Aggressiveness, Simplicity, Emotionality</td>
</tr>
<tr>
<td>Freling, Crosno, and Henard, (2010)</td>
<td>France</td>
<td>BP Appeal</td>
<td>Favourability, Originality, Clarity</td>
</tr>
<tr>
<td>Sung and Park (2011)</td>
<td>US</td>
<td>Cable Network</td>
<td>Intelligence, Warmness, Excitement, Controversy, Ruggedness</td>
</tr>
<tr>
<td>Romero et al.,(2012)</td>
<td>Mexico</td>
<td>Multiple Products (FCB Grid)</td>
<td>Sincerity, Success, Professionalism, Sophistication, Ruggedness, Hipness,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vivacity, Domesticity</td>
</tr>
<tr>
<td>Huang et al., ( 2012)</td>
<td>England</td>
<td>Multiple</td>
<td>Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness</td>
</tr>
<tr>
<td>Tsiotsou (2012)</td>
<td>Greece</td>
<td>Sports Team</td>
<td>Competitiveness, Prestige, Morality, Authenticity, Credibility</td>
</tr>
</tbody>
</table>
Ambroise and Valette-Florence (2010)  France  Multiple  Introversion, Agreeableness, Conscientiousness, Sophistication, Disingenuousness
Herbst and Merz (2011)  Germany  Industrial Products  Performance, Sensation, Credibility
Valette-Florence and De Barnier (2013)  France  Print media (Newspaper/Magazine)  Respectability, Disingenuous, Conviviality, Assertiveness, Charm
Ham and Lee (2015)  US  Internet Media  Intelligent, Amusing, Convenient, Sociable, Confusing
Tsaur, et al. (2016)  Taiwan  Destination  Friendly, Reliable, Glamorous
Ahmad and Thyagaraj, (2017)  India  12 Global and 6 Indian  Sophistication, Excitement, Popularity, Competence, Trendiness, Integrity
Pan et al. (2017)  China  Tourism Destination  Competence, Sacredness, Vibrancy, Femininity, Excitement

Findings:
Articles reviewed were from various countries researched for different brands, products, or services. The results based on the analysis of the data shows citations, paper ranking, and the publisher in the following table 5.

<table>
<thead>
<tr>
<th>Citations</th>
<th>Authors</th>
<th>GS rank</th>
<th>Title</th>
<th>Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>8925</td>
<td>Aaker J (1997)</td>
<td>1</td>
<td>Dimensions of brand personality</td>
<td>JSTOR</td>
</tr>
<tr>
<td>1217</td>
<td>Aaker, et al. (2001)</td>
<td>4</td>
<td>Consumption symbols as carriers of culture: A study of Japanese and Spanish brand personality constructs.</td>
<td>AMA</td>
</tr>
<tr>
<td>953</td>
<td>Azoulay, and Kapferer (2003)</td>
<td>3</td>
<td>Do brand personality scales really measure brand personality?</td>
<td>Springer</td>
</tr>
<tr>
<td>716</td>
<td>Ekinci, and Hosany (2006)</td>
<td>6</td>
<td>Destination personality: An application of brand personality to tourism destinations</td>
<td>SAGE</td>
</tr>
<tr>
<td>715</td>
<td>Malär, Krohmer, Hoyer, and Nyffenegger, (2011)</td>
<td>12</td>
<td>Emotional brand attachment and brand personality: The relative importance of the actual and the ideal self</td>
<td>AMA</td>
</tr>
<tr>
<td>618</td>
<td>Batra, Lehmann, and Singh, (1993)</td>
<td>8</td>
<td>The brand personality component of brand goodwill: some antecedents and consequences</td>
<td>books.google.com</td>
</tr>
<tr>
<td>552</td>
<td>Geuens, et al. (2009)</td>
<td>9</td>
<td>A new measure of brand personality</td>
<td>Elsevier</td>
</tr>
</tbody>
</table>

Table: 5 Details of Paper ranking citations and publisher.
<table>
<thead>
<tr>
<th>Page</th>
<th>Author(s) (Year)</th>
<th>Journal/ISBN</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>473</td>
<td>Aaker, and Fournier (1995)</td>
<td>ACR</td>
<td>A brand as a character, a partner and a person: Three perspectives on the question of brand personality</td>
</tr>
<tr>
<td>391</td>
<td>Grohmann (2009)</td>
<td>AMA</td>
<td>Gender dimensions of brand personality</td>
</tr>
<tr>
<td>381</td>
<td>Freling, and Forbes (2005)</td>
<td>Emerald Insight</td>
<td>An empirical analysis of the brand personality effect</td>
</tr>
<tr>
<td>380</td>
<td>Usakli, and Baloglu (2011)</td>
<td>Elsevier</td>
<td>The brand personality of tourist destinations: An application of self-congruity theory</td>
</tr>
<tr>
<td>372</td>
<td>Murphy, et al. (2007)</td>
<td>SAGE</td>
<td>Using brand personality to differentiate regional tourism destinations</td>
</tr>
<tr>
<td>372</td>
<td>Venable, et al. (2005)</td>
<td>SAGE</td>
<td>The role of brand personality in charitable giving: An assessment and validation</td>
</tr>
<tr>
<td>364</td>
<td>Siguaw, Mattila, and Austin, (1999)</td>
<td>SAGE</td>
<td>The brand-personality scale: An application for restaurants</td>
</tr>
<tr>
<td>348</td>
<td>Austin, Siguaw, and Mattila, (2003)</td>
<td>Taylor and Francis</td>
<td>A re-examination of the generalizability of the Aaker brand personality measurement framework</td>
</tr>
<tr>
<td>391</td>
<td>Grohmann (2009)</td>
<td>AMA</td>
<td>Gender dimensions of brand personality</td>
</tr>
<tr>
<td>381</td>
<td>Freling, and Forbes (2005)</td>
<td>Emerald Insight</td>
<td>An empirical analysis of the brand personality effect</td>
</tr>
<tr>
<td>380</td>
<td>Usakli, and Baloglu (2011)</td>
<td>Elsevier</td>
<td>The brand personality of tourist destinations: An application of self-congruity theory</td>
</tr>
<tr>
<td>372</td>
<td>Murphy, et al. (2007)</td>
<td>SAGE</td>
<td>Using brand personality to differentiate regional tourism destinations</td>
</tr>
<tr>
<td>372</td>
<td>Venable, et al. (2005)</td>
<td>SAGE</td>
<td>The role of brand personality in charitable giving: An assessment and validation</td>
</tr>
<tr>
<td>364</td>
<td>Siguaw, Mattila, and Austin, (1999)</td>
<td>SAGE</td>
<td>The brand-personality scale: An application for restaurants</td>
</tr>
<tr>
<td>348</td>
<td>Austin, Siguaw, and Mattila, (2003)</td>
<td>Taylor and Francis</td>
<td>A re-examination of the generalizability of the Aaker brand personality measurement framework</td>
</tr>
<tr>
<td>327</td>
<td>Swaminathan, Stilley, and Ahluwalia, (2009)</td>
<td>Academia</td>
<td>When brand personality matters: The moderating role of attachment styles</td>
</tr>
<tr>
<td>301</td>
<td>Keller, and Richey (2006)</td>
<td>Springer</td>
<td>The importance of corporate brand personality traits to a successful 21st-century business</td>
</tr>
</tbody>
</table>

GS: Google Scholar
The article citations and ranking are as per Google Scholar. There are twenty-two papers with citations of over 300. The number of citations has no bearing on the ranking of the article. Jennifer Aaker and her co-authored three papers rank in this list of 22 articles. The combined citation for nineteen articles is 8832. This is less than the citations for Aaker seminal work of 1997 with 8925 citations. No matter how research scholars evaluate Aaker work, the citations speak for her outstanding contribution. Thus, any research is incomplete without referring to Aaker findings.

