



# THE INDIAN JOURNAL OF COMMERCE

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# **The Indian Journal of Commerce**

## ***A Quarterly Refereed Journal & UGC - CARE Listed Journal***

**Aims and Objectives :** The Indian Journal of Commerce started in 1947, is the quarterly publication of the All India Commerce, Association to disseminate knowledge and information in the area of trade, commerce, business and management practices. The Journal focusses on theoretical, applied and interdisciplinary research in commerce, business studies and management. It provides a forum for debate and deliberations of academics, Industries and practitioners.

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# Does Crypto and Stock Markets Reveal Coupling and Decoupling Effects : Evidence based on NASDAQ, SENSEX, and CMC Crypto 200 Indices

MONI M, BIJU A V, RAJU G AND SNEHITH JACOB KODIYATT

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**Abstract :** *The study explores the hedging opportunities among the Crypto market and stock market by using the CMC Crypto 200 Index (CMC200) with the S&P BSE Sensex and the NASDAQ. The dataset was extracted from Bloomberg, extending from 15<sup>th</sup> January 2019 to 15<sup>th</sup> January 2022. We employed the Granger causality test and ARDL model to determine the linkages between the crypto market and the stock markets. The essential finding is that though the BSE Sensex is devoid of having an effect on the crypto market, NASDAQ is seen to have causal effects on the crypto market. However, no causal impact of the cryptocurrency market is visible over both the markets under study. Further, through ARDL modeling, we have identified that the American stock market had both short-run and long-run relationships with the crypto market, but the Indian stock market didn't have any severe relationship with the crypto market. This study contributes to a better understanding of the cryptocurrency market in comparison to traditional financial assets, thereby assisting investors in making superior investment choices. The result of the study indicates a strong relationship exists between the crypto market and the American stock market, which will help the investors in the prediction and decision-making process.*

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**Keywords :** Cryptocurrencies, Crypto Market, Indian Stock Market, American Stock Market, Granger Causality, ARDL.

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## 1. Introduction

Bitcoin is regarded as the father of cryptocurrencies and has been traveling through a downfacing trend in the past two years after reaching its all-time high of USD 60,000, so the question which arises here is whether bitcoin is being manipulated or is correlated with any other factors. The Ether currency's two years of capital appreciation vanished and were wiped out in one single day. Bitcoin also holds the same trend, however; the risk of legality and recognition is still under consideration by legal authorities around the world, and this risk will be eradicated in the future as crypto-currencies derive their legality from their real intrinsic value, multi-economic usefulness and not by law as in the case of fiat money currency. Interestingly, we should also put the fact that bitcoin, as a first-generation cryptocurrency, has a substantial influence on other cryptocurrencies, which was advocated by (Antonakakis et al., 2019).

So the question which arises is how long the crypto storm will prevail? Investors all over the world are panicking about this market condition under ambiguity for a reason behind such a trend. Such a downfall has given rise to various criticisms of the market, including the allegation that a crypto market is being regarded as a Ponzi scheme. Despite the popularity and high trading volume compared to past years, the prices of cryptocurrency, including bitcoin, have been spiraling down. Originating in the offline world 150 years ago, Ponzi schemes have since migrated to the digital world, approaching first the Web and, more recently, hanging over cryptocurrencies like Bitcoin. Smart contract platforms like Ethereum have provided a new opportunity for scammers, who now have the possibility of creating "trustworthy" frauds that still make users lose money. Still, they at least are guaranteed to execute "correctly". (Bartoletti et al., 2020) Have observed that, in the first three years of the life of Ethereum, there hve been many experiments to implement Ponzi schemes as smart contracts.

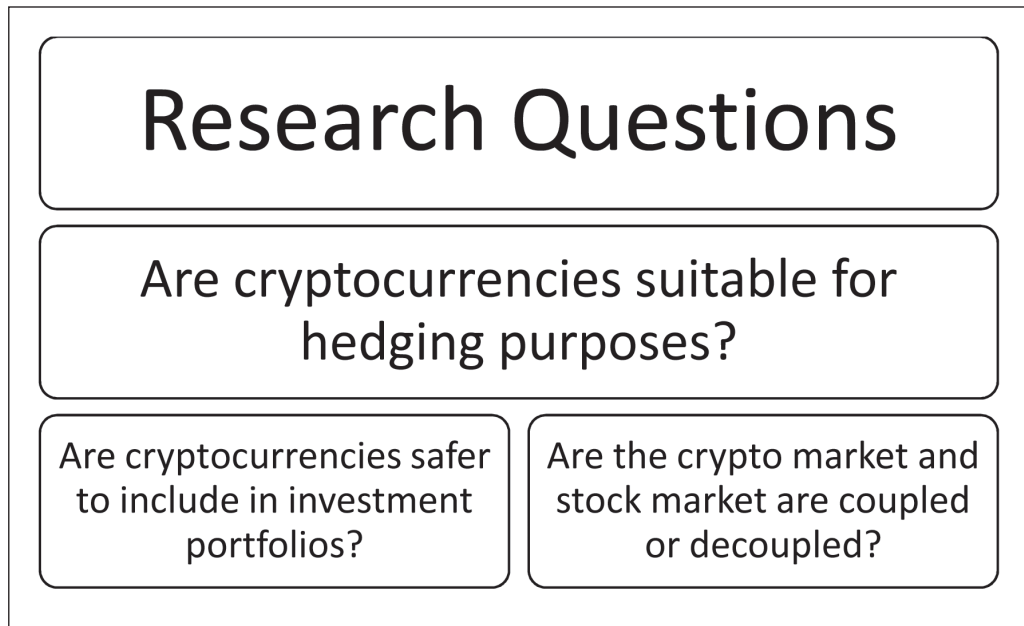
Glaser et al. (2014) aver that the crypto market has decoupled with the stock market, i.e., moving in an opposite direction. This meant investors could hedge the risk of losses using both the market's ups and downs. India currently has the highest number of cryptocurrency owners in the world at Over 10 Crore<sup>1</sup>, and the USA is in the second position according to the study report of Broker Chooser (Chadha, 2021). Retail and institutional investors have piled into new and old crypto assets, fueling the total cryptocurrency market capitalization to grow 185%, from \$773 billion to \$2.2 trillion. As a result of the recent development of cryptocurrencies as a new class of financial assets, there is now a unique

chance to research various undiscovered features of cryptocurrencies. In light of this surge of crypto-assets into the financial system, we evaluate the relationship between the Indian and American stock markets with the Cryptocurrency market. So, the study depicts whether NASDAQ and NIFTY correlate with the CMC200 index. So, this particular study contributes to the relationship that primary market indices of the US and India share with the cryptocurrency market. Such a study will help in decoding whether there is any hedging opportunity available to stock market investors. Similarly, Wang et al. (2019) have already quoted that the cryptocurrency market is a haven compared to stock indices; however, hedging opportunities are more visible in developed markets, which needs further evaluation between developed and emerging markets.

The researchgap identified for the particular study is the lack of studies that point out the criticisms behind investing in cryptocurrencies despite crypto markets plummeting in the recent past. However, authors are hesitant to project the trials and tribulations involved in the cryptocurrency market because of the popularity it has gained among millennials. This provides a vacuum of information on whether cryptocurrency is an appropriate asset class for hedging against the stock market and vice versa. Furthermore, it is to be proved whether it is beneficial or detrimental to include cryptocurrency in the asset portfolio. Adding to this, the study also argues that there is no effect coupling between the crypto and stock markets.

Moreover, the relationship between the cryptocurrency market and the stock market can be examined in two aspects. If a positive relationship is proven among the markets, it could be advocated that the market is efficient in its functioning. However, the scope of hedging is very minimal in such a market condition. The scope of hedging only comes into play when there is a negative relationship among the markets (Thampanya et al., 2020). Studying such an impact is essential for policymakers, academics, and investors. On one side, if the effects of the cryptocurrency market are buoyant, therefore the virtual money markets may be considered as a complement to the stock market. On the other hand, a zero-correlated market will restrict the scope for any hedging among the markets. We here have chosen India as a representation of an emerging market and the US market as a representation of a developed market and to evaluate the study here, answers to the question whether there is any hedging opportunities among the Crypto market and stock market, by using the CMC Crypto 200 Index (CMC200) with the S&P BSE Sensex and the NASDAQ by employing the Granger

causality test and ARDL model to determine the linkages between the crypto market and the stock markets of India & US. Thus, the research questions for this study could be summed up diagrammatically, as depicted below in the figure.



Our study is structured as follows; section 1 deals with a brief introduction to the study, section 2 deals with a review of the literature, section 3 deals with the data and methodology used, section 4 deals with the result, and section 5 deals with the conclusion and policy implication.

## **2.1. Review of Literature**

An extensive number of studies were conducted to identify the factors which influence cryptos (Kapar & Olmo, 2021); (Hachicha&Hachicha, 2021): (Corbet et al., 2018); (Karamcheti et al., 2018); (Das et al., 2020) and (Vidal-Tomas et al., 2019). As a result, the presence of new types of cryptocurrencies in recent years has resulted in a rapid expansion in the market size. Some studies have looked into the characteristics of cryptocurrencies, such as returns and volatility (Omane-Adjepong et al., 2019); Bouri et al., (2019) studied the herding behavior in the crypto market, diversification of cryptos through portfolios (W. Y. Liu, 2019), volatility of cryptocurrencies (J. N. Liu & Serletis, 2019), market efficiency of cryptos (Hu et al., 2019), trust in blockchain (Rehman et al., 2020), etc.



Recently, a segment of cryptocurrency literature has concentrated on stylized facts and technical features of cryptocurrencies. Most of them are related to the volatility of cryptocurrencies (Köchling et al., 2020); (Katsiampa, 2017); (Katsiampa, 2019) and (Miglietti et al., 2020)). Further, many studies have come up with macro-economic factors and their influence on the price of cryptos (Karamcheti et al., 2018); (Mudassir et al., 2020); (Corbet et al., 2020) and (Pyo & Lee, 2020)).

## **2.2. Factors Influencing the Price of Cryptocurrencies**

There are a large number of factors that influence the price of cryptocurrencies. Aloosh & Ouzan, (2020) identified that psychological factors influence the price of cryptos. Moreover, (Philippas et al., 2019) indicated that Bitcoin prices are partially driven by momentum in media attention on social networks, justifying a sentimental appetite for information demand. Goczek & Skliarov, (2019) found evidence that the price of cryptocurrency is getting influenced by popularity. Moreover, sentimental news is considered to have an impact on crypto pricing (Rognone et al., 2020).

According to Lyócsa et al., (2020), news relating to macroeconomic factors impacts crypto prices. Bitcoin returns are more sensitive to Economic Policy Uncertainty (EPU) in the United States, China, and Japan (Shaikh, 2020). Attempted to evaluate the macroeconomic variables impacted by the cryptocurrency market by indicating that Bitcoin prices affect money supply and share dynamic inter-shock with CPI, Economic Policy Uncertainty (EPU), and money supply. Specifically, the money supply and EPU negatively affect Bitcoin prices. CPI positively affects Bitcoin prices in the shortterm, which supports the role of Bitcoin as a hedging asset.

In continuation, as far as the US markets are concerned, (Kumar & Ajaz, 2022) revealed that the FED rate and mining difficulty has a long-run positive impact on Bitcoin prices, whereas Altcoins are found to have a long-run negative impact. De la Horra et al. (2019) evaluated that Bitcoin behaves as a speculative asset in the short term. For a long time, however, speculation does not seem to influence demand for Bitcoin. Instead, the market might be driven by expectations regarding Bitcoin's future utility as a medium of exchange.

## **2.3. Linkages of the Crypto market and Stock market**

Bards & Czudaj, (2021) identified that both the crypto market and stock market have a different reactions to different factors.. Cryptocurrencies have been found

to be statistically negligible predictors of current Asian financial markets (Handika et al., 2019). Malladi & Dheeriyaa, (2021) discovered that the returns of global stock markets have no direct influence on Bitcoin returns. Furthermore, Gil-Alana et al., (2020a) found no cointegration between selected cryptocurrencies and the stock market. A number of papers have also examined the possibility of cryptocurrencies, most notably Bitcoin, operating as safe havens or hedges (Corbet et al., 2018).

Cryptocurrency is a hot topic, a large number of studies relating to the various aspects of cryptocurrencies are under investigation. Zieba et al., (2019), however, indicated that the findings obtained for Bitcoin should not be generalized to the entire cryptocurrency market. In addition to this, he checked the spillover effects of Indian and American stock markets on the crypto market. From the review, it is clear that many aspects relating to different cryptos have been studied, but no one considered the CMC Crypto 200 Index (CMC 200) for representing the crypto market.. Sami & Abdallah, (2020) showed that there is a significant relationship between the cryptocurrency market and the stock market performance in the MENA region. On the one hand, for the Gulf countries that claim full obedience to the Islamic Sharia rules, each 1% increase in the cryptocurrency returns reduces the stock market performance by 0.15%. On the other hand, for the non-Gulf (other MENA) countries that have flexibility in applying the Islamic Sharia rules or do not follow it, the stock market performance increases by 0.13%, for each 1% increase in the cryptocurrency returns.

Wang et al., (2022) studied asymmetric contagion effects between stock and cryptocurrency markets. They also find that the lower tail dependences are more significant than the upper ones. Caferra & Vidal-Tomás, (2021) examined the behaviour of cryptocurrencies and stock markets during the COVID-19 pandemic through the wavelet coherence approach and Markov switching autoregressive model. Their results showed a financial contagion in March, since both cryptocurrency and stock prices fell steeply. (Susana et al., 2020) revealed that herding was evident among all the ten crypto-currencies in normal market conditions of the entire sample period but not during market upswing or downswing.