Authors used word art to extract word cloud shown in Figure 1.

![Figure 1 Word cloud of dimensions](image)

The prominent dimensions in the above figure are sophisticated, exciting, and sincere. These correspond to Aaker dimensions sophistication, excitement and sincerity. The study found 202 dimensions. Table 6 gives the breakup of the dimensions. Frequency is the number of times that dimension occurred in the list of 202.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Frequency</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sophisticated</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Sincere, Exciting</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Competence</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Agreeableness, Ruggedness, Conscientiousness</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Extraversion</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Emotion, Open, Success, Trendiness, Tradition, Aggressive</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>22 dimensions</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>85 dimensions</td>
<td>1</td>
<td>85</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>202</strong></td>
</tr>
</tbody>
</table>

The frequency with dimensions eleven, nine, and seven are same as Aaker. The frequency of five and four are the Big Five dimensions. The article discusses later dimensions with the frequency of one, two, and three. Next, the authors refer to the traits mentioned in Aaker's Brand Personality Scale. Then these traits are matched with the dimensions found in the study. Geuens et al. (2009) scale activity refers to the excitement of the Aaker the dimension. Aggressiveness matches to sincerity and competence with responsibility. Review of other dimensions revealed that some of these to be traits from the Aaker scale. Nevertheless, they are taken as a dimension for some studies. This may be because of ease of adaptation of dimensions/traits for the study. Table 7 depicts revised frequency. It includes the frequency of the matching traits from Aaker scale and the cumulative frequency.
Thirty-nine dimensions are the traits mentioned in Aaker's article. They have a cumulative frequency of fifty-four. Excitement, Sincerity, and competence are noteworthy dimensions.

Then the authors looked up Oxford Dictionary of Thesaurus to look for synonyms for remaining words with the frequency of two and three. It mentions the findings of these in table 8 below.

### Table: 7 Dimensions corresponding to Aaker's BP traits

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Frequency</th>
<th>Aaker Traits</th>
<th>Cumulative Frequency</th>
<th>Aaker Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exciting</td>
<td>9</td>
<td>Daring(1), Trendiness(3 trendy), Spirited(2), Cool(1), Sensation(1), Uniqueness(1 Unique), Activity(2), Bold, (1), Modern(1), Amusing,(2), Timeliness(1), Enterprise(1), Hippness/Vivacity(1)</td>
<td>27</td>
<td>Excitement</td>
</tr>
<tr>
<td>Sincere</td>
<td>9</td>
<td>Honest(1), Originality(1 original), Friendly(2), Aggressive (3), Security(1), Amableness(1), Warmness(1), Credibility(2)</td>
<td>21</td>
<td>Sincerity</td>
</tr>
<tr>
<td>Competence</td>
<td>7</td>
<td>Genuineness(1), Diligent(1), Analytical(1), Intelligence(1)</td>
<td>20</td>
<td>Competence</td>
</tr>
<tr>
<td>Sophisticated</td>
<td>11</td>
<td>Glamorous(1), Classic(1), Chic(1), Resourcefulness(1)</td>
<td>15</td>
<td>Sophistication</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>5</td>
<td>Outdoorsy(1), Tough(2), Western(1), Machismo(1), Sturdy(1)</td>
<td>11</td>
<td>Ruggedness</td>
</tr>
</tbody>
</table>

Figure in parenthesis is the frequency of dimensions; words are as mentioned in Aaker scale. Revised score is the sum of original frequency plus the total of the frequency from the Aaker traits.

### Table: 8 Synonyms for dimensions with frequency two and three.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Frequency</th>
<th>Synonyms (Oxford Thesaurus)</th>
<th>Aaker Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attractive</td>
<td>2</td>
<td>good-looking, nice-looking, beautiful</td>
<td>Sophistication</td>
</tr>
<tr>
<td>Passion</td>
<td>2</td>
<td>fervour, ardour, intensity, enthusiasm, eagerness, zeal, excitement, energy, a spirit, spiritedness,</td>
<td>Excitement</td>
</tr>
<tr>
<td>Dynamic</td>
<td>2</td>
<td>spirited</td>
<td>Excitement</td>
</tr>
<tr>
<td>Emotion</td>
<td>3</td>
<td>passion, intensity, warmth, ardour, fervour, vehemence, fire, fieriness, excitement, spirit,</td>
<td>Excitement</td>
</tr>
<tr>
<td>Conviviality</td>
<td>2</td>
<td>cheerfulness, cheeriness, good cheer, joviality, jollity, gaiety, liveliness, festivity</td>
<td>Sincerity</td>
</tr>
<tr>
<td>Integrity</td>
<td>2</td>
<td>honesty (honest)</td>
<td>Sincerity</td>
</tr>
<tr>
<td>Simplicity</td>
<td>2</td>
<td>modesty, wholesomeness (wholesome)</td>
<td>Sincerity</td>
</tr>
<tr>
<td>Warm</td>
<td>2</td>
<td>friendly, amiable, genial, cordial, kind, pleasant, sympathetic, affectionate, warm-hearted,</td>
<td>Sincerity</td>
</tr>
<tr>
<td>Professionalism</td>
<td>2</td>
<td>white-collar, executive, competent, capable, able, efficient, experienced, practised,</td>
<td>Competence</td>
</tr>
<tr>
<td>Responsibility</td>
<td>2</td>
<td>rationality, stability, maturity, competence, authority, control, power, leadership, management,</td>
<td>Competence</td>
</tr>
</tbody>
</table>
Ten dimensions have synonyms that match with Aaker dimensions. The cumulative frequency for these dimensions is twenty-one.

Some regional specific studies may have considered the traits as dimensions. They are summarised in the following table. Table 9 below indicates these with the original frequency found in the study. Following this is the frequency after adding matching traits with Aaker. Then stated are the frequency of synonyms and the significant dimensions.

Table: 9 Summation of the frequency. (Dimension in the study, Aaker traits, and Synonyms)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Frequency found in study</th>
<th>Aaker Traits Frequency</th>
<th>Synonym Frequency</th>
<th>Cumulative Frequency</th>
<th>Aaker Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exciting</td>
<td>9</td>
<td>18</td>
<td>7</td>
<td>34</td>
<td>Excitement</td>
</tr>
<tr>
<td>Sincere</td>
<td>9</td>
<td>13</td>
<td>8</td>
<td>29</td>
<td>Sincerity</td>
</tr>
<tr>
<td>Competence</td>
<td>7</td>
<td>13</td>
<td>4</td>
<td>24</td>
<td>Competence</td>
</tr>
<tr>
<td>Sophisticated</td>
<td>11</td>
<td>4</td>
<td>2</td>
<td>17</td>
<td>Sophistication</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>5</td>
<td>6</td>
<td></td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

From the 202 dimensions found in the study, 115 dimensions link with the Aaker framework items. The most significant is the excitement, followed by sincerity and competence.

Sophistication too is an important dimension, however; ruggedness has a relatively low frequency.

In the following table 10 it analyses the remaining dimensions in relation to the big five factors.

Table 10 Big Five dimensions

<table>
<thead>
<tr>
<th>Big Five Dimensions</th>
<th>Dimensions found in the study</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open to Experience</td>
<td>Open to Experience (4), Tradition(3), Traditionalism, Open Mindedness, Intellect,</td>
<td>10</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Conscientiousness (5), Competitiveness, Proud, Solidity, Care</td>
<td>9</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Extraversion (4), Uninhibitedness, Enthusiasm, Passionate, Drive, Assertiveness, Adventurous</td>
<td>10</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Agreeableness (5), Aggressive(3), Unpleasant, Superficiality, Ruthlessness, Nurturance, Morality, Likeableness, Elitism</td>
<td>15</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>Emotional(2), Emotional Stability(2), Neuroticism(2), Nurturance</td>
<td>7</td>
</tr>
</tbody>
</table>

The table above is the summation of the dimensions of Big Five, which accounts for 51 of the study dimensions. The second column has traits of big five, referred to as dimensions by some authors. Agreeableness is the oft-en-used dimension followed by openness to experience and extraversion.