Gil-Alana et al., (2020b) Along the same lines, tested for cointegration between the cryptocurrencies and the stock market indices, they find evidence of no cointegration, which implies that the cryptocurrencies are decoupled from the mainstream financial and economic assets. Speculation and financial crises have been endemic throughout human history (Reinhart and Rogoff, 2009). Bubbles

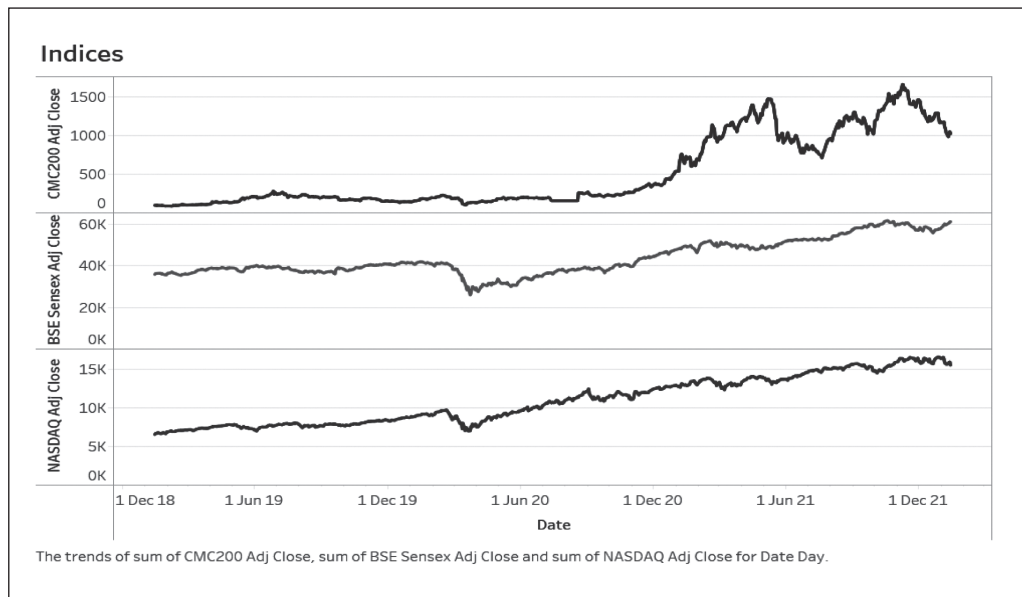
typically occur when the price of an asset grows rapidly and does so in a manner far removed from realistic assessments of the asset’s intrinsic value

### 3. Data and Research Method

This study uses the daily data on adjusted closing prices of the S&P BSE 500 Index, NASDAQ and CMC 200 Index. While the S&P 500 Index and NASDAQ represent the stock markets of India and USA respectively, the CMC Crypto 200 Index is representative of the cryptocurrency market. This Index tracks the price movements of a portfolio of the top 200 cryptocurrencies by market capitalization. The data extends from 14<sup>th</sup> January 2019 to 13<sup>th</sup> January 2022 with data retrieved from the Yahoo finance database. The data period was chosen as it is the earliest data point pertaining to the CMC 200 Index, thus a better data window for the study.

### Descriptive Statistics

**Figure-1 : Adjusted Closing Price of Indices**



Source : Authors Calculation.

Note : Figure-1 shows the Adjusted closing prices of selected indices, indicating a trend which means non-stationary data.

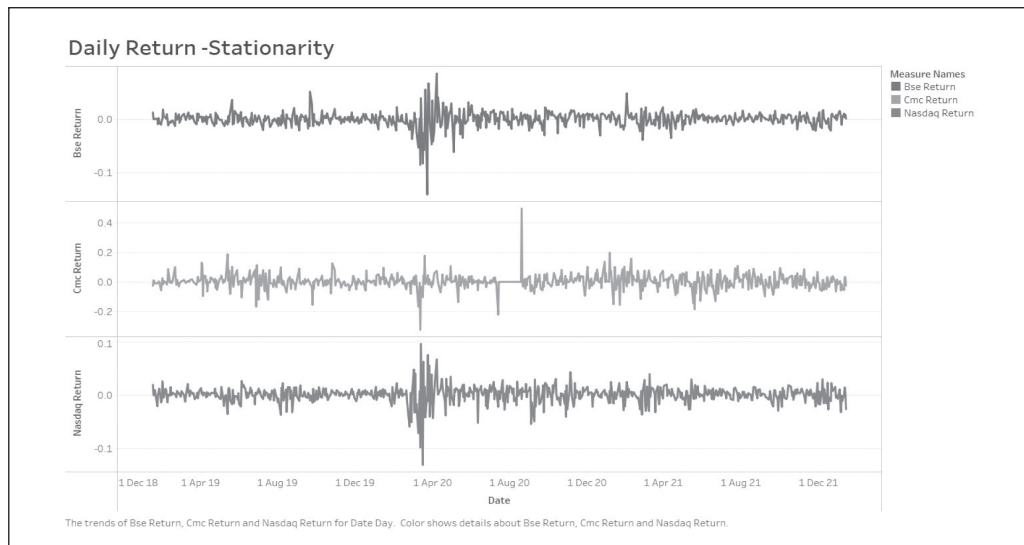
### 3.1. Daily Log Return

For ensuring stationarity, the daily returns was calculated from adjusted closing price. The study used natural log return methodology for calculating daily returns (Mahendra et al., 2021).

$$R_{ti} = \ln (P_{ti}/P_{t-1})$$

In this equation,  $R_{ti}$  represents the daily return of price index  $I$ ,  $P_t$  represents the adjusted closing value of price index at time  $t$ , and  $P_{t-1}$  represents the index value at time  $t-1$ .

**Figure-2 : Daily Log Return**



*Source : Authors Calculation.*

Note : The figure shows the calculated daily log return. From the graph itself we can easily understand that the data is stationary.

### 3.2. Data Stationarity

The stationarity of time series data may be evaluated using a number of different methods. In addition to Unit Root Tests, the Augmented Dickey-Fuller (ADF) test was used to evaluate data stationarity (Mia & Rahman, 2019).

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta m_i = 1 \Sigma m_i = 1 \alpha_i \Delta Y_{t-i} + \epsilon_t$$

The fact that the null hypothesis was rejected suggests that the data are steady. The test rejects the null hypothesis when the p-value is less than 0.05 and the test result has robust negative ADF test statistics.

### 3.3. Pairwise Granger Causality Test:

The Granger causality test is used to identify causality between variables(Wei, 2018).

$$Y_t = \alpha_0 + \alpha_1 y_{t-1} + \dots + \alpha_i y_{t-i} + \beta_1 x_{t-1} + \dots + \beta_i x_t + \dots + \beta_i x_{t-i} + \varepsilon$$

$$X_t = \alpha_0 + \alpha_1 x_{t-1} + \dots + \alpha_i x_{t-i} + \beta_1 y_{t-1} + \dots + \beta_i y_t + \dots + \beta_i y_{t-i} + \varepsilon$$

Here X and Y are variables, t denotes time, and  $\varepsilon$  indicates an error. It investigates causation from X to Y and Y to X. The test can be applied to all possible pairs (X, Y) of the series. The null hypothesis is that X does not Granger-cause Y in the first regression, and Y does not Granger-cause X later. Akaike information criterion (AIC) was considered to determine the optimum lag length (Sifat et al., 2019).

### 3.4. ARDL (Autoregressive Distributed Lag) Modeling

An ARDL is a least-squares (LS) regression that includes lags of the dependent variable and explanatory variables (Guan et al., 2015). The ARDL model can be specified as follows :

$$y_t = \alpha + \sum_{i=1}^p \gamma_i y_{t-i} + \sum_{j=1}^k \sum_{i=0}^q X'_{j,i-1} \beta_{j,i} + \varepsilon_j$$

In this equation  $y_t$  is the dependent variable,  $y_{t-i}$  is the one lagged value of the dependent variable, and current and past values of independent variables are represented by  $X_j$ , where the number of lags of past values of the dependent variable is represented by  $p$ ; and the number of lags of current and past values of independent variables is represented by  $q$ ; Some of the model's explanatory variables may ignore lagged terms ( $q_j = 0$ ). These variables are referred to as fixed or static regressors.

### 3.5. Bounds Test for Cointegration- Long-run Relationship

(Pesaran et al., 2001) says an ARDL model can estimate the dynamic connection between the dependent variable and the explanatory variables, and it may be transformed into a long-run representation as :

$$\theta_j = \sum_{i=1}^J \hat{\beta}_{j,i} / 1 - \sum_{i=1}^P \gamma_i$$

In this,  $\theta_j$  Calculates long-run coefficients, which indicate the dependent variable's long-run response to changes in explanatory variables.

## 4. Empirical Results

### 4.1. Data Stationarity

The Augmented Dickey-Fuller test result is shown in the table. We may reject the null hypothesis since the time series data for all three indices had a p-value that was less than 0.05. Additionally, we discovered a strong negative ADF test statistic with values of 1%, 5%, and 10% significance levels, supporting the rejection of the null hypothesis and demonstrating that the time series data is stationary and free of unit roots. (Miglietti et al., 2020).

**Table-1 : Data Stationarity**

Unit Root Test — Augmented Dickey–Fuller Test					
Variable	P-value	ADF test statistics	1% significance level	5% significance level	10% significance level
CMC Crypto200	0	-25.9974	-3.43919	-2.86533	-2.56885
BSE Sensex	0	-8.8468	-3.43927	-2.86537	-2.56886
NASDAQ	0	-18.3461	-3.43921	-2.86534	-2.56885

Source : Authors Calculation.

Note : The table displays the chosen variable's stationarity properties as determined by the ADF Test.

### 4.2. Descriptive Statistics- Risk Return Characteristics

The S&P BSE 500 Index, NASDAQ, and CMC 200 Index return and risk characteristics are well shown by descriptive data. The return and risk characteristics of the variables are explained by their mean and standard deviation. (Mahendra et al., 2021).

**Table-2 : Risk Return Characteristics- Descriptive Statistics**

	<b>BSE SENSEX</b>	<b>CMC CRYPTO200</b>	<b>NASDAQ</b>
Mean	0.000741	0.003248	0.001195
Median	0.001412	0.001599	0.002159
Maximum	0.085947	0.496167	0.095966
Minimum	-0.141017	-0.324131	-0.130032
Std. Dev.	0.014265	0.050169	0.015972
Skewness	-1.660008	0.715259	-0.992578
Kurtosis	23.0661	19.67885	14.7592

Source : Authors Calculation.

Note : The return and risk characteristics of all three variables are included in the table.

Compared to the American and Indian stock markets, the daily mean returns and risk are greater for the cryptocurrency market.

### 4.3. Correlation

The Pearson correlation coefficient was used to analyse the link between the returns of various stock indexes. In time-series data, it gauges how much two variables change relative to one another (Pollet & Wilson, 2010). The co-movement between the daily returns of the BSE SENSEX, NASDAQ, and CMC Crypto 200 Index is explained in this case by the Pearson correlation.

**Table-3 : Correlation**

<b>Probability</b>	<b>BSE_RETURN</b>	<b>CMC_RETURN</b>	<b>NASDAQ_RETURN</b>
BSE_RETURN	1		
	—		
CMC_RETURN	0.114801	1	
	0.002	—	
NASDAQ_RETURN	0.297688	0.225269	1
	0	0	—

Source : Authors Calculation.

Note : The table shows the Correlation between three variables.

From table-3, it is clear that there is a statistically significant correlation between the crypto market and both stock markets under study, but the degree is low. Further advanced analysis is needed to understand the relationship with direction.

#### 4.4. Pair-wise Granger Causality

The pair-wise Granger causality test establishes if the return of the BSE SENSEX and the NASDAQ Granger causes the return of the CMC Crypto 200 and vice versa. (Granger, 1969). For conducting the Granger test, we had first to establish lag length criteria ((Sifat et al., 2019). AIC (Akaike Information Criteria) was used to calculate the ideal lag time by using VAR, using examples from prior research as a guide.

**Table-4 : Lag Length Criteria**

Lag.	Log	LR	FPE	AIC	SC	HQ
0	5130.993	NA	1.16E-10	-14.36413	-14.34492	-14.35671
1	5189.369	116.0965	1.01E-10	-14.50243	-14.42561*	-14.47276
2	5213.21	47.21629	9.69E-11	-14.54401	-14.40957	-14.49209*
3	5219.612	12.62405	9.76E-11	-14.53673	-14.34467	-14.46256
4	5226.737	13.98962	9.81E-11	-14.53148	-14.28181	-14.43505
5	5255.023	55.30588	9.29E-11	-14.5855	-14.27821	-14.46682
6	5262.945	15.42125	9.32E-11	-14.58248	-14.21758	-14.44155
7	5273.344	20.15810*	9.29e-11*	-14.58640*	-14.16388	-14.42322
8	5277.24	7.51913	9.42E-11	-14.5721	-14.09197	-14.38667

Source : Authors Calculation.

Note: Displays the optimum Lag length according to AIC.

According to the Akaike Information Requirement, we have verified the lag length criteria in the VAR model. Lag 7 is used for the Granger causality test based on AIC.



**Table-5 : Granger Causality Test**

Variables	Null Hypothesis	Observation	F-Statistic	Prob.
CMC Crypto 200 and BSE Sensex	BSE_RETURN does not Granger Cause CMC_RETURN	715	0.76161	0.620
	CMC_RETURN does not Granger Cause BSE_RETURN	715	2.35903	0.022
NASDAQ and CMC Crypto 200	NASDAQ_RETURN does not Granger Cause CMC_RETURN	715	2.20945	0.032
	CMC_RETURN does not Granger Cause NASDAQ_RETURN	715	1.22161	0.288

Source : Authors Calculation.

Note : Illustrates the Granger causation between the stock market and the cryptocurrency market.

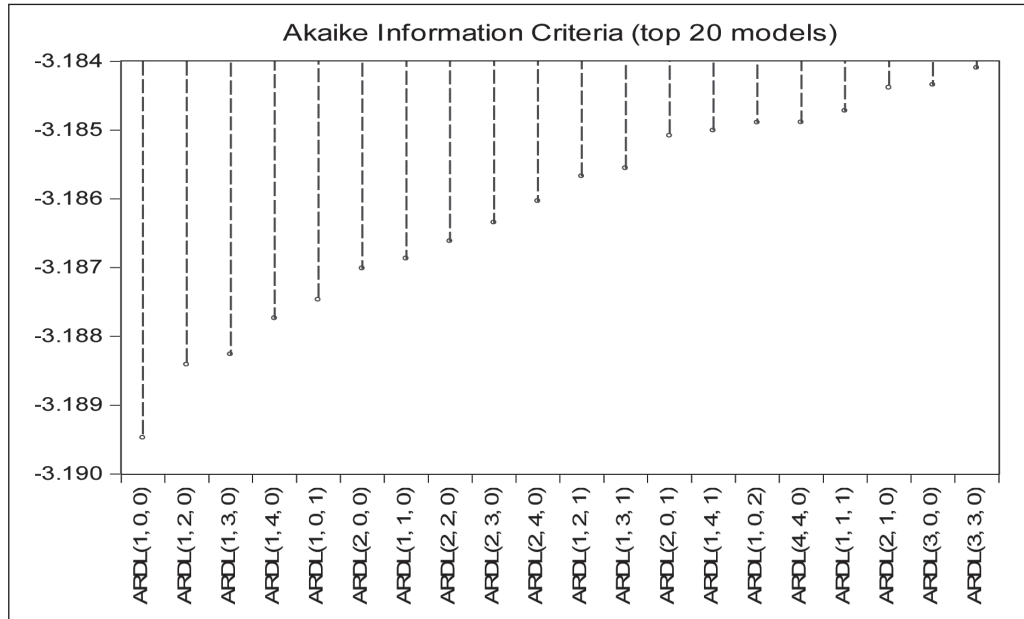
Table-5 shows that although the Indian stock market does not directly cause crypto market growth, Indian stock market growth does drive crypto market growth. The Crypto market doesn't Granger cause the American stock market, but the American stock market granger causes the crypto market in the situation of the two markets. It implies that both the American and the cryptocurrency markets have an impact on the Indian stock market.

#### 4.5. ARDL Model

The model selection criteria are based on AIC, and the lag length criteria are set to automatic. (Tian & Ma, 2010). There are 100 models that were assessed for this. BSE and NASDAQ returns are considered independent, but CMC returns are considered dependent.