There were thirty-six more dimensions with a frequency of one. These are unique for the specific study.

Conclusion:

The article represents an overview of the academic research on dimensions of brand personality. The study reviewed extant literature and compiled the different brand personality dimensions. Brand personality, like human personality, is multidimensional with a diverse application. Strong evidence emerged for three of Aaker's brand personality dimensions. These are excitement, and sincerity followed by competence. The results appear to be consistent.
with the findings of Aaker, 2000; Aaker, et al., 2001; Kim and Park 2001; Ross (2008). The other dimensions found in the study but with a low score were the Big Five. (Extraversion, Agreeableness, and Conscientiousness).

Despite the significant findings by authors, further studies are required. Further research work can build on the fundamental dimensions of brand personality. Excellent work by scholars contributed to the development of dimensions of brand personality. Further investigations on varied products, would add to the consolidation of brand personality dimensions.

Implications:

Brand personality research received immense importance post the work by Aaker (1997). She stated, “The best way to compile adjectives is still not defined.” Authors did not reach consensus on the definition, concept, and the basic tenets. This is despite the tremendous progress in the study of brand personality in the past decade. Future studies may use excitement and sincerity as the primary dimensions. Reference to other dimensions may be study specific. This may depend upon the product, service categories, and the region of study.

Cultural importance in determining the consumer's perception of brands is noteworthy. Brand portfolio management is an essential function of marketers. Brand personality dimensions may provide a different perspective. Based on these personality dimensions brand managers may add, remove, or reposition their brands. Brand personality can assist to incorporate effective strategies to improve their customer relationships. Hence, brand personality can generate consumer engagement. Positioning leads to better consumer engagement with the brand and encourages brand advocacy.

Brand Personality remains as one of the most sustainable tools for differentiation. It plays a significant role in brand positioning. Other attributes like the product, price etc may lose their significance.

A Bibliometric investigation provides the trends in a research field. These can be useful for developing a strategy related to brand management.

Limitations and Future Scope:

As this paper suggests, brand personality as a concept requires more research. Increased research in recent years is an endorser of this. Ample scope for further research exists. Studies can elaborate on the acceptance of the three fundamental brand personality dimensions. Future research can compare these dimensions between developed and emerging markets. Future research may examine the applicability of dimensions both for tangible and non-tangible products. Scholars may study how the brand personality evolves over the product life cycle.

The study provides useful insights into the dimensions of brand personality, with limitations. Review of all articles in the vast data set is a challenge.

Aaker’s (1997) study stated honest a trait and a facet for the dimension sincerity. Competence dimension has reliable as a trait and a facet. Both these traits honest and reliable have common synonyms (Lieven, 2017). Translations can mislead, incorrect and confusing when applied in a specific context. There can be no assurance on the studies compiled in the literature review are free of error.

References


Measuring the Business Performance: Sole Proprietors in Puducherry

Sankar R.
Research Assistant
Department of Management Studies
Pondicherry University Community College
Lawspet, Puducherry
E-mail: sankar2130@gmail.com

Abstract
Major aim of this research is to identify the performance of the business among the sole proprietors. Based on the brief review of studies and the research gap identified, the constructs such as business policies, customer relations, supplier relations, sole proprietor's views towards the business and entrepreneurial empowerment are the inducers of the business performance. Data for this purpose have been obtained from the 200 sole proprietors in Puducherry via convenience sampling technique. Collected data are analysed through reliability and validity analysis, descriptive statistics, and Kruskal Wallis H test. Study has found that the factors like experience, number of dependents and income level have a significant difference with the business performance of the respondents. It has been also identified that entrepreneurial empowerment is significantly related with the business performance of the respondents by .170 coefficients at 5% level of significance. Suggestions such as development of better health facilities in the study area and improving the quality education at free of cost to meet the dependents care which in turn would lead to the rise of business performance have been provided.

Keywords: Business Performance, Business Policies, Customer Relations, Supplier Relationships, Sole Proprietor's views Entrepreneurial Empowerment.
Entrepreneurship is an act of investing money with the capacity of risk taking for the purpose of selling the goods and services to the customers and the consumers in return of the profits. A person who undertakes such entrepreneurial activities are known as the Entrepreneurs. The persons who are involved in running a business by themselves and who is responsible for all the debts of his own business are known as the sole proprietors. Such sole proprietorship business is not a separate legal entity as a company. However, such sole proprietorship has its own documentation and registration process. Since, the sole proprietorship has been controlled by a single person, the success rate ultimately lies upon the sole proprietors' activities and the variables focusing the sole proprietor as the central point. So, for the purpose of critically analysing this challenging and the neglected sector of research, this study has considered sole proprietors as the respondents for the study.

As stated above, such sole proprietors' performance over their business is influenced by certain factors. As there are already many studies been done by the authors and the researchers such as Muhammad Haris Qureshi, et al., (2012); Simon Mamadi Shiamwama, et al., (2014); Mbuga Stephen Kamunge et al., (2014); Oh Teik Hai, et al., (2011) and Sagire Lucas (2017) with the object of identifying the factors inducing the business performance of the small scale enterprises situated outside India. There is a need for studying about the business performance of the sole proprietors located in Puducherry (Union Territory) of India. So, to cater this need, this study has been undertaken.

Puducherry is a geographical location with a greatest tourist attraction in India. As Puducherry is a French colony, with many French citizens settled in India have started their very own business along with many local person handling businesses in the Puducherry. So, for evaluating the business performance of such inter-cultural town with high heritage, this study has been undertaken. The study is designed in such a way to cater the needs of all the stakeholders such as for the business persons with a view to have a greater probabilities of identifying the factors influencing their business performance, for the students, researchers and market analysts for obtaining a complete picture of the sole proprietorship business in Puducherry region and ultimately for the government to frame the necessary policies for the betterment of their business which in turn accelerates the growth of the nation.

In this study, the factors influencing the business performance of the sole proprietors are initially identified through the unstructured interviews conducted among the selected respondents. After the thorough examination of the data gathered from the samples five influencing factors has been identified as the predictors of the business performance. In addition to this, the demographic and the socio-economic factor of the interviewees is also sorted out and their relationship with the business performance is assessed. Results and the suggestions to be followed to improve the business performance have been discussed briefly in this study.

Critical examination of the earlier studies on business performance of entrepreneurs

Tundui, C. and Tundui, H. (2012) discovered that the ownership of the several businesses has a strong effect on the profitability of the SMEs in Tanzania. Charlotte Yapp and Robyn Fairman (2006) explored that the problems such as absence of trust among the officials, non-existence of dealing with the food safety legislation are responsible for the poor food safety amenableness among SMEs in United Kingdom. Dariusz Leszczynski (2016) identified that the acquisition of expertise human talents, offerings of inland products to the worldwide clienteles, sufficient monetary capitals are the major factors responsible for the successful performance of the business enterprises in Poland.

Marion Mbogo (2011) revealed that the training and accounting skills of the risk takers are the key factors instrumental in the success of the employees. S.Y. Akomea and J.K.G. Yeboah (2011) exposed that the marketplace orientation is positively and significantly associated with the professional performance of the firms. Olumayowa Olyede et al., (2016) explored that 5% of the second generation real estate business owners are carrying out their ancestors' business.

Olutayo K. Osunsan (2015) found that there is a significant difference between the male and female business owners located in KAMPALA, Uganda. Besnik A. Krasniqi (2007) discovered that the constructs such as heavy tax problems, biased competition, insufficient funding and business size are the major hindrances in the growth of the business. Fionna Griseldis Lisjanto and Asep Darmansyah (2018) opened up that there are significant differences amid the sole proprietorship and partnership types of small business with respect to their book keeping.

Sultan Singh, et al. (2014) concluded that the Sole proprietors are uninformed about the intellectual property rights and its usage in the businesses. Michael H. Morris et al. (2006) found that the medium and large women businesspersons possess differences in their ways of views,
family size, venture size and the bigger environment. John Kitching and David Smallbone (2012) conducted a research study to identify and differentiate among the freelancers and the small scale workers in UK. Through the study, they have found that the freelancers are the newest growing forms of small businesses in the country. Karl W. Sandberg (2003) revealed that there is a significant difference among the male and the female entrepreneurs in their operations of the businesses.

Wee Yu Ghee et al. (2015) found that the style of management, family relationships, and descendant trainings induces the performances of the family businesses. Jane Bryan (2006) found that the training has an optimistic association with that of the sales performance of the workers. Ashok K. Mishra et al. (2002) found that the profitability of the micro farms is induced by the constructs such as age of the worker, size of the farms and insurance for the crops. Aruna S. Gamage (2014) identified that there is an optimistic and resilient association among the recruitment, corporate practices with that of the performance of the SMEs in Japan.

Jim Lee (2006) revealed that the performance of the organization goes up when the founders of such family business are actively taking part in the business. William L. Cron, et al., (2006) explored that female business owners is less experienced as compared to that of their male competitors. Adegbite, S.A., et al., (2006) found that experience in running the business and other professional experience has a constructive impact on the work performance of the employees. Pattarawadee Permwanichagun et al. (2014) identified the factors such as the cost of investment into the businesses and knowledge to be businessmen are considered to be the major hindrances of the sole proprietors.

Sagire Lucas (2017) discovered that the education and the age of the business have a constructive link with that of the firm's performance in Kenya. Oh Teik Hai and Lim Meng See (2011) discovered that the gender and the age possess an optimistic association on the non-compliance with the tax paying of the sole proprietors. Mbugu Stephen et al., (2014) discovered that fund accessibility and the managerial experience are the constructs responsible for the improved performance of the firms in Kenya. Simon Mamadi Shiamwama et al. (2014) discovered that financial steadiness and businessperson skills are the major inducers of the business performance among the retired employees in Kenya. Muhammad Haris Qureshi, et al. (2012) revealed that the male owned businesses are more successful than their female competitors. A. Pandu and Sankar, R. (2018) found that the absence of work has a stronger influence on the work life balance of the self-employed women in Chennai.

**Research gap**

Since, as the majority of the studies are conducted with a theme of identifying the factors influencing the business performance of the entrepreneurs such as those done by authors like Leann M. Tigges and Gray P. Green (1994), Kathryn Watson et al. (1998), Davidson et al., (2002), Paul Jones et al. (2014) and RT Harrison and M. Hart (1982) i.e., Leann M. Tigges and Gray P. Green concentrated on assessing the factors inducing the business success among the male and female owned businesses in the rural areas of United States, Kathryn Watson et al. (1998) conducted a research with the object of identifying the factors responsible for success of the small businesses located in United Kingdom, While Davidson et al., (2002) focused on exploring the factors responsible for the growth of the business situated in Sweden, the authors like Paul Jones., et al. (2014) investigated about the approaches and the responses responsible for the adoption of Information and communication technology for their micro enterprises located in Europe. Researchers such as RT Harrison and M. Hart (1982) conducted a research study for investigating the factors instrumental for the formation of new businesses among the people in Northern Ireland. Considering all these research studies, they all concentrated on the factors responsible for the success of the small businesses situated outside India. In addition to this, these studies also failed to investigate about the business performance of the sole proprietors in Puducherry region with the influencing factors such as business policies (BP), customer relationships (CR), supplier's relationships (SR), sole proprietor's views towards the business (SPVTB), entrepreneurial empowerment (EE) and business performance (BP). So, in order to fulfil this research gap, this study has been undertaken.

To be more specific, the research works done by the researchers such as Dinesh Vallabah and Osward Mhlanga (2014), Sagire Lucas (2017) and P.S. Raghu Kumari and Pankaj Trivedi (2016) concentrated on the impact of the demographics separately and socio-economic constructs separately on the business performance of the entrepreneurs. But, no studies has been conducted with the object of identifying the effect of both the demographics (age group, work experience in years, number of dependents, number of children and income level) and
organizational factors on the business performance of the sole proprietors on the same study. Henceforth, to fulfill this research gap this study has been conducted with this object.

**Objective of the study**

Major objective of this research work is to examine and investigate the relationship amid the demographics and socio-economic constructs with that of the influencers of performance and also with that of the business performance. The ancillary objective is to identify the association between the empowerment and the business performance of the sole proprietors. The study also provided the suggestions to improve the performance of the sole proprietorship business.

**Limitations of the study**

As the study is conducted with limited constructs three demographic factors along with two socio-economic constructs, and on the other hand, with five influencing constructs of the performance to measure the business performance among sample size being restricted to 200 sole proprietors and further limited within Puducherry town, the study projects these results. If the number of factors are modified with the alteration in the sample size, procedure, methods, area and settings, then there are chances of obtaining different results.

**Relationship between the demographics, socio-economic constructs and business performance**

Demographic constructs of the sole proprietors have a relationship with that of the performance of their businesses. Age group of the businesspersons plays a strong role in inducing their business performance. Since most of the studies namely V. Kanti Prasad, et al., (2015) and Simon Radipere & Shepherd Dhlwayo (2014) found that the age of the entrepreneurs has no significant relationship and also causes an inverse association with that of the business performance of the entrepreneurs. No studies predicted the presence of the positive relationship between the age of the business performance. So, to test whether the age has a positive or inverse effect on the firm's performance, the following hypothesis has been framed.

\[ H_1: \text{Age group of the sole proprietors has a significant and positive difference on the factors inducing performance and the business performance.} \]

Experience in running the business organization plays a vital role in the determination of the business performance of the workers (Avraam Papastathopoulos and Christina Benek, 2010, Sandra Gottschalk et al., 2014 and Myung Su Park et al., 2017). There may be either positive or inverse relationship between the entrepreneurial experience and the performance of the sole proprietorship. Therefore, to assess the type of connection among these factors, the following hypothesis has been framed.

\[ H_2: \text{Experience of the workers has a constructive difference with that of the influencers of the performance and also with the business performance of the businesspersons.} \]

Similar to the number of children factor, the number of dependents of the entrepreneurs has a heavier effect on the business performance. This relationship is subject to change i.e., it may either have a positive or a negative consequence among the dependents and the business performance. Hence, to evaluate the association amid the number of dependents with that of the firm's performance, the following hypothesis has been framed.

\[ H_3: \text{There is a positive difference among the number of dependents, predictors of performance and the business performance of the businesspersons.} \]

Considering the number of children for the businesspersons, this decides the performance of the business firms. For any organization, whatever may be the type either sole proprietorship, partnership firm, registered company or any business, child-care has a strong and a direct impact on the firm's performance (Maduenyoghasi et al., 2015). In some cases, there may also be no such direct association arouse amid the children and the business performance of the entrepreneurs. For the purpose of verifying the nature of relationship between the number of children and the sole-proprietorship’s business performance, the following hypothesis has been framed.

\[ H_4: \text{Number of children, factors affecting performance and the performance of the businesses are affirmatively differed among one another.} \]

Level of income from other sources plays a chief role in deciding the level of performance of the sole proprietorship business. Income from other sources in this context includes those incomes other than the business income such as income from rent, spousal income and many more. Since, there are no researches were found on investigating the relationship between the level of income from other sources with that of the performance of the sole proprietorship business and to fulfil this research gap, the following hypothesis has been identified.
**H₅:** Income level from other sources has a significant difference amid the inducers of the performance and the final performance of the businesses.