#### 4.6. Short Run Relationship

Given that the t-statistic is more than 2 and its p-value is less than 0.05, it is clear from the table that the NASDAQ return has a significant impact on the cryptocurrency market. The significance of the other coefficients is minimal. It suggests that the short-term association between the American stock market and the cryptocurrency market is statistically significant.

**Figure-3 : ARDL Model Selection Criteria**

Source : Authors' Calculation.

Note : Displays the AIC-based model selection criterion. Here are the top 20 models based on the analysis. The model with the highest AIC value among them is ARDL (1, 0, 0).

**Table-6 : ARDL – Co-efficients of Optimal Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
CMC RETURN(-1)	0.041952	0.036458	1.15072	0.2502
NASDAQ RETURN	0.673536	0.119853	5.619681	0
BSE RETURN	0.175564	0.134041	1.309783	0.1907
C	0.002236	0.00183	1.221575	0.2223

Source : Authors Calculation.

Note : Displays statistical properties of the selected ARDL model (1, 0, 0)

### 4.7. ARDL Equation

ARDL(1,0,0) is :  $CMC Rt = \alpha + \beta(1) * CMC Rt (-1) + \beta(2) * NASDAQ Rt + \beta(3) * BSE Rt + \epsilon_j$   
 $CMC Rt = 0.002236 + 0.041952 * CMC Rt (-1) + 0.67353 * NASDAQ Rt + 0.17556 * BSE Rt$

**Table-7 : Long-Run Relationship**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NASDAQ_RETURN	0.70303	0.130041	5.406199	0
BSE_RETURN	0.183252	0.139584	1.31284	0.1897
C	0.002334	0.001906	1.224119	0.2213

Source : Authors Calculation.

Note : The table shows the long-run relationship between variables in the model

**Table-8 : Bounds Test- Long Run Relationship**

ARDL Bounds Test	F-statistic	Critical Value Bounds		
		Significance	I0 Bound	I1 Bound
Null Hypothesis: No long-run relationships exist	225.1956	10%	3.17	4.14
		5%	3.79	4.85
		2.50%	4.41	5.52
		1%	5.15	6.36

Source : Authors Calculation.

Note : The table shows the statistical significance of the long-run relationship.

### 4.8. Long Run Relationship

Tables-7 and 8 demonstrate the statistical significance and long-term Correlation between variables in the model, respectively. From the table, it is clear that only NASDAQ has maintained a strong involvement in the bitcoin market throughout its history. The cryptocurrency market is unrelated to the Indian stock market in a significant way. Moreover, the results in Table 8 confirm the Correlation over the long run. When the F-statistic is outside of its normal range, it indicates a long-term correlation. The ARDL model found that the two markets had a high degree of association, with the former being an excellent proxy for the latter.

## 5. Conclusion and Policy Implications

### 5.1. Conclusion

The study has employed stationary data from the NASDAQ index, S&P BSE Sensex, and CMC Crypto 200 Index (CMC200). Both selected stock markets and the cryptocurrency market provide higher daily returns than the stock market, but the cryptocurrency market is also riskier. It is evident from the Granger causality test that the Indian stock market did not trigger the cryptocurrency market. However, the Indian stock market is growing because of the crypto market. It implies that, rather than the other way around, the cryptocurrency market influences the Indian stock market. There is only one direction of causality in the case of the American stock market: the American market Granger causesthe Crypto market, but the Crypto market does not Granger cause the American market.

Further, we've determined that the best model for forecasting the return of the cryptocurrency market is ARDL (1, 0, 0). We also deduced from the model that the American stock market and the cryptocurrency market were related throughout the long and short terms. There is no proof of a significant association between the Indian stock market and the cryptocurrency sector.

### 5.2. Policy Implications

The conclusions of this study might have an impact on regulators, market participants, and investors. The Indian stock market may be affected by price changes in the cryptocurrency market. Thus, market players should adjust their strategies appropriately. Furthermore, we have shown that the American stock market has a causal association with the cryptocurrency market in both the short and long terms. This will aid decision-making for market participants, including investors, market players, and regulators.

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## Footnotes

1. <https://brokerchooser.com/education/crypto/crypto-countries>



# The Behaviour of Idiosyncratic Volatility and its Relationship with Stock Returns in India

SARTAJ HUSSAIN AND PARVEZ AHMAD SHAH

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**Abstract :** *The classical portfolio theory argues that idiosyncratic volatility is diversifiable and hence, should not command any return to the investors who bear it. However, due to constraints in diversification and incomplete markets, many researchers have found evidence about the existence of a positive premium for idiosyncratic risk. The present study attempts measure idiosyncratic volatility of stocks using single factor market model. We use individual measures of idiosyncratic volatility to construct overall aggregate measure of idiosyncratic volatility following equally weighted index scheme. We test this aggregate measure of idiosyncratic volatility for presence of any trend using a simple linear trend model and observe a statistically significant downward trend in the idiosyncratic volatility in the Indian stock market. Further, we construct stock portfolio based on idiosyncratic volatility sort on monthly basis and find evidence of statistically significant idiosyncratic volatility effect in the Indian stock market. The study has vital implications for the investors and other stakeholders interested in the investment in stock market securities.*

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**Keywords :** Diversification, Idiosyncratic Volatility.

## Introduction:

Volatility is a broad measure of risk used for evaluation of performance of financial assets. A broader classification of the overall risk being faced by any financial asset can be made into two categories. Systematic risk which is common to all assets arises due to the factors like, inflation, currency fluctuations, business cycles etc., while as unsystematic risk which is asset- specific arises due to firm specific factors like, financial irregularities, failure of a product, employee strikes

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etc. The traditional theories of finance consider unsystematic or idiosyncratic volatility as unimportant, arguing that idiosyncratic risk gets diversified by having a portfolio of assets, and hence shouldn't matter while pricing of financial assets. However, in reality investors face various constraints to have a well-diversified portfolio which could be free of any idiosyncratic risk. Hence, it is argued that idiosyncratic risk can't be fully done away with and is being assumed by the investors and as such, should have incentive to the investors bearing it. Malkiel and Xu (2002) cite a number of reasons that constraint investor efforts to diversify. Among these, constraints faced by individual investors in pursuing diversification which includes problems of incomplete information, taxes, liquidity needs, imperfect divisibility of securities and restrictions on short sales etc., willingness among institutional investors to assume a considerable amount of idiosyncratic risk in their portfolios, inclination of brokerage houses to hold a handful of securities, compulsions among employees to have stock options that are linked to their retirement plans. Finally, majority of mutual and pension funds fail to hold a mean-variance efficient portfolio because they claim to create portfolios capitalizing on market anomalies. In view of these difficulties, when most market participants are unable to have liquid and diversified portfolios, examination of the role of idiosyncratic risk in asset pricing assumes a greater significance. Among the various asset pricing models, the pioneering Capital Asset Pricing Model (CAPM) developed by Sharpe (1964), Lintner (1965), and Black (1972) ignores the role of idiosyncratic volatility in pricing of securities. While on the other hand, theories of incomplete markets and under-diversification (Constantinides & Duffie, 1996; Levy, 1978; Merton, 1987) argue about a positive relationship between idiosyncratic volatility and expected stock returns and hence, set the basis for a possible premium for idiosyncratic risk. The present study is a preliminary attempt that aims to measure idiosyncratic volatility, examine its behaviour and also investigate possibility of the existence of idiosyncratic volatility effect in the Indian stock market.

### **Review of Literature:**

A surge in the idiosyncratic volatility is indicative of increase in cost of diversifying, as more number of stocks are needed to achieve a certain level of diversification. Hence, investors who are not able to adjust to such trends in idiosyncratic volatility cannot fully diversify and consequently, experience a deteriorating investment performance. Over time, researchers have examined the trending behaviour of idiosyncratic volatility with more such studies emphasising on developed and mature markets of west than developing countries like India. Campbell et al. (2001) found evidence of increased idiosyncratic volatility relative to market volatility in the US market during 1962–1997. Kearney and

Poti (2008) observe a rise in idiosyncratic volatility in European equity market during the period 1974-2004, however, unlike US, market risk is found trended upwards and correlations are not trended down. Bali, Cakici and Levy (2008) using a model free measure of idiosyncratic volatility observe an upward trend in average idiosyncratic volatility for the NASDAQ stocks with much stronger upward trend being pronounced in case smaller, lower-priced, and younger firms. They suggest that equally weighted measures are less sensitive to the small size effect. These research findings imply that cost of diversification has gone up with the rise in average idiosyncratic risk and it would now require increasingly more stocks to capture the benefit of diversification in the European markets than before.

Idiosyncratic volatility effect generally goes against the principle of diversification of the modern portfolio finance theory. Many researchers who argue about the incomplete markets and imperfect diversification have attempted to investigate compensation for bearing idiosyncratic risk. Drew and Veeraraghavan (2002) employing a model-free measure of idiosyncratic volatility found that high idiosyncratic volatility stocks generate superior returns in Asian markets of Hong Kong, India, Malaysia and the Philippines. Sehgal and Garg (2016) also found that high idiosyncratic volatility portfolios exhibited higher returns in countries like Brazil, Russia, India, Indonesia, South Korea, and South Africa. There are many studies that have found a positive relation between idiosyncratic volatility and stock returns. To cite a few Brockman et al. (2009), and Pukthuanthong-Le and Visaltanachoti (2009) report a positive relation between idiosyncratic volatility and stock returns. Garcia et.al. (2011) argue that economic sources of heterogeneity between firms, as diverse as they can be, are better reflected in an equally weighted measure, all other things being equal. Their findings further support that relation between equally-weighted measure of aggregate idiosyncratic volatility and the returns on the equally-weighted index is much stronger and stable across periods than for the market-cap weighted equivalents. Bali and Cakici (2008) demonstrate that the relation between idiosyncratic volatility and future stock returns is sensitive to the choices of data frequency, portfolio weighting schemes, breakpoint calculations and choice of screens in sample selection. With this context, we raise following important questions about the issue of idiosyncratic volatility :

1. How to measure idiosyncratic volatility?
2. What are the behavioural properties of such measure of idiosyncratic volatility?

3. Is idiosyncratic volatility stable over time?
4. Does there exist any idiosyncratic volatility effect in the Indian stock market?

### **Objective of the Study:**

Accordingly, the study aims to focus on the following objectives:

1. To measure idiosyncratic volatility of individual stocks.
2. To form an aggregate market wide measure of idiosyncratic volatility.
3. To analyse behaviour of aggregate measure of idiosyncratic volatility.
4. To investigate whether there is any return differentials among the stock portfolio sorted on the basis of idiosyncratic volatility.

### **Data and Methodology:**

Idiosyncratic volatility is not directly observable. Existing studies use different asset pricing models to capture idiosyncratic volatility from the residuals of such models. We attempt to capture idiosyncratic volatility from the residuals of the pioneering single factor market model using within month daily stock return data. We assume resulting residual error terms of individual stock month-wise regressions to be uncorrelated or independent of each other across time. We have used Nifty200 index constituents and found daily adjusted close price data in case of 175 stocks for our reference period of five years from 1<sup>st</sup> April 2013 to 31<sup>st</sup> March 2018 from Prowess database of CMIE. We consider only capital gain (loss) component of the stock returns and ignore any dividend income, since dividend yield on Indian companies has been historically found to be negligible. We chose constituents of the Nifty200 for our study as we believe that it is fairly representative of the overall market performance. We support our argument with the fact that Nifty200 index, according to National Stock Exchange (NSE) sources as on March 31<sup>st</sup> 2017, represented about 85% of the free float market capitalization of the stocks listed on NSE. Further, total traded value for the last six months ending March 2017, of all index constituents has been approximately 77.9% of the traded value of all stocks on NSE. Monthly implicit 91 Treasury bill yield has been obtained from the RBI database on Indian Economy. Instead of a readily available market proxy, we form our own measure of equally weighted market index from the sample stocks and use that as proxy of diversified market portfolio. Such a measure appears to perform better than counterpart variants in explaining variations in the individual sample stock returns.

For each month, we estimate the CAPM single factor model on within month daily stock returns of individual stocks.

$$r_{i,t} - r_{ft} = \alpha + \beta(r_{m,t} - r_{ft}) + \varepsilon_{it} \quad (1)$$

$r_{i,t}$  is the daily logarithmic return of the individual securities obtained by using following equation :

$$r_{i,t} = \ln\left(\frac{p_t}{p_{t-1}}\right) \quad (2)$$

$p_t$  is the price of the stock at the close of the day  $t$  and  $p_{t-1}$  is the price at close of the previous day  $t-1$ .  $r_{i,t} - r_{ft}$  is excess daily return on the stock  $i$  observed at time  $t$  and  $r_{m,t} - r_{ft}$  is the excess daily return on an equally weighted market portfolio observed at time  $t$ .  $r_{ft}$  is daily equivalent of the 91 day Treasury bill implicit yield used as proxy for risk-free rate.  $r_{m,t}$  is the daily logarithmic return on an equally weighted market portfolio that is constructed from the daily returns data of all the sample stocks used in the study through following equation :

$$r_{m,t} = \frac{1}{n} \sqrt{\sum_{i=1}^n r_{i,t}^2} \quad (3)$$

Where  $r_{i,t}$  is the daily logarithmic return on the stock  $i$  on day  $t$ . The idiosyncratic volatility of stocks is then obtained from the daily residuals of the model in Eq. 1 through :

$$ivol_{i,t} = \frac{1}{n-k} \sqrt{\sum_{i=1}^n (\varepsilon_{i,t})^2} \quad (4)$$

$\varepsilon_{i,t}$  is the daily within month residuals of the stock  $i$  at time  $t$ . The daily measures of individual month-wise idiosyncratic volatility are then scaled into a monthly measure by using following transformation :

$$ivol_{i,t} = \frac{1}{n-k} \sqrt{\sum_{i=1}^n (\varepsilon_{i,t})^2} \times \sqrt{D_t} \quad (5)$$

Where  $D_t$  is the actual number of trading days observed in each month. Finally, we aggregate individual idiosyncratic measures into a market wide idiosyncratic volatility measure by applying following equation :

$$agg\_ivol_t^{CAPM} = \frac{1}{N} \sqrt{\sum_{i=1}^{N_t} ivol_{i,t}} \quad (6)$$

Where,  $ivol_{i,t}$  is the single factor market model based monthly idiosyncratic volatility of the stock  $i$  observed at time  $t$  from the Nifty 200 index.

Next, we use semi-log growth model to test for any possible trend in our aggregate measure of idiosyncratic volatility. The following linear model is used to investigate presence of any trend in our aggregate measure of idiosyncratic volatility. This model uses aggregate measure of equally weighted idiosyncratic volatility as dependent variable and time in months as independent variable and  $\varepsilon_t$  is assumed to be mean zero, homoscedastic and uncorrelated across time.

$$agg\_ivol_t^{CAPM} = \alpha + \beta t + \varepsilon_t \quad (7)$$

Finally, we conduct a month-wise sort of the individual stock returns by their monthly idiosyncratic volatility and form quartile, quintile and decile portfolios to investigate the existence of any possible idiosyncratic volatility effect in the Indian Stock market. Standard t-test is used to test the hypothesis relating to presence of idiosyncratic volatility effect. The portfolios slicing are using different quantiles to check whether idiosyncratic volatility effect is sensitive to the portfolio size.

## Results :

We begin our analysis by transforming daily close prices into daily continuously compounded returns. We expect daily time series of returns to be stationary at their level. The daily close price series is generally found to follow non-stationary nature, however, daily returns that are first logarithmic difference of the prices have a stationary character. With these daily returns that are adjusted for daily risk free returns, we construct an equally weighted market index. This index is used as an explanatory variable in the next step where we conduct single factor market model based monthly regressions. Now, we run monthly regressions on each stock using within month daily data to obtain standard deviation of the residual. These daily standard deviations are then scaled to monthly measure

by apply each estimate with square root of actual trading days in a month. This forms our monthly measure of individual stock idiosyncratic volatility. To assess the behaviour of idiosyncratic volatility and investigate the existence of idiosyncratic volatility effect in the market, we need a broad measure of idiosyncratic volatility. To have such a measure, we sum up and average monthly individual stock idiosyncratic volatility measures of all stocks at each point in time.

Before moving towards the main analysis, we conduct a preliminary examination of the time series behaviour and properties of our two important variables of interest, i.e. monthly logarithmic returns of our market index proxy (equally weighted) and monthly aggregate idiosyncratic volatility (equally weighted). The summary of descriptive statistics and normality test of these two variables is given in Table-1 and Table-2 below :

**Table-1 : Summary of Descriptive Statistics**

<b>Time Series Variable</b>	<b>Mean</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>
Monthly market index returns (EW)	0.014334	0.018057	-0.093	0.14077
Monthly Idiosyncratic volatility (EW)	0.080517	0.080227	0.0636	0.1145
<b>Time Series Variable</b>	<b>Std. Dev.</b>	<b>C. V.</b>	<b>Skewness</b>	<b>Ex.Kurtosis</b>
Monthly market index returns (EW)	0.05017	3.5001	-0.0059	-0.1389
Monthly Idiosyncratic volatility (EW)	0.010069	0.12505	0.8796	1.4613

**Table-2 : NormalityTest results**

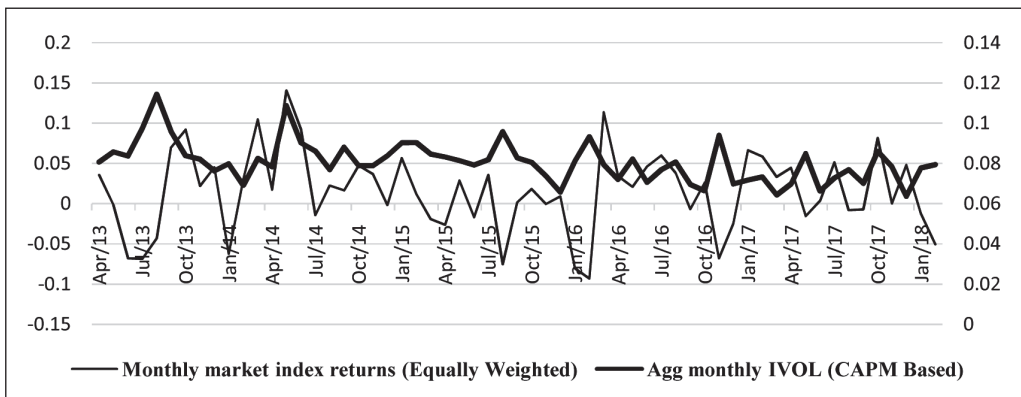
<b>Time Series Variable/ Type of test</b>	<b>Monthly market index returns (EW)</b>	<b>Aggregate monthly Idiosyncratic volatility (EW)</b>
Jarque-Bera test statistic	0.0485429	13.0753
p-value	0.976021	0.00144792

The results of descriptive statistics in Table-1 reveal that index returns have insignificant skewness and kurtosis and thus seem to be pretty symmetrically distributed, however, idiosyncratic volatility series exhibit some amount of positive skeweness and is highly peaked, hence, seems contradicting to a symmetrical normal distribution.

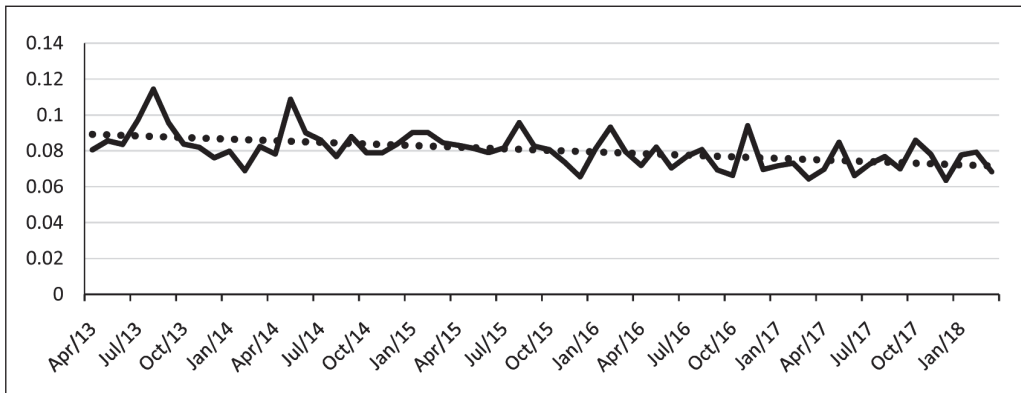
To confirm formally, whether the two series are normal, we also conduct a normality test whose results in the Table-2 clearly show evidence that as indicated by the descriptive statistics results, index returns are normally distributed, and while as idiosyncratic volatility is not.

In the Figure-1 below, we examine the movements in two variables, equally weighted monthly index returns and equally weighted monthly idiosyncratic volatility. The visual examination of the graphical plot clearly reveals an inverse relation between monthly returns and the idiosyncratic volatility which seems in quite agreement with the finance theory arguing a negative relation between returns and their associated volatility.

**Figure-1 : Behaviour of Equally Weighted Index Returns versus Equally Weighted Idiosyncratic Volatility**



**Figure-2 : Aggregate Monthly Idiosyncratic Volatility in the Indian Stock Market (Single Factor Market Model Based)**





In the Figure-2 above, we plot our aggregate monthly measure of idiosyncratic volatility against time. After examining the plot, there appears to be downward trend in the overall idiosyncratic volatility in the Indian stock market over the last five years.

In order to check whether the noticed trend is statistically significant or not, we apply linear trend model to our aggregate monthly measure of idiosyncratic volatility. The results of the linear trend model are given in the Table-3 below:

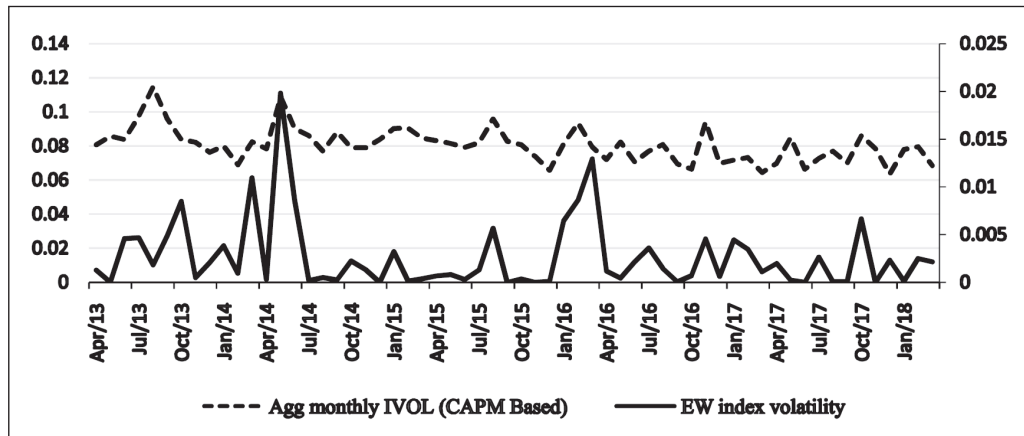
**Table-3 : Regression Results of Linear Time Trend Model**

$$[agg\_ivol_t = \alpha + \beta t + \varepsilon_t]$$

Description	Regression Results	
	Constant	Trend
Coefficient	0.089619	-0.0003
t-statistic	39.44888	-4.60757
p-value	1.36E-43	2.28E-05
R <sup>2</sup>	0.267951	
F-statistic (Prob.)	21.22971 (2.28E-05)	

From the figures given in the Table-3, we find that monthly aggregate measure of idiosyncratic volatility exhibits a statistically significant negative trend. A negative trend in the idiosyncratic volatility provides positive implications for those who pursue diversification while investing in financial securities. This implies benefits to the potential investors seeking elimination of idiosyncratic risk in their portfolio. Such a trend signals towards reduction in the number of stocks that might be needed to achieve diversification and control idiosyncratic risk.

Next, we plot our aggregate measure of monthly idiosyncratic volatility against overall market volatility obtained by squaring monthly returns of our equally weighted index. In the Figure-3 above, we observe that unlike idiosyncratic volatility, market volatility doesn't exhibit any trend over time, however, interestingly there is resemblance in the movements in idiosyncratic volatility and market volatility. These results are in line with the findings of Schwert (1989) who found no significant trend in the market volatility in US during 1859-1987. However, Campbell et.al. (2001) observe that US stock market has become more volatile over the period 1962-1997 but on firm level instead of a market of industry level. Such a trend movement in idiosyncratic volatility relative to market

**Figure-1 : Aggregate Idiosyncratic versus Overall Market Volatility**

volatility indicates that correlation among the individual stock returns and the explanatory power of market model have declined. Further, such a scenario makes it difficult to diversify away idiosyncratic risk with limited number of stocks in a portfolio. The opposite could be expected in case of India as results reveal a significant downward trend in the idiosyncratic volatility in a limited time frame of 2013 to 2018.

Now, in order to examine idiosyncratic volatility effect in the Indian stock market, we construct quartile, quintile and decile portfolios. First, we cumulate daily returns measure earlier into monthly measures by simple addition. This is done in view of the fact that logarithmic returns have a nature of being time additive. Then, repetitively at each month end, all stocks in the sample are sorted from low to high level of idiosyncratic volatilities to enable rebalancing of desired quartile, quintile and decile portfolios. This is followed by the comparison of extreme average returns of the extreme corner portfolios in each case which represent respectively low and high idiosyncratic volatility portfolios. Idiosyncratic volatility effect is established when returns on high idiosyncratic volatility based portfolio consistently outperform returns on the low idiosyncratic volatility. The classical theorist do not encourage such compensation for the reason that since idiosyncratic risk is diversifiable, hence there should be no return for bearing such risk. Sehgal et. al. (2012) argue that it would be consistent with finance theory of compensation for imperfect diversification if a portfolio constructed on the basis of idiosyncratic volatility sort having high idiosyncratic volatility outperforms a portfolio having low idiosyncratic volatility.

**Table-4 : Monthly Returns on Idiosyncratic Volatility Sorted Portfolios**

Quartile	Average Return	Quintile	Average Return	Decile	Average Return
Low IV	-0.15	Low IV	-0.21	Low IV	-0.53
2	0.49	2	-0.20	2	0.16
3	1.57	3	-0.19	3	-0.07
High IV	3.88	4	-0.13	4	0.50
H-L	3.73	High IV	-0.07	5	0.90
t-stat	-7.406	H-L	-0.28	6	1.29
		t-stat	-2.521	7	1.39
				8	2.80
				9	3.34
				High IV	5.77
				H-L	5.24
				t-stat	-5.678

In this direction, we sorted all sample stocks on monthly basis against their idiosyncratic volatilities to form quartile, quintile and decile portfolios. The average returns on the extreme corner portfolios in each case were compared to investigate if average returns on the portfolio with high idiosyncratic volatility exceeded returns on portfolio with low idiosyncratic volatility. Our results are very interesting in terms of the idiosyncratic volatility effect. Table: 4 above presents the analysis of the average returns on the various sized stock portfolios sorted on the basis of monthly idiosyncratic volatility. In case of quartiles, each portfolio has about 44 stocks, in case of quintiles, the number is 35 and while in case of deciles, nine portfolios have 18 stocks each with one portfolio having 13 stocks. We perform different portfolio slices to verify sensitivity of portfolio size to the idiosyncratic volatility effect. From Table-4 above, it can be noticed that average returns move up from low idiosyncratic volatility portfolio to high idiosyncratic volatility portfolio both in case of quartile and decile portfolios with the exception of quintile portfolio where idiosyncratic volatility effect is not evidenced. These results show that idiosyncratic volatility effect in the Indian stock market is sensitive to the portfolio construction. These results are consistent with the findings of Drew and Veeraraghavan (2002), Brockman et al. (2009),

and Pukthuanthong-Le and Visaltanachoti (2009). Drew and Veeraraghavan (2002), Sehgal and Garg (2012) and Aziz and Ansari (2017). The analysis t-test results reveal presence of statistically significant difference in the average returns of portfolio with high idiosyncratic volatility over average returns of portfolio with low idiosyncratic volatility. Hence, our results formally establish existence of idiosyncratic volatility effect based on idiosyncratic volatility measures obtained through single factor market model.

### **Conclusion:**

The measurement of idiosyncratic risk of financial securities that arises from a host of unique individual stock factors is challenging task. Given this nature, it is indirectly observed and capture from the residuals of the regression models or other model free approaches. Idiosyncratic risk assumes importance as investors face constraints in achieving adequate diversification in their investments in financial securities. Due to this, the issue of idiosyncratic risk and stock returns has gained significance among researchers. In the present study, first we attempt to measure the idiosyncratic volatility. For this purpose, we use daily return data on various constituent stocks of a broad market index, Nifty200 over a recent five year period. Second, we transform our measures of monthly individual idiosyncratic volatility into aggregate market wide measure of idiosyncratic volatility to conduct its further analysis. Third, we fit a linear trend model into aggregate measure of idiosyncratic volatility and observe a presence of significant negative trend in idiosyncratic volatility over the chosen five year period. The evidence of a consistent negative trend has positive implications or the investors and portfolio managers in the form reduction in the cost of maintaining diversification. Finally, after sorting of stocks against their idiosyncratic volatility at each month end, we form portfolio of quartiles, quintiles and deciles to investigate existence of popular idiosyncratic volatility effect in case of the Indian stock market. We find strong evidence about the presence of idiosyncratic volatility effect in context of stock market that we chose for the present analysis.

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# Implications of Indian Accounting Standards (IND-AS) on Financial Performance of Select Companies in Karnataka

HOSAMANI MANJUNATHA AND MUBARAK

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**Abstract :** *The Government of India's Ministry of Corporate Affairs phased in the implementation of IND-AS. Ind AS was implemented to improve transparency and consistency. As a result, the introduction of a new concept causes changes in the value of assets and liabilities; hence, it is of the utmost importance to know whether IND-AS implementation has brought any significant changes in the financial performance of companies. Ratios and the paired t-test are the tools used. This paper shows the areas in which Karnataka's selected industries are required to focus before and after the implementation of IND-AS and their consequences on the financial performance of the selected companies. It was discovered that there is no significant difference in the liquidity, earnings per share, profitability, and valuation ratios of selected Karnataka companies. In this study, an impact matrix was also used, and it was discovered that IND-AS implementation has a low and medium positive impact on the financial performance of selected companies.*

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**Keywords :** Ind-AS, Impact matrix, Paired T-test, Ratios.