Relationship between the influencers with that of the performance of the sole proprietorship Performance of the business has been influenced by many factors which changes from the business to businesses. Certain factors remain common for all types of businesses in influencing their performance. Among the most common factors, the policies of the business organization have a stronger and a significant association with that of the performance of the organization (Patrick M. Wright, et al. 2003). In other words, it could be better stated that through the adoption of proper strategies, the performance of the business would arise (Ilori David Babafemi, 2015). As all the studies, deals with the performance of the large scale organizations and corporates, the sole proprietorship business is identified to be the neglected form of business. Henceforth, to assess this relationship between the business policies and the work performance, the business performance has been identified as the influencer of the sole proprietorship business performance.

The implementation of better long term sustainability with the stakeholders has strong implications with the performance of the business (Robert G. Eccles et al., 2014). Retaining the customers through satisfying them by providing the valuable goods and services from the business is the essence of improving the businesses of any organization. Henceforth, it could be stated that the management of the stable relationships with the customers improves the performance of the business and results in ultimate profits and profitability in the foreseeable future (Rozitta Chittai, 2012, Werner Reinartz, et al., 2004). As the studies done by the authors such as Chao-Hsiung Lee, et al., 2010, Petr Suchanek and Maria Krilova, 2015, Alemu Muleta Kebede and Zewdu Lake Tegegne, 2018 and many more on assessing the relationship between the customer relationships and the business performance are only on the corporate companies consisting of huge manufacturers and that of the service organizations like banks, they all failed to study about this relationship among the sole proprietors and for this purpose, the customer relation is added to be predictor of the business performance. Similarly, the relationships with the suppliers also considered to be very vital for the improvement of the business performance. Supplier's goods supplying performance determines the business performance of the organization (Inayatullah, et al., 2012). Based upon the quality goods delivered, timely meeting the demands through the supply of products and extending goods on credit based upon the goodwill of the entrepreneurs are the key reasons for considering the supplier's relationships as the one of the stimuli of the organizational performance.

Performance of the business is determined by the views and the feelings of the entrepreneurs. The entrepreneurs with critically examining skills are more successful in the business (Ian Chaston, 2014). Henceforth, for this reason, the sole proprietor's views towards the organization have been added up the inducing factors list on the study. Entrepreneurial empowerment is the crucial term which could be referred as the empowerment of the entrepreneurs by making them feel privileged in performing their business. This in turn leads to the improvement of the performance of their business. Since, there are only studies which focuses on the relationship between the women empowerment and the entrepreneurship such as those conducted by Nimalathasan Balasundaram, et al. (2014), Geetha Sulur Nachimuthu and Barani Gunatharan (2012) and Stanzin Mantok (2016), there is an absence of identifying the effect of entrepreneurial empowerment with that of their business performance, this entrepreneurial empowerment has been identified for the study. To identify the relationship between the entrepreneurial empowerment and the business performance, the following hypothesis has been framed.

**Hₓ:** Entrepreneurial empowerment has a significant relationship with the business performance.

### Research Methods

#### Methods and techniques of sample collection

The data for the study has been collected through convenience sampling technique. Since, many of the retail outlets in the specified sample area does not adhere to disclose about their business information, it becomes practically difficult for the researcher, to gather the necessary data for the study. Henceforth, due to the presence of easy method, the data has been gathered through this method from those business persons who showed interest to be a part of this research work.

#### Sample size, setting and region, response rate and period of study

Through the extensive review of literature and by going through the research gap identified for the study, the study selected sole proprietorship type of business as the sample setting. The study adopted sole proprietors as the samples for the study. The questionnaire has been distributed to 287
samples and 217 entrepreneurs returned it with a response rate of 75.61% and finally, only the questionnaires filled by 200 businesspersons has been found to be usable and valid for the study purpose with a response rate 68.69%. Considering the easier access to the data and the absence of such studies on measuring the business performance among the sole proprietors, this study has been conducted in the Puducherry. The period of the study is done from June 2018 to November 2018.

Measurement of the samples

Prior to the pilot study and the collection of data through the structured questionnaire, an unstructured interview schedule is conducted among a sample size of over 30 respondents who does not forms part of the final sample size i.e., 200. This interview schedule is done in order to identify whether the selected influencers of the business performance actually matches with the real time business situations. After confirming that the predicting factors taken for the study actually predicts the business performance of the workers, the study further proceeded with the collection of data.

Factors considered for the study

Based on the confirmation obtained through the unstructured interview schedule, the demographic constructs such as age group, number of children and number of dependents and the socio-economic factors like years of experience and levels of income from other sources are taken for the study. On the other hand, the influencing factors of business performance such as business policies, customer relationships, supplier's relationships, sole proprietor's views towards the business and entrepreneurial empowerment are considered for the study. The resulting construct i.e., business performance is considered for the research work.

Pilot study

Pilot study is being conducted among the 50 cases and they also does not forms part of the final sample size. This pilot study is done in order to test the consistency and the validity of the questionnaire. It has been measured using the cronbach's alpha scale of validity and reliability. .718 is the cronbach's alpha value of reliability for an instrument containing 30 items among 50 cases. As the cronbach's alpha score is greater than 0.7 which is an acceptable reliability, the questionnaire is considered to be reliable and valid and it has been approved for carrying on the further data collection.

Tools applied for analysing the data

Major tools applied for the purpose of the analysing the data are descriptive statistics such as the mean and the standard deviation for the purpose of arriving at the most driving items that influences the each and every study factors. Kruskal-Wallis H test has been applied to identify the association between the demographics and socio-economic factors with that of the influencers and the business performance factors. Pearson correlation is applied for assessing the relationship between the empowerment and the business performance of the entrepreneurs.

Data Analysis and Interpretation

Table 1: Mean and Standard deviation of the study factors

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Statements</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Factors influencing business performance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1. Business policies (BP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>I have designed the policies in my business as that of attracting the customers.</td>
<td>4.4550</td>
<td>.92859</td>
</tr>
<tr>
<td>2.</td>
<td>Attractive customer policies gives me immense profits.</td>
<td>4.1600</td>
<td>.86495</td>
</tr>
<tr>
<td>3.</td>
<td>Business policies are designed as per the rules and regulations of the local area business associations of particular domain.</td>
<td>4.2100</td>
<td>.96465</td>
</tr>
<tr>
<td>4.</td>
<td>In addition to the profit motive, my business also takes up the social responsibility.</td>
<td>3.9100</td>
<td>.85178</td>
</tr>
<tr>
<td>5.</td>
<td>Successful business policies improves my business performance.</td>
<td>4.0150</td>
<td>.89374</td>
</tr>
</tbody>
</table>
The above table describes the mean and standard deviation for the items considered for the study. Among the influencers of the business performance, the business policies construct is identified to be the most influencing construct as it has the highest mean score of around 4.1500 value with the most influencing items of BP1=4.4550, then by the BP3=4.2100, BP2=4.1600, BP5=4.0150 and then at last by BP4=3.9100, followed by it, the next inducing construct of the business performance is EE at 3.8870 mean with the items such as EE21=3.9900, EE22=3.8900, EE24=3.8800, EE25=3.8450 and then EE23=3.8300, then the performance of the sole proprietorship by sole proprietor’s views towards the business at 3.8610 mean with items such as SPV TB16=3.9400, SPV TB18=3.8700, SPV TB19=3.8550, SPV TB17=3.8400 a n d SPV TB20=3.8000. Then the performance of the business among the entrepreneurs is influenced by customer relationships at 3.7700 with items CR6=3.8800, CR10=3.8350, CR9=3.7450, CR8=3.7100 and CR7=3.6800. Lastly, the relationships with the suppliers influences the business performance, the least at 3.7370 mean with the items such as SR14=3.8350, SR15=3.8050, SR11=3.7850, SR13=3.6650 and SR12=3.5950. Business performance (outcomes) factor has 3.9140 mean with the items such as BO26=3.9900 mean, BO27=3.8900 mean, BO29=3.8800 mean, BO30=3.8450 mean and BO28=3.8300 mean (Refer table 1 for the items).
Table 2: Frequency distribution of the demographic profile of the sole proprietors