## 1. Introduction :

Globalization has made it possible for emerging economies like India to gradually integrate with developed economies through cross-border commerce and investments. The regional accounting standards (languages) are therefore no longer necessary because shareholders are no longer confined to the borders of the respective sovereign countries but rather are dispersed throughout the

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continents. Therefore, there was a perceived urgent need for universally acknowledged, high quality financial reporting in order to improve understanding and to promote the openness and comparability of financial reports, which enable users to make informed decisions. Due to this, it became necessary to harmonise accounting standards or move toward international accounting standards, often known as international financial reporting standards (IFRS).

Indian Accounting Standards (Ind AS) are IFRS Standards as issued by the Board with some modifications, such as terminology changes, option eliminations, disclosure additions, disclosures that are deemed to be in conflict with local law eliminations, addition of other disclosures, addition of presentation requirements, addition of (and, in some cases, deletion of) examples, and modifications to the principles for recognising assets, liabilities, income, and expenses. Some of those changes must be made, while others are optional. An Appendix that details the adjustments can be found with each specific Ind AS. For accounting periods beginning on or after April 1, 2015, all businesses, including privately held ones, may utilise Ind AS. Ind AS will gradually be implemented for large unlisted companies and public companies (other than those on the SME Exchange) in 2016 and 2017. Companies that don't implement Ind AS will keep using the current Accounting Standards (IGAAP). Some businesses may voluntarily offer IFRS financial statements to investors in addition to Ind AS financial accounts.<sup>6</sup> Commercial banks, insurance providers, and non-bank businesses must begin preparing their financial statements using Ind AS as of 1 April 2018, the Indian government declared on 18 January 2016.

## **2. Review of Literature :**

Some standard changes, such as those relating to revenue recognition practices, fair asset valuation the reclassification of actuarial gains and losses, projected dividends and deferred tax assets, employee-based share awards, etc. would have an impact on the financial statements of the majority of companies. CRISIL (2016) and Ernst & Young (2016) made an effort to recognise Indian enterprises' transition to Ind AS experience. The impact of INDA on companies follows a mixed trend, according to an examination of the financial results of 60 companies that are included in the BSE's top 100 list and are also covered in phase 1 of the INDA plan. Additionally, they believed that more time was needed for the businesses to prepare for thorough Ind AS reporting. The manufacturing and information technology industries will need to make the the majority of Ind-AS accounting changes, followed by the industries of telecommunications, mining and metals, and energy, according to a study by Protiviti (2016) on the first quarter



of the FY 2017 results of about 125 companies. It is also said that the sample companies have, on average, made 10 modifications to the reported earnings for the quarter ended June 30, 2015. The calculation of the listed firms' operational profit, net profit, revenue, and net value will be significantly impacted by Ind AS. Additionally, it is stated that industries like telecom, oil and gas, metals, and real estate are probably going to be most affected. Analyst predictions indicate that the new standards may result in a 4-5% increase in revenues but a 2-3% decline in overall EBITDA. According to Shyam, Ashutosh (2016), PWC's top five areas that the implementation of Ind AS would have a substantial influence on financial statements include leases, operating segments, financial instruments (including derivatives), taxes, and revenue recognition (including embedded leases) PWC (2016). Every aspect of Ind AS will be covered, including reported costs, earnings, assets, liabilities, and equity. To ensure transparency between an asset's book value and fair value, the IND AS mandates fair valuation of both financial instruments and assets. The corporation's issue in this situation is the demanding labor required to determine an asset's fair market value. Goyal (2018).

### **3. Statement of the Problem :**

The introduction of a new concept will cause changes in financial data presentation. These changes in data visualization will increase data openness, understandability, and adaptability. It is expected that increased transparency will result in the disclosure of all relevant information. As a result, investors will have a better grasp on the financial facts. This will have an impact on financial performance, which could be positive or negative, or both, or at different levels such as a minor impact, a significant impact, or a moderate impact. As a result, this study is important in answering these questions.

### **4. Objectives of the Study :**

1. To analyse and compare the impact of Ind-AS on the financial performance of select companies in Karnataka before and after Ind-AS through an analysis of liquidity, profitability, and valuation ratios.

### **5. Hypothesis of the Study :**

**H01 :** There is no substantial change in liquidity ratios between selected companies in Karnataka before and after the adoption of IND-AS.

**H02 :** There is no substantial change in per share ratios between companies in Karnataka before and after the adoption of IND-AS.

**H03 :** There is no substantial change in profitability ratios between companies in Karnataka before and after the adoption of IND-AS.

**H04 :** There is no substantial change in valuation ratios between companies in Karnataka before and after the adoption of IND-AS.

## **6. Research Methodology :**

All of the secondary sources have been used in the current investigation. The engineering, information technology, and pharmaceutical industries were chosen by the researcher since they are a few of the most significant industries for the Karnataka state economy.

### **6.1 Scope of the Study :**

The purpose of the article is to investigate how the implementation of the Indian Accounting Standard has affected the financial performance of companies in the engineering, IT, and pharmaceutical sectors. By examining the changes made in key ratios of the companies as a result of the implementation of Ind AS in the financial year 2015-16, the impact on financial condition has been examined. The study spans ten financial years, or from 2011-12 to 2021-22.

### **6.2 Periodicity**

The annual reports of the firms for 10 consecutive years, 2011-12 to 2021-22, have been gathered in order to collect financial data under before and after IND-AS for the financial year 2021-22 for analysis and comparison. It should be noted that our data is limited owing to the COVID-19 epidemic. As a result, our data does not include 2019 and 2020 because our findings may not accurately reflect the repercussions of IND-AS on such periods.

### **6.3 Data Source**

Financial information was taken from six Ind-AS-compliant Karnataka-based companies from the three key industries of engineering, information technology, and pharmaceuticals during the financial year/transition year 2011-2022.

### **6.4 Determination of Sample Size and Sampling**

If the company qualifies, a sample selection has been produced to analyse the transition impact analysis.

1. If the business is subject to mandatory implementation and has a net worth of more than Rs. 250 crore.

2. After taking into account the aforementioned prerequisites, companies are chosen at random if the company is listed on recognised stock exchanges.

Six companies from Karnataka have finally been chosen, three of which are listed on the NSE, BSE, or both.

**Table-1 : Showing Karnataka based Either Listed Companies in NSE and BSE or in both Stock Exchanges which are Implemented IND-AS**

Sector	No. of Companies Listed	No. of Companies Implemented IND-AS	Companies Selected
Banking	2	0	0
Breweries and Distilleries	2	2	0
Engineering	7	7	2
Financials	2	2	0
fragrances	1	1	0
Health care	1	1	0
Hospitality	1	1	0
Information technology	8	8	2
Pharmaceuticals	7	7	2
Steel	2	2	0
Cement	1	1	0
Others	20	20	0

(Source : Karnataka.com)

**Table-2 : Showing Companies Selected for the Study is as follows:**

INDUSTRY	Randomly Selected Companies	
<b>Electrical</b>	Bharat Electronics Limited (BEL)	Kirloskar Electric Company Ltd (KEL)
<b>Software</b>	Infosys Limited (Infosys)	Wipro Limited (Wipro)
<b>Pharmaceuticals</b>	AstrazenecaPharma India Ltd (Astr)	Biocon Limited (Bio)

(Source: prepared by the researcher)

The above companies are chosen by the researcher randomly these companies having high net worth and market capitalization in their respective industries.

## 7. Analysis of Impact Direction and Level of Ind-AS on Financial Performance of Select Companies In Karnataka :

### Impact Matrix :

In this study the researcher using impact matrix prepared through percentage changes before 5 years and after 5 years of IND-AS. The following formula used for calculation of percentage changes.

$$\text{Impact} = \frac{\text{mean of 5 years ratios (before IND-AS)} - \text{mean of 5 years ratios (after IND-AS)}}{\text{Mean of 5 years ratios (after IND-AS)}}$$

From the results of above formula the researcher prepared a slab to understand level of impact by IND\_AS on financial performance of select companies in Karnataka, the slab is as follows.

**Table-3 : Showing Positive and Negative Impact Slab**

Positive Impact		Negative Impact	
1% to 25%	<b>LPI</b>	1% to 25%	<b>LNI</b>
25% to 50%	<b>MPI</b>	25% to 50%	<b>MNI</b>
50% to 75%	<b>HPI</b>	50% to 75%	<b>HNI</b>
75% above	<b>SPI</b>	75% above	<b>SNI</b>

(Source : prepared by the researcher)

Where, LPI indicates "Low Positive Impact," MPI "Medium Positive Impact," HPI "High Positive Impact," SPI "Significant Positive Impact," and LNI "Low Negative Impact," MNI "Medium Negative Impact," HNI "High Negative Impact," and SNI "Significant Negative Impact."

**Table-4 : Showing Impact Matrix of IND-AS on Financial Performance of Select Companies in Karnataka**

Industries	ELECTRICAL		SOFTWARE		PHARMACEUTICALS		Average impact
	BEL	KEL	INF	Wipro	Astra	Bio	
<b>PER SHARE RATIOS</b>							
<b>Basic EPS (Rs.)</b>	16.3	-6.9	54.9	23.7	15.5	9.5	<b>18.83</b>
	LPI	LNI	HPI	LPI	LPI	LPI	<b>LPI</b>
<b>Cash EPS (Rs.)</b>	18.9	-5.4	61.1	26.9	22.3	13	<b>22.80</b>
	LPI	LNI	HPI	LPI	LPI	LPI	<b>LPI</b>

<b>Book Value [InclReval Reserve] / Share</b>	103.6	19	236.1	125.8	126.5	173.5	<b>130.75</b>
	SPI	LPI	SPI	SPI	SPI	SPI	<b>SPI</b>
<b>Dividend / Share(Rs.)</b>	5	0	29.3	2.2	1.4	0.5	<b>6.40</b>
	LPI	0	MPI	LPI	LPI	LPI	<b>LPI</b>
<b>Revenue from Operations/Share (Rs.)</b>	100.1	65.5	244.2	132.9	262.8	62.2	<b>144.62</b>
	SPI	MPI	SPI	HPI	SPI	MPI	<b>SPI</b>
<b>PBDIT/Share (Rs.)</b>	25	-1	79.9	35.3	29.6	14.5	<b>30.55</b>
	LPI	LNI	HPI	MPI	MPI	LPI	<b>MPI</b>
<b>PBT/Share (Rs.)</b>	22.6	-6.8	74.1	31	22.6	11.8	<b>25.88</b>
	LPI	LNI	HPI	MPI	LPI	LPI	<b>LPI</b>
<b>Net Profit/Share (Rs.)</b>	16.5	-6.8	55.5	23.9	15.5	9.3	<b>18.98</b>
	LPI	LNI	HPI	LPI	LPI	LPI	<b>LPI</b>
<b>PROFITABILITY RATIOS</b>							
<b>Net Profit Margin (%)</b>	15	-6.7	21.9	17.7	4.6	11.9	<b>10.73</b>
	LPI	LNI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>Return on Networth / Equity (%)</b>	17.6	-27	23.5	19	10.1	3.4	<b>7.77</b>
	LPI	MNI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>Return on Capital Employed (%)</b>	20.6	0	29	23	14.9	3.6	<b>15.18</b>
	LPI	LNI	MPI	LPI	LPI	LPI	<b>LPI</b>
<b>Return on Assets (%)</b>	6.6	-3.7	18.3	13.1	5.2	2.9	<b>7.07</b>
	LPI	LPI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>Asset Turnover Ratio (%)</b>	47.1	49.3	84.2	74.1	117.6	27.3	
	MPI	MPI	HPI	HPI	SPI	MPI	<b>MPI</b>
<b>LIQUIDITY RATIOS</b>							
<b>Current Ratio (X)</b>	0.5	-0.6	2.3	1.8	0.7	2.3	
	LPI	LNI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>Quick Ratio (X)</b>	0.1	-0.7	2.3	1.8	0.2	1.6	
	LPI	LNI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>VALUATION RATIOS</b>							
<b>EV/Net Operating Revenue (X)</b>	1.9	-0.2	4.2	2.7	4.8	13.8	<b>4.53</b>
	LPI	LNI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>EV/EBITDA (X)</b>	11.1	5.5	15.3	12.6	60.9	77.5	<b>30.48</b>
	LPI	LPI	LPI	LPI	HPI	SPI	<b>MPI</b>

<b>MarketCap/Net Operating Revenue (X)</b>	2.4	-0.6	4.5	2.7	5.1	14	<b>4.68</b>
	LPI	LNI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>Retention Ratios (%)</b>	46.1	-1	40.7	65.6	17.9	27.2	<b>32.75</b>
	MPI	LNI	MPI	HPI	LPI	MPI	<b>MPI</b>
<b>Price/BV (X)</b>	2.9	5.3	5.3	3	12.5	3.3	<b>5.38</b>
	LPI	LPI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>Price/Net Operating Revenue</b>	2.4	-0.6	4.5	2.7	5.1	14	<b>4.68</b>
	LPI	LNI	LPI	LPI	LPI	LPI	<b>LPI</b>
<b>Earnings Yield</b>	-0.95	-1.33	-0.95	-0.95	-0.99	-0.98	<b>-1.03</b>
	SNI	LNI	SNI	SNI	SNI	SNI	<b>SNI</b>

(Prepared by the researcher)

Comparing the Impact matrix of the financial ratio items, it was discovered that most ratios have low positive impacts, with the exception of Book Value [Incl Reval Reserve]/Share (Rs.), which has a high positive impact due to fair value measurement. Earning yield ratio, on the other hand, has a strong negative impact, but this is advantageous for the company because a low earning yield ratio indicates overvalued stock. As a result, Ind-AS positively impacted earning yield ratio because of fair value measurement. And Ind AS has medium positively impacted on PBIT/Share, EV/EBITDA, Retention Ratios (%) and Asset Turnover Ratio (%). The aforementioned table makes it very evident that practically all selected organizations from various industries saw a small but favorable impact on their financial performance after implementing the Ind ASs.

## 8. Hypothesis Testing Results :

**Table-5 : Showing Paired t Test Result for Liquidity Ratios before and after Ind-AS Implementation**

<b>Augmented Hypothesis statements</b>	<b>p-value, @5% significance level</b>					
There is no discernible difference in current ratio among selected Karnataka companies before and after the implementation of IND-AS.	BEL	KEL	Info	Wipro	Arns	Bio
	0.28	0.01	0.00	0.05	0.26	0.06
	A	R	R	R	A	A
There is no discernible difference in quick ratio among selected Karnataka companies before and after the implementation of IND-AS.	BEL	KEL	Info	Wipro	Arns	Bio
	0.06	0.01	0.00	0.08	0.19	0.08
	A	R	R	A	A	A

(Prepared by the researcher)

The paired t test results are shown in the above table for the current and quick ratios of selected companies, where R= null hypothesis being rejected due to the p value indicating statistically significant changes and A= null hypothesis being accepted due to statistically insignificant changes. While the null hypothesis accepted by KEL and Infosys firms indicates that there is a significant difference between current and quick ratios before and after the implementation of Ind AS. The preceding table makes clear that the implementation of Ind AS has solely a company-specific impact and has no effect on industry-wide liquidity ratios.