<table>
<thead>
<tr>
<th>Factors</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30 years</td>
<td>45</td>
<td>22.5%</td>
</tr>
<tr>
<td>31-40 years</td>
<td>30</td>
<td>15.0%</td>
</tr>
<tr>
<td>41-50 years</td>
<td>76</td>
<td>38.0%</td>
</tr>
<tr>
<td>Above 50 years</td>
<td>49</td>
<td>24.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>176</td>
<td>88.0%</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>12.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Experience (in years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upto 10 years</td>
<td>45</td>
<td>22.5%</td>
</tr>
<tr>
<td>Above 10-15 years</td>
<td>78</td>
<td>39.0%</td>
</tr>
<tr>
<td>Above 15 years</td>
<td>77</td>
<td>38.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Number of Children</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No children</td>
<td>12</td>
<td>6.0%</td>
</tr>
<tr>
<td>Upto 1 child</td>
<td>57</td>
<td>28.5%</td>
</tr>
<tr>
<td>2 Children</td>
<td>89</td>
<td>44.5%</td>
</tr>
<tr>
<td>3 and above children</td>
<td>42</td>
<td>21.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Number of dependents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2 dependents</td>
<td>32</td>
<td>16.0%</td>
</tr>
<tr>
<td>3-5 dependents</td>
<td>96</td>
<td>48.0%</td>
</tr>
<tr>
<td>Above 5 dependents</td>
<td>72</td>
<td>36.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Business description</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groceries</td>
<td>67</td>
<td>33.5%</td>
</tr>
<tr>
<td>Vegetable sellers</td>
<td>34</td>
<td>17.0%</td>
</tr>
<tr>
<td>General merchants</td>
<td>51</td>
<td>25.5%</td>
</tr>
<tr>
<td>Others</td>
<td>48</td>
<td>24.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Annual income (in lakhs) from other sources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upto 5 lakhs</td>
<td>29</td>
<td>14.5%</td>
</tr>
<tr>
<td>Above 5-10 lakhs</td>
<td>138</td>
<td>69.0%</td>
</tr>
</tbody>
</table>

*Source: Primary data*
The above table describes the frequency distribution of the demographic profile of the workers. Considering the age group of the entrepreneurs, 45 respondents (22.5%) are aged between 21-30 years of age, 30 interviewees (15.0%) are aged within 31-40 years of age, 76 workers (38.0%) are aged from 41-50 years of age and 49 businesspersons (24.5%) are aged from above 50 years. Taking into account, the gender of the sole proprietors, 176 persons (88.0%) are male and 24 individuals (12.0%) are females. As far as the business experience of the respondents are concerned, 45 interviewees (22.5%) has experience of upto 10 years, 78 entrepreneurs (39.0%) are experienced from above 10-15 years and 77 businesspersons (38.5%) are having experience of above 15 years in the business. Concerned with the number of children, 12 entrepreneurs (6.0%) has no children each, 57 businesspersons (28.5%) has upto 1 child each, 89 sole proprietors (44.5%) has 2 children each and 42 interviewees (21.0%) has 3 and above each children. Attention is devoted towards the number of dependents construct of the respondents, 32 interviewees (16.0%) has 0-2 dependents each, 96 businesspersons (48.0%) has 3-5 dependents each and 72 entrepreneurs (36.0%) has above 5 dependents each. As far as the business description of the businesspersons are considered, 67 entrepreneurs (33.5%) are involved in grocery business, 34 respondents (17.0%) are selling vegetables, 51 interviewees (25.5%) are general merchants and the remaining 48 interviewees (24.0%) are running other types of business such as barbers, mechanics, pawn brokers, fast foods, hotels and street vendors. Considering the annual income of the respondents from other sources, 29 entrepreneurs (14.5%) are earning upto 5 lakhs per annum as their annual income, 138 businesspersons (69.0%) are making an income within Rs.5-10 lakhs p.a. and 33 interviewees (16.5%) are receiving above 10 lakhs per annum as the annual income.

**H₀**: Age group of the sole proprietors has a significant and positive difference on the factors inducing performance and the business performance.

### Table 3: Kruskal Wallis H test for the significant difference of the age group on the study factors

<table>
<thead>
<tr>
<th>Factors</th>
<th>Business policies</th>
<th>Customer relationships</th>
<th>Supplier’s relationships</th>
<th>Sole proprietor’s views towards the business</th>
<th>Entrepreneurial Empowerment</th>
<th>Business performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td>21-30 years</td>
<td>31-40 years</td>
<td>41-50 years</td>
<td>Above 50 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi-square</td>
<td>111.36</td>
<td>117.72</td>
<td>119.72</td>
<td>80.56</td>
<td>103.52</td>
<td>101.61</td>
</tr>
<tr>
<td>p value</td>
<td>.044</td>
<td>.015</td>
<td>.076</td>
<td>.026</td>
<td>.153</td>
<td>.218</td>
</tr>
</tbody>
</table>

Source: Primary data

* Significant at 5% level.

The above table shows the significant effect of the age group on the study constructs. As the p values of business policies (.044), customer relationships (.015) and the sole proprietors’ views towards the business (.026) are lower than that of 0.05, the alternative hypothesis is accepted at 5% level of significance. Henceforth, it could be inferred that the age group of the sole proprietors has a significant and positive effect on the business policies, customer relationships and the sole proprietor’s views towards the organization. Since, the p values of supplier’s relationships (.076), the
entrepreneurial empowerment (.153) and the business performance (.218) are greater than 0.05, the alternative hypothesis is rejected at 5% level. Thus, it could be stated that age group has no significant difference among the supplier's relationships, entrepreneurial empowerment and the business performance at 5% level of significance.

On the basis of the mean scores, the study found that the entrepreneurs aged from 41-50 years of age have greater business performance as they have a higher mean score of 121.46. This is because, the influencing factors of such business performance also have highest mean scores as compared to that of the respondents in other age groups i.e., the business policies with 119.72 mean, customer relationships=127.20 mean, supplier's relationships=126.52 mean, sole proprietor's views towards the business=132.78 mean, Entrepreneurial Empowerment=127.33 mean. While, the sole proprietors aged above 50 years has reduced business performance with 94.07 mean with its influencers having reduced level of mean scores such as business policies=80.56, customer relationships=82.63, supplier's relationships=88.02, sole proprietor's views towards the organization=91.57 and Entrepreneurial Empowerment=96.83.

Table 4: Kruskal Wallis H test for the significant difference between the experience and the study factors

<table>
<thead>
<tr>
<th>Factors</th>
<th>Experience (in years)</th>
<th>Chi-Square</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upto 10 years</td>
<td>Above 10-15 years</td>
<td>Above 15 years</td>
</tr>
<tr>
<td>Business policies</td>
<td>114.00</td>
<td>108.65</td>
<td>127.86</td>
</tr>
<tr>
<td>Customer relationships</td>
<td>109.51</td>
<td>107.59</td>
<td>141.55</td>
</tr>
<tr>
<td>Supplier's relationships</td>
<td>104.67</td>
<td>108.30</td>
<td>149.05</td>
</tr>
<tr>
<td>Sole proprietor’s views towards the organization</td>
<td>116.15</td>
<td>103.73</td>
<td>142.52</td>
</tr>
<tr>
<td>Entrepreneurial Empowerment</td>
<td>108.38</td>
<td>106.83</td>
<td>146.92</td>
</tr>
<tr>
<td>Business performance</td>
<td>100.65</td>
<td>113.42</td>
<td>137.59</td>
</tr>
</tbody>
</table>

Source: Primary data
* Significant at 5% level
** Significant at 1% level

The above table describes the Kruskal Wallis H test for the significant difference between the experience and the study factors. Since, the p values of customer relationships (.026) and business performance (.029) are lower than 0.05, the alternative hypothesis is accepted at 5% level of significance. So, it could be concluded that number of children are affirmatively differed with the customer relationships and with that of the business performance. As the p values of supplier relationships (.003), sole proprietor's views towards the business (.009) and entrepreneurial empowerment (.006) are lower than .001, the alternative hypothesis is accepted at 1% level of significance. Henceforth, it could be stated that the number of children were favourably differed with the supplier relationships, sole proprietor's views towards the business and the entrepreneurial empowerment at 1% level of significance.