**Table-6 : Showing Paired t Test Result for Per Share Ratios before and after Ind-AS Implementation**

<b>Augmented Hypothesis statements</b>	<b>p-value, @5% significance level</b>					
There is no discernible difference in Basic EPS (Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.00	0.97	0.00	0.94	0.23	0.29
	R	A	R	A	A	A
There is no discernible difference in Cash EPS (Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.00	0.87	0.00	0.99	0.17	0.31
	R	A	R	A	A	A
There is no discernible difference in Book Value(Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.00	0.29	0.01	0.56	0.09	0.38
	R	A	R	A	A	A
There is no discernible difference in Dividend / Share (Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.01	0.00	0.03	0.02	0.93	0.03
	R	R	R	R	A	R
There is no discernible difference in Revenue from Operations / Share (Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.00	0.00	0.01	0.87	0.1	0.38
	R	R	R	A	A	A
There is no discernible difference in PBDIT / Share (Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.00	0.5	0.01	0.97	0.23	0.25
	R	A	R	A	A	A
There is no discernible difference in PBT / Share (Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.00	1	0.00	0.97	0.29	0.3
	R	A	R	A	A	A
There is no discernible difference in Net Profit / Share (Rs.) among selected Karnataka companies before and after the implementation of IND-AS.	<b>BEL</b>	<b>KEL</b>	<b>Info</b>	<b>Wipro</b>	<b>Arns</b>	<b>Bio</b>
	0.00	0.99	0.00	0.99	0.23	0.29
	R	A	R	A	A	A

(Prepared by the researcher)

The results of the paired t test for the per share ratios of the chosen companies are displayed in the table above. Following the implementation of Ind-AS, the following metrics for BEL and Infosys companies have all undergone considerable change: basic earnings per share, cash EPS, book value per share, PBIT/share, PBT/share, and net profit/share. However, after the adoption of Ind-AS, practically all firms' dividend per share and revenue from operations/share changed dramatically, with the exception of ARNs and Wipro.

**Table-6 : Showing Paired t Test Result for Profitability Ratios before and after Ind-AS Implementation**

Augmented Hypothesis statements	p-value, @5% significance level					
	BEL	KEL	Info	Wipro	Arns	Bio
There is no discernible difference in Net Profit Margin (%) among selected Karnataka companies before and after the implementation of IND-AS.	0.52	0.99	0.1	0.16	0.26	0.17
	<b>A</b>	<b>A</b>	<b>R</b>	<b>A</b>	<b>A</b>	<b>A</b>
There is no discernible difference in Return on Networth / Equity (%) among selected Karnataka companies before and after the implementation of IND-AS.	0.06	0.59	0.58	0.01	0.36	0.01
	<b>A</b>	<b>A</b>	<b>A</b>	<b>R</b>	<b>A</b>	<b>R</b>
There is no discernible difference in Return on Capital Employed (%) among selected Karnataka companies before and after the implementation of IND-AS.	0.00	0.56	0.27	0.12	0.27	0.01
	<b>R</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>R</b>
There is no discernible difference in Return on Assets (%) among selected Karnataka companies before and after the implementation of IND-AS.	0.15	0.78	0.29	0.41	0.43	0.01
	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>R</b>
There is no discernible difference in Asset Turnover Ratio (%) among selected Karnataka companies before and after the implementation of IND-AS.	0.12	0.00	0.91	0.02	0.05	0.00
	<b>A</b>	<b>R</b>	<b>A</b>	<b>R</b>	<b>R</b>	<b>R</b>

(Prepared by the researcher)

The results of the paired t test for the profitability ratios of the chosen companies are displayed in the table above. Among the chosen companies, with the exception of Infosys, the net profit margin ratio and return on equity were not considerably influenced. With the exception of BEL and Bio, none of the chosen companies' return on capital employed experienced a major impact. With the exception of BEL and Infosys, return on assets dramatically altered practically all businesses. After Ind-AS implantation, the return on assets didn't improve considerably. The only company to show a considerable difference was Biocon.



**Table-6 : Showing Paired t Test Result for Valuation Ratios before and after Ind-AS Implementation**

Augmented Hypothesis statements	p-value, @5% significance level					
	BEL	KEL	Info	Wipro	Arns	Bio
There is no discernible difference in EV/ Net Operating Revenue among selected Karnataka companies before and after the implementation of IND-AS.	0.04	0.03	0.68	0.78	0.98	0.04
	R	R	A	A	A	R
There is no discernible difference in among selected Karnataka companies before and after the implementation of IND-AS.	0.05	0.38	0.4	0.88	0.17	0.06
	R	A	A	A	A	A
There is no discernible difference in Market Cap/Net Operating Revenue among selected Karnataka companies before and after the implementation of IND-AS.	0.08	0.04	0.86	0.92	0.89	0.04
	A	R	A	A	A	R
There is no discernible difference in Retention Ratios (%) among selected Karnataka companies before and after the implementation of IND-AS.	0.06	0.07	0.13	0.9	0.88	0.12
	A	A	A	A	A	A
There is no discernible difference in Price/BV among selected Karnataka companies before and after the implementation of IND-AS.	0.02	0.44	0.66	0.39	0.2	0.23
	R	A	A	A	A	A
There is no discernible difference in Price/Net Operating Revenue among selected Karnataka companies before and after the implementation of IND-AS.	0.08	0.04	0.86	0.92	0.89	0.04
	A	A	A	A	A	R
There is no discernible difference in Earnings Yield among selected Karnataka companies before and after the implementation of IND-AS.	0.11	0.71	0.84	0.55	0.28	0.00
	A	A	A	A	A	R

(Prepared by the researcher)

The results of the paired t test for the valuation ratios of the chosen companies are displayed in the table above. After implementation of Ind-AS, BEL, KEL, and Biocon businesses all experienced a considerable impact on EV/Net Operating Revenue. Return on EV/EBITDA in KEL was considerably impacted. KEL and Biocon firms' differences in market capitalization and net operating revenue were severely impacted. In the BEL Company, the price/BV drastically altered. The price-to-net operating revenue and earnings yield ratios of Biocon

firms have altered dramatically. Retention Ratios (%) have not changed considerably across any of the selected Karnataka enterprises.

## **9. Conclusion:**

The goal of the current study is to determine whether the implementation of Ind-AS has any impact on the financial performance of a sample of businesses from three of Karnataka's most important industries. A combination of liquidity, per-share, profitability, and valuation ratios were utilized to objectively analyze the effect of Ind-AS on financial performance. Impact matrix and paired T-test have then been used to determine whether there is a statistically significant difference between the financial ratios under the two regimes, which are before and after Ind-AS.

The liquidity, share price, profitability, and value characteristics of the selected companies are marginally affected positively by IND-AS, according to the impact matrix analysis of the study. While the deployment of Ind-AS has had a moderately good influence on several specific ratios. The paired-test result showed that the financial ratios calculated under the two regimes are not significantly different. There have been other ratios where there is a significant difference, but those are not industry-specific. Although t

here have been some notable ratio adjustments, the deployment of Ind-AS in Karnataka has not directly harmed any industry's financial performance.

According to the impact matrix's findings, some ratios in the primary three sectors chosen companies had modest and medium positive impacts on nearly all ratios.

the fair value measurement, revenue recognition standards, recognition of various tax assets and liabilities, and asset and liability classification all contribute to the positive growth.

The financial statements of the chosen industries will be significantly impacted by all of the aforementioned factors.

It will take time because there are multiple processes involved that might not all be finished in a few years.

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# Study on Budgetary Control with Reference to the Krishna Sahakari Sakkare Kharkhane Niyamita, Athani, Karnataka

MURUGENDRA WALI, SANJAY ASHWALE AND KUMARSWAMY HIREMATH

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**Abstract :** *Budgetary control is the important aspect for industry development because budgets provide yard stick against which the actual performance is measured. It always helps to the top management to take the appropriate decision to motivate and directing their personnel towards well set plans and policies of the company.*

*By considering the advantage of the budgetary control the Krishna Sugars also adapted this system. In Krishna Sugars they were maintaining the monthly budget with the help of daily reports. The daily reports must contain the item like production efficiency, sugar cane utilization, man power requirement, consumption of electricity, wages etc. With this the budgetary control manager prepares a monthly profitability statement of a particular month & submitted that one of the appropriate authorities like production manager. By this statement or submitted report, they will take correct decision about the organizational activities.*

*A study has been conducted on the "BUDGETARY CONTROL" which is most probably adopted in the Krishna Sugars organization.*

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**Keywords :** Budgetary Control, Sugar Cane Industry, Activity Ratio, Capacity Ratio, Efficiency Ratio.

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## **Introduction :**

Budgetary control i.e. a most powerful tool to the management for performing its function i.e. formulating plans, coordinating activities and controlling operationsetc, effectively aswell as effectively.

Now a day, the number of companies are competed with each other for the survival in the present market. Whether it may be other sugars industries.but no one company can compete proper planning. So, the Cost-Budgetary control may help them to make proper decision in the number of various fields.

Budgetary control is applied to a system of management & accounting control by which all operations& output are forecasted as for ahead as possible. And actual results are known that are compared without budget estimates.

The budgetary system integrates key managerial functions as it links top management's planning function with the control function performed at all the levels in the managerial hierarchy. A more accurate budget can be developed for those activates where direct relationship exists between inputs & outputs. These input, output are base for developing budgets& exercising control.

## **Introduction To Sugar Industry:**

The Indian sugar industry is a key driver of rural development, supporting India's economic growth. The industry is inherently inclusive supporting over 50 million farmers and their families, along with workers and entrepreneurs of almost 500 mills, apart from a host of wholesalers and distributors spread across the country. The industry is at a cross roads today, where it can leverage opportunities created by global shifts in sugar trade as well as the emergence of sugarcane as a source of renewable energy, through ethanol and cogeneration. While some of these opportunities have been well researched in the past, there was a need to assess the potential for India and to develop a comprehensive and actionable roadmap that could enable the Indian industry to take its rightful place as a food and energy producer for one of the world's leading economies. India is second largest producer of sugarcane next to Brazil. As per last year data, about 4 million hectares of land is under sugarcane with an average yield of 70 tones per hectare. India is largest producer of sugar including traditional sugar sweetener, Khandasari and Gur equivalent to 26 million tones raw value followed by Brazil in the second place at 18.5 million tones. Even in respect of white crystal sugar, India has ranked No position 7 out of last 10 years. Traditional Khandasari and Gur are consumed mostly by the rural population in the early

1930's nearly 2/ 3rd of sugarcane production was utilized for production of alternate sweetener, Gur & Khandasari. With better standard of living and high income, the sweetener demand has shifted to white sugar. About 1/ 3rd of sugarcane production is utilized by the Gur & Khandasari sectors. Being in the small-scale sector, these two sectors are completely free from controls and taxes, which are applicable to the sugar sector.

## **Company Profile:**

### **Introduction:**

The Krishna Sahakari Sakkare Karkhane Niyamit, Athani is a Co- operative society registered under Karnataka Co-operative societies Act in 1969. The Plant is located at Sankonatti Village of Athani in Belgaum district. The registration number of the company is DSK/ REG/ 01/ 80-81 dated 10-03- 1981. The industrial license number of the factory is L.I.667 (1988) dated 02/ 11/ 1988. The founder of this organization was Late Shri. A. B. Jakanur Ex. minister of Karnataka. At present KSSKN has an attractive campus with magnificent buildings over it. There are totally 17, 971 shareholders of KSSKN and it have paid up share capital of Rs.18.37 Crores. During the year 2006-07, it has earned a net profit of Rs.2.15 crores. During the same year it has produced 7.09 lakhs Quintals of sugar and it has crushed 6.01 lakhs Tonnes of cane there are 614 workers in KSSKN. It is paying salary of Rs. 15, 00, 000 per month to its workers. Total Turnover of sugar is Rs.60.03 crores. The organization study of KSSKN Athani included the overall study of different departments and sections and sub-sections. The departments' studies include Finance and Accounts department, Labor Welfare department, Purchase Department, Marketing and Sales department, Production Department etc. Each department has its own methods and procedures of Working Capital Management.

By conducting the organizational study, it was found that all the departments were actively working towards the achievement of the goals and objectives of the company. The management is also efficient in the work, so the company is achieving great progress year by year. The research study was conducted on the topic "A study on sugar pricing in KSSKN Athani For the purpose of Project work a sample of 30 tendered or respondents was covered. Also, while administering Questionnaire care was taken to ensure that the sample was the representative of the population. The objective of the study was to know the factors influencing sugar pricing, whether customers are satisfied with selling/ tendering process etc.

By carrying out the study it was found that, the factors like grade of sugar, dust freeness, transportation cost, Govt. policies and Sugar Release mechanism have influence on pricing of sugar and also it was found that most of the customers are satisfied with the selling or tendering process of KSSKN Athani. This study gave me an insight as to how the industry works and how important this sector is to the economy. This research gave me a thorough experience of the sugar industry.

The factory started on 24/03/2002 with initial crushing capacity of 2500 TCD with total expenditure of Rs.46.95 Crore. And expansion on 2011-12 is with a crushing capacity on 6000 TCD. The area of operation covered 22 villages from Athani Taluk.

<b>Name of the Company</b>	Krishna Sahakari Sakkare Karkhane Niyamit Athani
<b>Date of incorporation/Registration</b>	No.DSK/REG/01/80-81 Date:10-03-1881
<b>Nature of Constitution</b>	Co-operative Sector
<b>Factory Code No.</b>	40501
<b>Date of Commencement of Commercial Production of Sugar</b>	12-06-2002
<b>Crushing Capacity</b>	5500TCD
<b>Project Cost</b>	48.86 Corers
<b>Production</b>	Production of Sugar and its by Products Like Molasses and Biogases
<b>Working Period</b>	180-210Days
<b>Type unit</b>	Large scale Agro based manufacturing unit
<b>Main raw material</b>	Sugarcane
<b>Labour employed</b>	610
<b>Area of operation</b>	22 villages

### Need For The Study :

- The research study is undertaken to analyze and understand the budgetary control process in financial sector which gives mean exposure to practical implication of theory knowledge.

- To know about the company's operation of using various budgetary control techniques.
- To know how the company gets funds from various sources.

### **Statement of The Problem:**

- The purpose of the study is to estimate of receipts and payments of revenue and capital items in future. Hence study has been entitled as A STUDY ON BUDGETARY CONTROL.
- To analyze how budgetary control helps the sugar factory to select best course of action.
- To provide a detailed plan of action for a business over a period of time.
- To revise the budget in the light of changed circumstance.