Based on the mean score, it has been revealed that the sole proprietors having more than 15 years of experience are performing well in their business since they has a higher mean score of 137.59 mean. Their influencers has the mean scores such as business policies=127.86 mean, customer relationships=141.55 mean, supplier relationships=149.05 mean, sole proprietor's views towards the organization=142.52 mean and entrepreneurial empowerment=146.92 mean.

$H^5$: There is a positive difference among the number of dependents, predictors of performance and the business performance of the entrepreneurs.
The above table describes the Kruskal Wallis H test for the significant difference between the number of dependents and the business performance of the entrepreneurs. As the p values of business policies (.018) are lesser than 0.05, the alternative hypothesis is accepted at 1% level of significance. So, it could be inferred that the number of dependents has a positive difference with that of the business policies at 5% level of significance. Since, the p values of customer relationships (.001), supplier relationships (.009), entrepreneurial empowerment (.001) and the business performance (.000), the alternative hypothesis is accepted at 1% level of significance. Therefore, it could be concluded that number of dependents has a positive difference with that of the customer relationships, supplier relationships, entrepreneurial empowerment and the business performance at 1% significance level. Sole proprietor's views towards the organization (.071) has a p value greater than 0.05, the alternative hypothesis is rejected at 5% level. Hence, it could be concluded that there is no positive difference with that of the number of dependents and the sole proprietor's views towards the organization at 5% level of significance.

Depending on the mean score, it has been identified that the respondents with upto 2 dependents has greater business performance with a higher mean score of 132.53 value. The influencing factors has a mean value as follows, business policies=122.8 mean, customer relationships=131.45 mean, supplier's relationships=122.18 mean, sole proprietor's views towards the organization=118.70 mean and entrepreneurial empowerment=133.28 mean. While the sole proprietors having more than 5 dependents has low business performance with 83.98 mean with the inducing constructs such as business policies=83.43 mean, customer relationships=81.02 mean, supplier's relationships=80.25 mean, sole proprietor's views towards the organization=87.93 mean and entrepreneurial empowerment=79.75 mean.

\( H_0^1: \) Number of children, factors affecting performance and the performance of the businesses are affirmitively differed among one another.

Table 6: Kruskal Wallis H test for the significant difference between the number of children and the business performance of the entrepreneurs.

<table>
<thead>
<tr>
<th>Factors</th>
<th>No Children</th>
<th>One</th>
<th>Two</th>
<th>Three and above</th>
<th>Chi-square</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business policies</td>
<td>95.19</td>
<td>104.28</td>
<td>135.42</td>
<td>111.50</td>
<td>16.904</td>
<td>.001***</td>
</tr>
<tr>
<td>Customer relationships</td>
<td>98.17</td>
<td>112.49</td>
<td>127.28</td>
<td>112.88</td>
<td>8.117</td>
<td>.044*</td>
</tr>
<tr>
<td>Supplier’s relationships</td>
<td>99.31</td>
<td>105.51</td>
<td>128.29</td>
<td>128.71</td>
<td>9.547</td>
<td>.023*</td>
</tr>
<tr>
<td>Sole proprietor’s views towards the business</td>
<td>101.35</td>
<td>110.02</td>
<td>124.77</td>
<td>118.00</td>
<td>5.541</td>
<td>.136</td>
</tr>
<tr>
<td>Entrepreneurial Empowerment</td>
<td>100.10</td>
<td>113.62</td>
<td>122.79</td>
<td>126.46</td>
<td>5.506</td>
<td>.096</td>
</tr>
<tr>
<td>Business performance</td>
<td>98.81</td>
<td>115.46</td>
<td>124.07</td>
<td>118.00</td>
<td>6.338</td>
<td>.138</td>
</tr>
</tbody>
</table>

Source: Primary data

** indicates significant at 1% level.
* indicates significant at 5% level.
The above table describes the Kruskal Wallis H test for the significant difference between the number of children and the business performance of the sole proprietors. Since, the p value (.001) of business policies is lesser than .001, the alternative hypothesis is accepted at 1% level of significance. Henceforth, it could be stated that number of children is affirmatively differed with the business policies at 1% significance. As the p values of customer relationships (.044) and supplier relationships (.023) are lower than 0.05, the alternative hypothesis is accepted at 5% level of significance. So, it could be stated as the number of children has an affirmative difference with that of the customer relationships and the supplier relationships at 5% level of significance. So, it could be inferred that number of children is affirmatively differed with the customer and supplier's relationships at 5% level. The p values of sole proprietor's views towards the business (.136), entrepreneurial empowerment (.096) and the business performance (.138) are greater than 0.05, the alternative hypothesis is rejected at 5% level of significance. Therefore, it could be concluded that the sole proprietor's views towards the business, entrepreneurial empowerment and business performance has no affirmative difference with that of the number of children. Based on the mean score, it has been identified that the business of those sole proprietors who has two children is higher as they have the highest mean score of 124.07 value. While, the workers having no children possess low business performance and they have a low mean score of 98.81 value.

\(H_{0}^{+}: \text{Income level from other sources has a significant difference amid the inducers of the performance and the final performance of the businesses.}\)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Annual Income (in lakhs)</th>
<th>Chi-Square</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upto 5 Lakhs</td>
<td>Rs.5-10 lakhs</td>
<td>Above 10 lakhs</td>
</tr>
<tr>
<td>Business policies</td>
<td>75.91</td>
<td>110.18</td>
<td>130.40</td>
</tr>
<tr>
<td>Customer relationships</td>
<td>82.56</td>
<td>114.58</td>
<td>122.81</td>
</tr>
<tr>
<td>Supplier’s relationships</td>
<td>82.41</td>
<td>109.92</td>
<td>128.22</td>
</tr>
<tr>
<td>Sole proprietor’s views</td>
<td>78.72</td>
<td>114.47</td>
<td>124.41</td>
</tr>
<tr>
<td>towards the organization</td>
<td>81.50</td>
<td>115.29</td>
<td>122.40</td>
</tr>
<tr>
<td>Entrepreneurial Empowerment</td>
<td>89.75</td>
<td>111.05</td>
<td>124.12</td>
</tr>
</tbody>
</table>

Source: Primary data
** Significant at 1% level.

The above table describes the Kruskal Wallis H test for the significant difference between the income level from other sources and the business performance of the entrepreneurs. As the p values of the influencing factors such as business policies (.000), customer relationships (.000), supplier's relationships (.002), sole proprietor's views towards the organization (.002) and the entrepreneurial empowerment (.007) are lower than the .001, the alternate hypothesis is accepted at 1% level of significance. So, it has been inferred that income level from other sources has a significant differences with that of the factors influencing the business performance of the sole proprietors at 1% significance. The p value of business performance (.028) is lower than .005, the alternate hypothesis is accepted at 5% significance. Hence, it could be concluded that income level is significantly differed with the business performance of the sole proprietors. Depending on the mean score, the sole proprietors earning an annual income of above Rs. 10 lakhs, the business performance is higher as they has the better mean score of 124.12 value, this is because, the predictors has high mean values such as business policies=130.40 mean, customer relations=122.81 mean, supplier relations=128.22, sole proprietor's views towards the organization=124.41 mean and entrepreneurial empowerment=122.40 mean. On the other hand, the sole proprietors earning income less than Rs.5 lakhs has the low business performance with a mean of 89.75 mean as their influencers are having low mean scores such as business policies=75.91 mean, customer relations=82.56 mean, supplier relations=82.41 mean, sole proprietor's views towards the business= 78.72 mean, entrepreneurial empowerment=81.50 mean.