### **Objectives of The Study:**

- To secure for the worker fair wages.
- To improve the working conditions and express share in the increased profitability.
- To secure the workers security of employment and protect the larger interest of the society.

### **Scope of Study:**

This study was made on sugar pricing to know the factors influencing pricing of sugar which is concerned with tender located in and around the Athani. This study cannot be generalized to entire market state or country.

### **Research Methodology:**

It means the science of method or the body of method is independence because of its scientific free thought. Unless a proper method is followed and project work or study would not be a success. There for, to arrive notable results, methodology should form a significance part of it. The aim is to present a clear idea of the procedure followed in this study. Since the value of any systematic and scientific research lies in its method, which gives a clear idea of the form of procedure adopted in conducting it & stating the purpose becomes the essential part of every study.



### Source of Data :

**Primary Data :** The information is collected from the personal interaction with the accounts officer and workers of the union.

**Secondary Data :** This is collected through A) Annual reports of the KSSKN.B) Related information from internet.

### Limitation of The Study:

The main demerits or limitations of budgetary control are as follows:

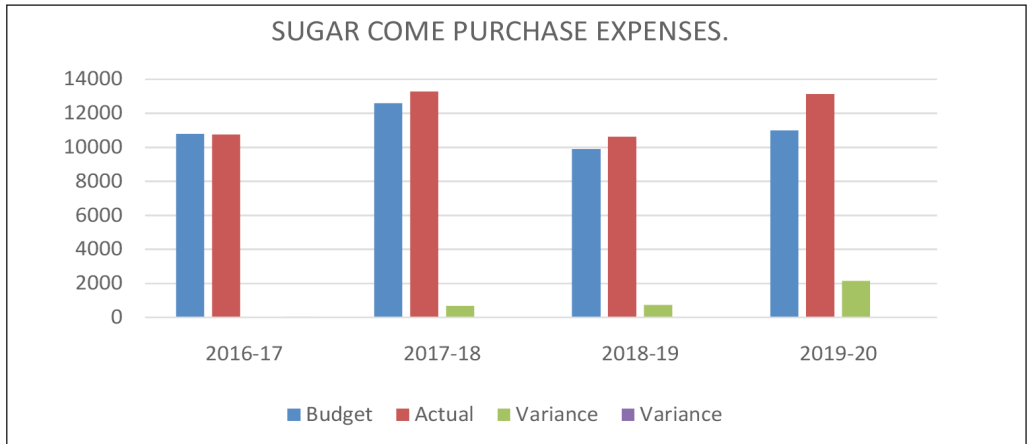
1. The system of budgeting is based on estimates. If estimates go wrong then the budgetary control system may suffer adversely.
2. A budgetary control can be effective only when it is flexible. But it is not an easy job to attain flexibility in a day in budget making and this can affect the effectiveness of a budgetary control system.
3. Budgeting is taken as a substitute rather than as a tool of management. This leads to harmful consequences in the business.

### Analysis and Interpretation of Data:

#### Presentation of Data in Tables :

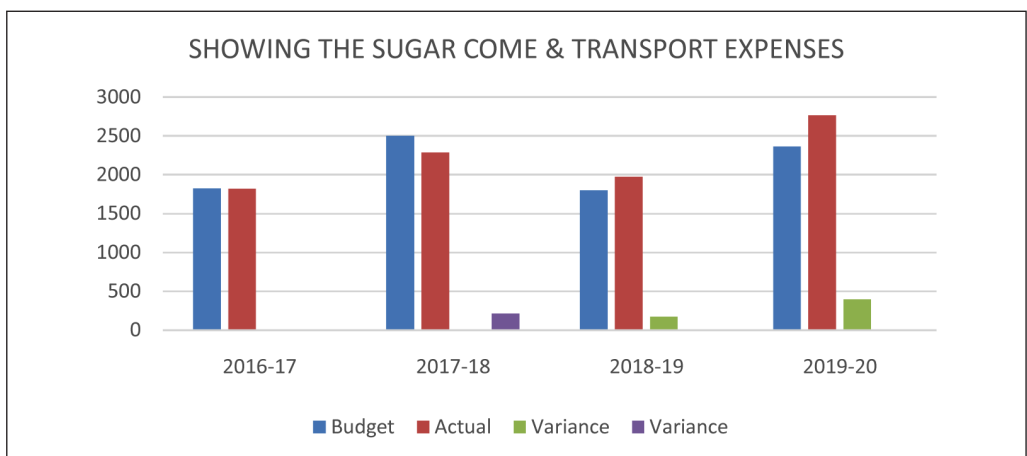
**Table-1 : SUGAR COME PURCHASE EXPENSES. (In lakhs)**

Budget	Actual	Variance		Remark
		Incr.	Decr.	
10800	10747	–	52.98	Favorable
12600	13278.1	678.12	–	Adverse
9900	10631.2	731.15	–	Adverse
11000	13147.8	2147.78	–	Adverse



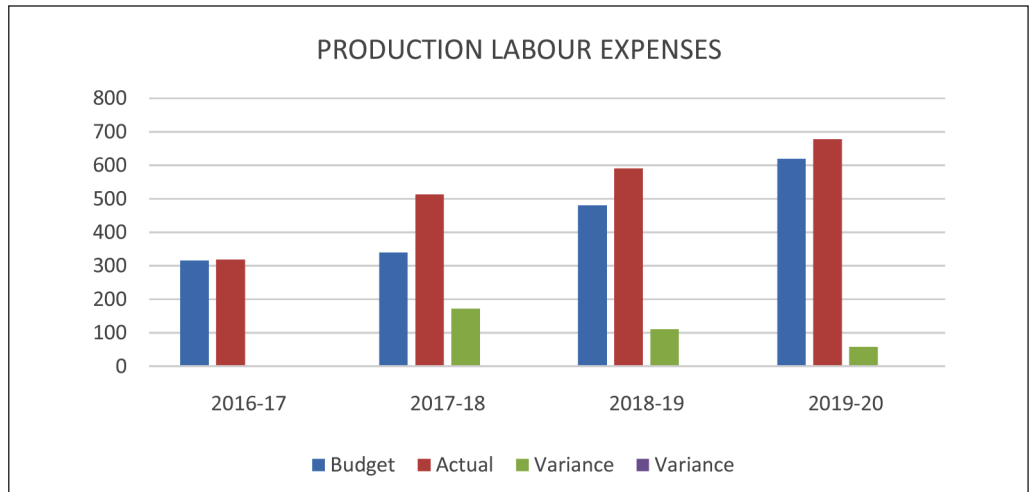
**Table-2 : SHOWING THE SUGAR COME & TRANSPORT EXPENSES (In lakhs)**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	1821	1817.64	-	3.36	Favorable
2017-18	2500	2287.57	-	212.43	Favorable
2018-19	1800	1975.26	175.26	-	Adverse
2019-20	2365	2763.19	398.14	-	Adverse

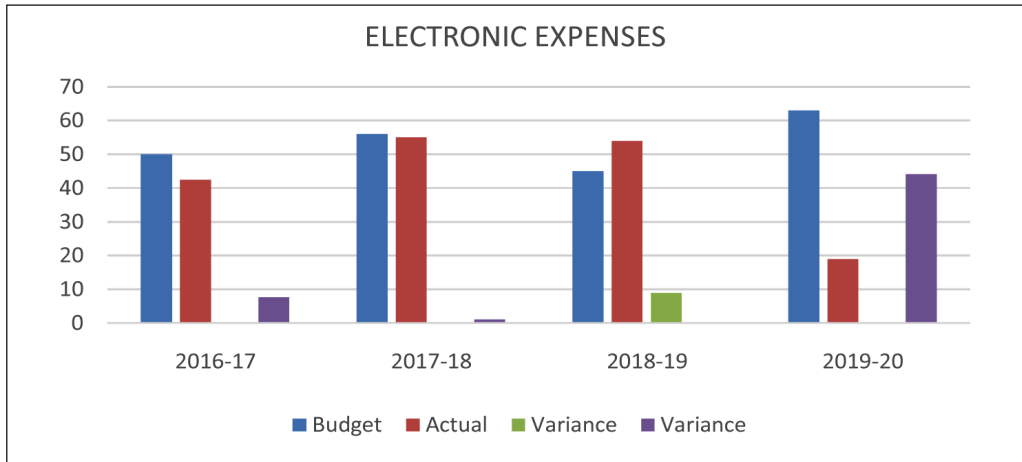


**Table-3 : PRODUCTION LABOUR EXPENSES(In lakhs)**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	315	317.79	2.79	–	Adverse
2017-18	340	512.22	172.22	–	Adverse
2018-19	480	590.61	110.61	–	Adverse
2019-20	620	677.78	57.78	–	Adverse

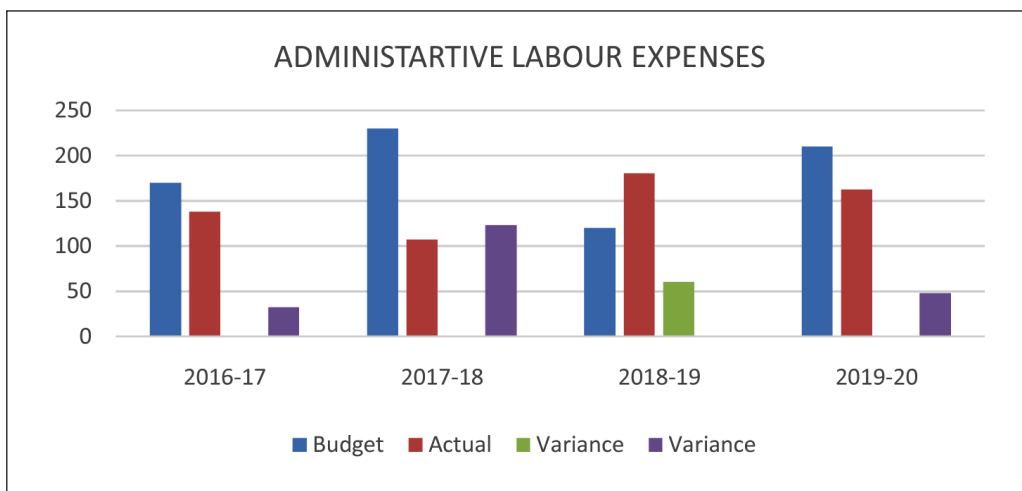
**Table-4 : ELECTRONIC EXPENSES (In lakhs)**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	50	42.4	–	7.6	Favorable
2017-18	56	54.98	–	1.02	Favorable
2018-19	45	53.92	8.92	–	Adverse
2019-20	63	18.93	–	44.07	Favorable



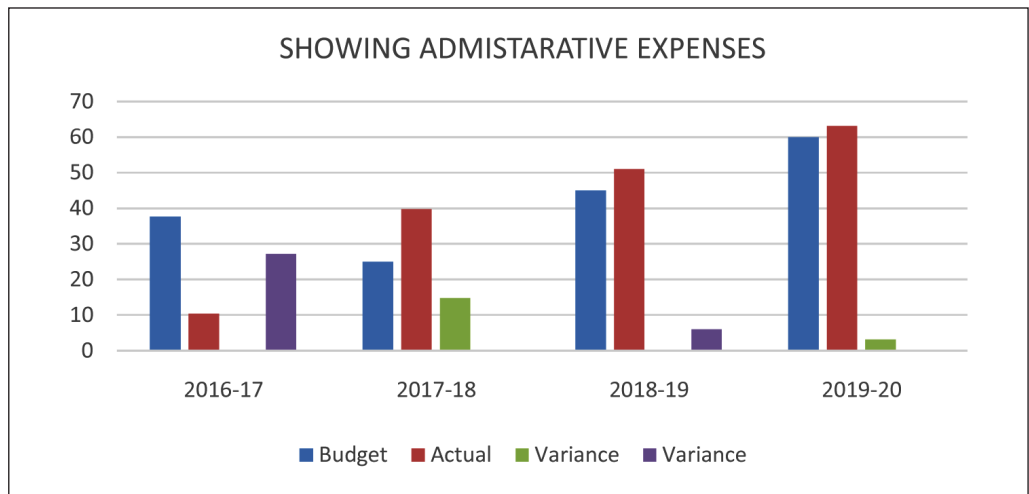
**Table-5 : ADMINISTARTIVE LABOUR EXPENSES (In lakhs)**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	170	137.79	–	32.21	Favorable
2017-18	230	106.93	–	123.07	Favorable
2018-19	120	180.49	60.49	–	Adverse
2019-20	210	162.32	–	47.68	Favorable

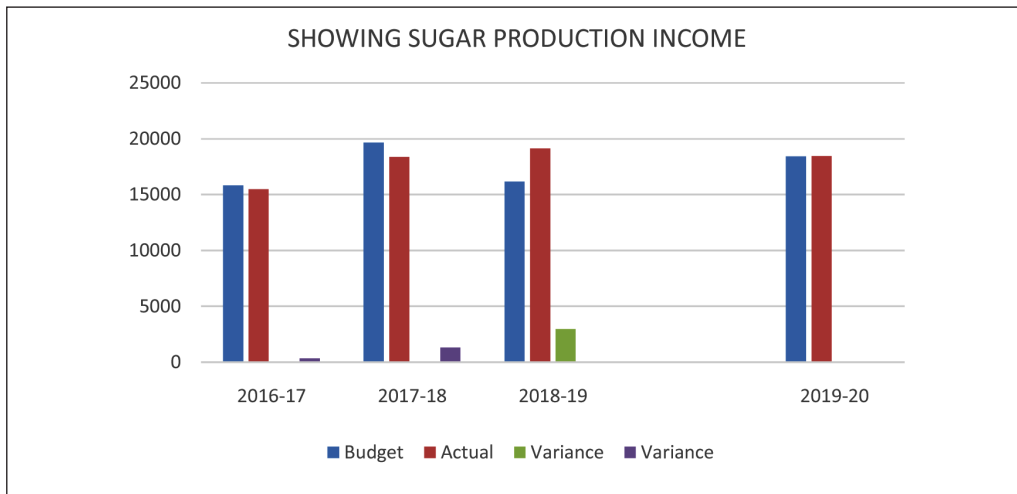


**Table-6 : SHOWING ADMISTARATIVE EXPENSES**

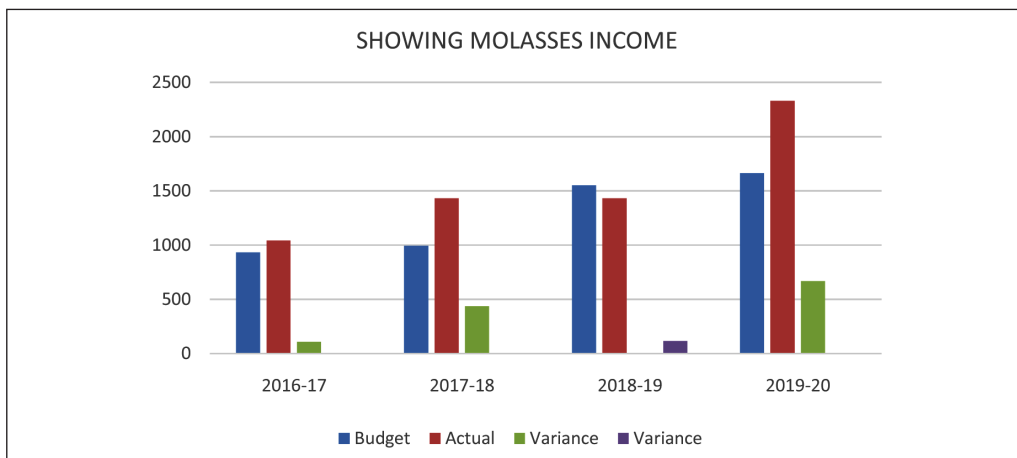
Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	37.6	10.41	–	27.19	Favorable
2017-18	25	39.79	14.79	–	Adverse
2018-19	45	50.98	–	5.98	Favorable
2019-20	60	63.13	3.13	–	Adverse