\(H_{0}^{+}: \text{Entrepreneurial empowerment has a significant relationship with the business performance.}\)
Table 8: Pearson Correlation for the significant relationship between the influencers and the business performance

<table>
<thead>
<tr>
<th>Factors</th>
<th>Business policies</th>
<th>Customer relationships</th>
<th>Supplier's relationships</th>
<th>Sole proprietor’s views towards the organization</th>
<th>Entrepreneurial Empowerment</th>
<th>Business performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business policies</strong></td>
<td>Pearson Correlation</td>
<td>1</td>
<td>.199</td>
<td>-.099</td>
<td>.028</td>
<td>-.079</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>.005</td>
<td>.162</td>
<td>.693</td>
<td>.263</td>
<td>.616</td>
</tr>
<tr>
<td>N</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>Customer relationships</strong></td>
<td>Pearson Correlation</td>
<td>.199</td>
<td>1</td>
<td>.084</td>
<td>-.020</td>
<td>.211</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>.005</td>
<td>.235</td>
<td>.781</td>
<td>.003</td>
<td>.463</td>
</tr>
<tr>
<td>N</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>Supplier’s relationships</strong></td>
<td>Pearson Correlation</td>
<td>-.099</td>
<td>.084</td>
<td>1</td>
<td>.179</td>
<td>.030</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>.162</td>
<td>.235</td>
<td>.011</td>
<td>.669</td>
<td>.980</td>
</tr>
<tr>
<td>N</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>Sole proprietor’s views towards the organization</strong></td>
<td>Pearson Correlation</td>
<td>.028</td>
<td>-.020</td>
<td>.179</td>
<td>1</td>
<td>.094</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>.693</td>
<td>.781</td>
<td>.011</td>
<td>.186</td>
<td>.507</td>
</tr>
<tr>
<td>N</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>Entrepreneurial Empowerment</strong></td>
<td>Pearson Correlation</td>
<td>-.079</td>
<td>.211</td>
<td>.030</td>
<td>.094</td>
<td>1</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>.263</td>
<td>.003</td>
<td>.669</td>
<td>.186</td>
<td>.016</td>
</tr>
<tr>
<td>N</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>Business performance</strong></td>
<td>Pearson Correlation</td>
<td>-.036</td>
<td>-.052</td>
<td>-.002</td>
<td>.047</td>
<td>.170</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>.616</td>
<td>.463</td>
<td>.980</td>
<td>.507</td>
<td>.016</td>
</tr>
<tr>
<td>N</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

Source: Primary data
Note: 1. ** indicates significant at 1% level.
2. * indicates significant at 5% level.

The above table clearly describes the Pearson correlation for the significant difference among the influencers and the business performance. Considering the business policies, it is weak positively and significantly correlated with the customer relationships at .199 coefficients at 5% level, then weak negative and insignificantly with the supplier's relationships at -.099 coefficients, with the sole proprietors' views towards the organization weak positively and insignificantly at .028 coefficients, then negatively with the entrepreneurial empowerment at -.079 coefficients and weak negatively with the business performance at -.036 coefficients. Taking into account, the customer relationships factor, it is weak positively associated with supplier's relationships at .084 coefficients, then inversely with the sole proprietor's views towards the organization at -.020 coefficients, weak positively and significantly associated with the entrepreneurial empowerment at .211 coefficients by 1% level of significance and negatively with the business performance at -.052 coefficients. Supplier's relationships is negatively and significantly associated with
the sole proprietor's views towards the organization at .179 coefficients, weak positively affiliated with the entrepreneurial empowerment at .094 coefficients and inversely connected with the business performance at .002 coefficients. Sole proprietor's views towards the organization are associated with the entrepreneurial empowerment at .094 coefficients and weak positively with the business performance at .047 coefficients. Then finally, the entrepreneurial empowerment is weak positively intercorrelated with business performance at .170 coefficients. Since, the p value of entrepreneurial empowerment i.e., .016 is lesser than .005, the null hypothesis is rejected at 5% level of significance. Henceforth, it could be stated that entrepreneurial empowerment has a significant relationship with the business performance.

Results of data analysis and key findings of the study

The study identified that the personal and socio-economic constructs such as the experience, number of dependents and income level from other sources has a significant difference with that of the business performance of the sole proprietors in Puducherry. On the other hand, the study also found that the factors such as the age group and the number of children have no significant difference with the performance of the business among the respondents. So, leaving these constructs apart, considering those having relationship with the professional performance of the businesspersons, it has been found that the workers having above 15 years of experience, with 2 dependents and having more than Rs. 10 lakhs as the income from other sources are having more level of business performance. The study also identified that there is a significant relationship between the entrepreneurial empowerment and the business performance of the sole proprietors. On the other hand, it has also been revealed that the employees having experience from 10-15 years in running the businesses, with above 5 dependents and earning less than Rs. 5 lakhs per month from other sources have low business performance.

Conclusions and recommendations

Dependents care is the major factor responsible for the low business performance of the sole proprietors. As the sole proprietors are the key intermediaries for delivering the finished goods of huge manufacturers to the consumers, it becomes quintessential to improve the business performance of the sole proprietors. Therefore, it is a matter of economic concern to take care. So, ultimately the state should carry on the responsibility on its shoulders to take of this issue. Although the state, is already providing various subsidies and credit facilities to them by their various schemes, but, as per the study it has been identified that these schemes are found to be insufficient for the businesspersons for improving their businesses. Further as the income from other sources are utilized for the dependents (namely children, spouse and elderly parents) care with regard to their health constraint and the educational expenditure, they could not invest in the business anymore. So, to meet out the investment purposes, they are out of money.

Henceforth, it is the responsibility of the state to bring necessary and advanced health infrastructure facilities for free in study area as compared to that of other metro areas. Since, for advanced treatment, the hospitals in metro cities are being preferred by the respondents for their improved treatments. So, the state should take care to implement the advanced health facilities in this regard. In addition to this, the government also should take necessary steps to monitor the fees structure of the schools, that they are collecting fees within the stipulated limit as specified by the government. Care must be taken to improve the quality of the education provided in the public schools, as a part of the wards of the respondents are studying in both public and private schools. By improving the health facilities for free without any compromise on the quality and through enhancing the quality of the education, the health of the dependents and the children's education issues could be easily sorted out. In turn, the respondents would utilize the income from other sources for the up gradation and the progress of their business. So, as a result, the performance of the business arises.

Scope for further research

Since, the business performance of the sole proprietors i.e., the small businesses alone has been studied by the researcher. It would be better if comparative study has been carried out among the small scale and with that of the large scale businesses. So, that the level of performance of the entire commercial sector on the study area as a whole could be easily identified.

References


SCMS Journal of Indian Management

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 modify 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.
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 E-mail: editor@scmsgroup.org Website: www.scms.edu.in
Journal Website : 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 Printings, 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

<table>
<thead>
<tr>
<th>Subscription Rates</th>
<th>1 Year</th>
<th>2 Years</th>
<th>Per Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000 ($100)</td>
<td>3600 ($150)</td>
<td>500 ($30)</td>
</tr>
</tbody>
</table>

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 , E-mail: editor@scmsgroup.org
PGDM OF SCMS COCHIN SCHOOL OF BUSINESS

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 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.

Dewang Mehta National Award for excellence in

♦ 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>