**Table-7 : SHOWING SUGAR PRODUCTION INCOME (In lakhs)**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	15816.2	15482.7	–	333.5	Favorable
2017-18	19680.4	18380.8	–	1299.6	Favorable
2018-19	16162	19135.1	2973.05	–	Adverse
2019-20	18440	18468.4	28.44	–	Adverse

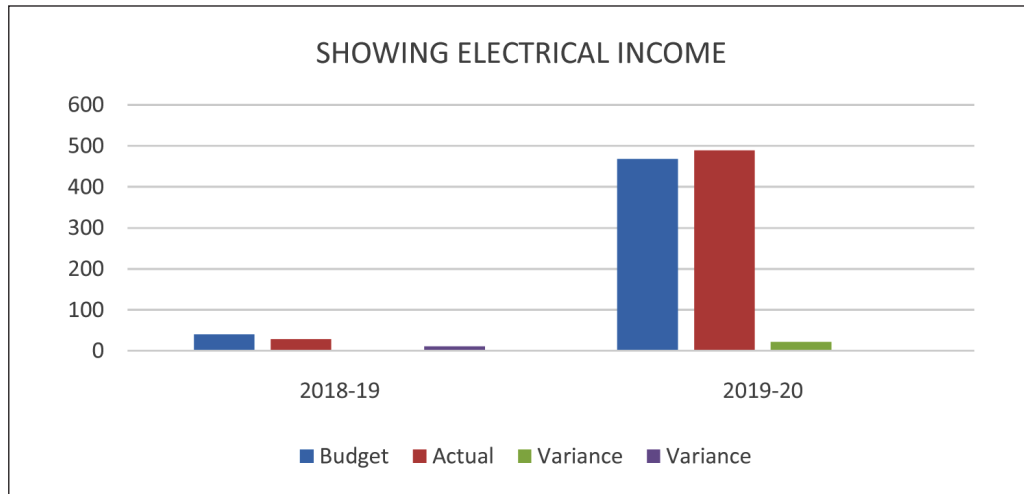
**Table-8 : SHOWING MOLASSES INCOME (In lakhs)**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	934	1042.29	108.29	–	Adverse
2017-18	994.25	1429.91	435.66	–	Adverse
2018-19	1549.5	1434.17	–	115.33	Favourable
2019-20	1662	2330.18	668.18	–	Adverse



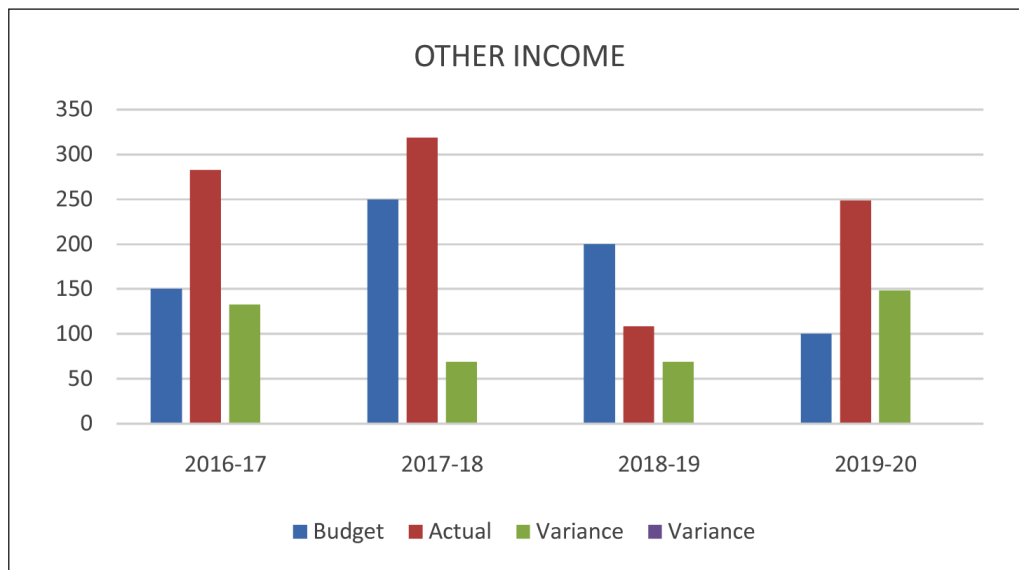
**Table-9 : SHOWING ELECTRICAL INCOME (In lakhs)**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	–	–	–	–	–
2017-18	350	–	–	–	–
2018-19	39	28.5	–	10.5	Favorable
2019-20	468	489.12	21.12	–	Adverse



**Table-10 : OTHER INCOME**

Year	Budget	Actual	Variance		Remark
			Incr.	Decr.	
2016-17	150	282.59	132.59	–	Adverse
2017-18	250	318.81	68.81	–	Adverse
2018-19	200	108.31	68.81	–	Adverse
2019-20	100	248.29	148.29	–	Adverse



**THE KRISHNA SAHAKARI SAKKARE KARKHANE NIYAMITA ATHANI  
COMPARISON BETWEEN BUDGET AND ACUTAL RESULT  
FOR THE YEAR 2016-17 & 2017-18.**

Sl.No.	Particular	2016-2017		2017-2018	
		Budgeted	Actual	Budgeted	Actual
<b>A</b>	<b>Production Exp</b>				
	Cane purchase	10800.00	10747.02	12600.00	13278.12
	Harvesting, Transportation & Exp Incurred on Cane	1821.00	1817.64	2500.00	2287.57
	Cane Purchase Tax	450.00	403.02	525.00	435.15
	Wages & Salaries of Production Dept	315.00	317.79	340.00	512.22
	Sugar Process Exp (Chemical)	130.00	133.27	160.00	187.45
	Packing Charges	350.00	321.04	430.00	396.45
	Electricity, Fuel Fire Wood Exp	50.00	42.40	56.00	54.98
	Manufacturing & Other Exp	72.00	63.20	85.00	112.36



	Machinery Repair & Maintenance Exp	460.00	335.14	475.00	602.87
	Total (A)	14448	14180.52	17171.00	17867.17
<b>B</b>	<b>Administration Exp</b>				
	Administration Staff Exp	170.00	137.79	230.00	106.93
	Tour Exp	12.00	7.72	15.00	10.36
	Vehicles Maintenance Exp	27.50	28.47	37.00	28.26
	Administrative Exp	37.60	10.41	25.00	39.79
	Meeting & AGM Exp	6.00	7.06	7.50	10.11
	Interest on Loans	551.75	308.32	650.00	558.90
	Insurance Exp	23.00	20.78	30.00	22.70
	Social Exp	10.00			
	Rent Taxes & fees	55.00	246.96	650.00	33.04
	Transportation Exp	18.00	27.19	50.00	18.15
	Other Exp	38.00	75.99	60.00	86.11
	Sugar Fluctuation Found	500		1050.00	
	Total (B)	1448.85	870.69	2804.50	1214.35
	Total Exp (A& B)	15896.85	15051.21	19975.50	19081.52
<b>C</b>	<b>Incomes</b>				
	Production on Sugar	15816.15	15482.65	19680.40	18380.80
	Molasses & other Exp	934.00	1042.29	994.25	1429.91
	Income on Cages			350.00	
	Other Income	150	282.59	250.00	318.81
	Total (C)	16900.15	16807.53	21274.65	20129.52
	Profit & Loss [C- (A& B)] Before Depreciation	1003.30	1756.32	1299.15	1857.91
	Depreciation on Plant & Machinery	400	308.30	575.00	717.84

**THE KRISHNASAHAKARISAKKARIKARKHANE ATHANI  
COMPARISON BETWEEN BUDGET AND ACTUAL RESULT  
FOR THE YEAR 2018-19 & 2019-20**

Sl.No.	Particular	2018-2019		2019-20	
		Budgeted	Actual	Budgeted	Actual
<b>A</b>	<b>Production Exp</b>				
	A) Canepurchase	9900.00	10631.15	11000.00	13147.78
	B) Proposed Cane Purchase	1575.00	1622.05	1100.00	
	Harvesting, Transportation & Exp Incurred on Cane	1800.00	1975.26	2365.00	27636.19
	Cane Purchase Tax	337.50	358.1	275.00	
	Wages & Salaries of Production Dept	480.00	590.61	620.00	677.78
	Sugar Process Exp (Chemical)	140.00	163.31	210.00	229.97
	Packing Charges	300.00	407.6	450.00	405.59
	Electricity, Fuel Fire Wood Exp	45.00	53.92	63.00	18.93
	Manufacturing & Other Exp	100.00	103.68	120.00	136.19
	Machinery Repair & Maintenance Exp	350.00	376.60	650.00	1179.01
	Total (A)	15027.50	16627.41	16853.00	18558.44
<b>B</b>	<b>Administration Exp</b>				
	Administration Staff Exp	120.00	180.49	210.00	162.32
	Tour Exp	12.00	7.33	12.00	9.33
	Vehicles Maintenance Exp	30.00	42.16	45.00	31.77
	Administrative Exp	45.00	50.98	60.00	63.13
	Meeting & AGM Exp	12.00	7.03	15.00	9.31
	Interest on Loans	1100.00	1195.61	1450.00	1112.20
	Insurance Exp	30.00	31.15	40.00	21.57

	Social Exp	250.00	139.78	350.00	172.21
	Rent Taxes & fees	25.00	36.41	25.00	31.32
	Transportation Exp	55.00	53.35	55.00	68.96
	Other Exp		26.62	15.00	1.85
	Sugar Fluctuation Found		217.72		
	Total (B)	1679.00	1988.63	2277.00	1683.97
	Total Exp (A& B)	16706.50	18616.04	19130.00	20242.41
<b>C</b>	<b>Incomes</b>				
	Production on Sugar	16162.00	19135.05	18440.00	18468.44
	Molasses & other Exp	1549.50	1434.17	1662.00	2330.18
	Income on Cages	39.00	28.50	468.00	489.12
	Other Income	200.00	108.31	100.00	248.29
	Total (C)	17950.50	20706.03	20670.00	21536.03
	Profit & Loss [C- (A& B)] Before Depreciation	1244.00	2089.99	1540.00	1293.62
	Depreciation on Plant & Machinery	900.00	1032.67	1025.00	1051.57
	Net Profit	344.00	1057.32	515.00	242.05

### Budgetary Control Ratio :

Three important ratios are commonly used by the management to find out whether the deviations of actual from budgeted result are favourable or otherwise. These ratios are expressed in term of Percentages. If the ratio is 100% or more than, the trend is taken as favourable. The induction is taken asunfavourable if the ratio is less than 100.

### Activity Ratio:

It is a measure of the level of activity attained over a period of time. It is obtained by expressing the number of standard hour's equivalent to the work produced asa Percentage of the budgeted hours.

$$\text{Standard hours for actual production} \times 100 / \text{Budgeted Hours}$$

### Capacity Ratio:

This ratio indicates whether and to what extent budgeted hours of are actually utilized. It shows the between the actual number hours and the maximum possible number of working hours in a budgeted period

$$\text{Actual hours worked} \times 100 / \text{Budgeted hours}$$

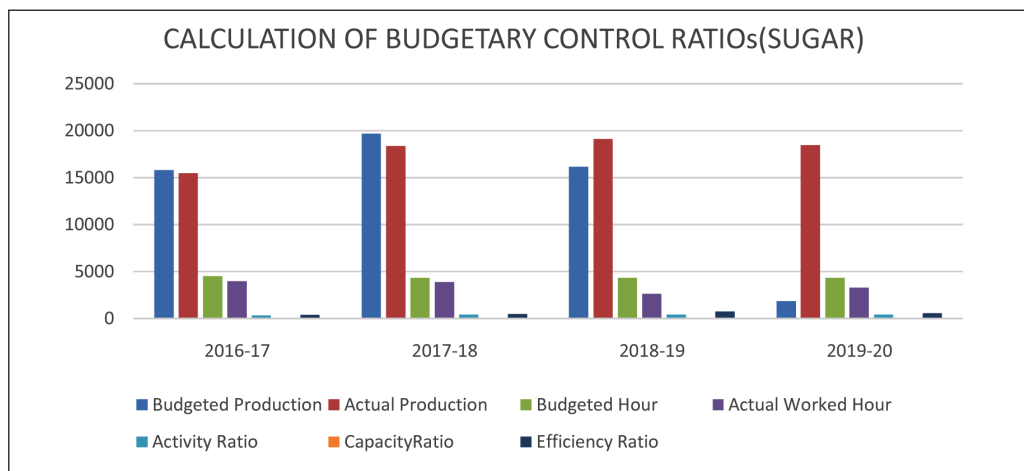
### Efficiency Ratio :

It indicates the degree of efficiency attained in production. It is obtained by expressing the standard hours equivalent to the work produced as the actual hours spent in producing that work.

$$\text{Standard hours for actual production} \times 100 / \text{Actual hours worked}$$

### Calculation of Budgetary Control Ratio (Sugar) :

Year	Budgeted Production	Actual Production	Budgeted Hour	Actual Worked Hour	Activity Ratio	Capacity Ratio	Efficiency Ratio
2016-17	15816.15	15482.65	4500	3960	344.058	88	390.97
2017-18	19680.4	18380.8	4320	3864	425.48	89.44	475.69
2018-19	16162	19135.05	4320	2616	407.35	60.55	731.46
2019-20	1844	18468.44	4320	3288	427.51	76.11	561.69



## **Findings and Suggestion:**

### **Findings:**

According to my study conducted on the budgetary control of KSSKN, the following points have been found :

1. The KSSKN follows current and fixed budget.
2. The KSSKN Production expense 2016-17 it increased 3686.65 lakh compared to the previous year.
3. The KSSKN administration expenses 2016-17 it increased 343.66 lakh compared to the previous year.
4. The KSSKN income 2016-17 it increased 3321.99 lakh compared to the previous year.

### **Suggestion:**

1. Accurate position of the business cannot be estimated: it arises due to inflationary pressure and change in Government policies all these affect the budgeting performance.
2. Performance cannot be ascertained in between the budgeted period. It is very difficult to estimate the budget performance during the course of absence.

### **Conclusion:**

By conducting the organizational study, it was found that all the departments were actively working towards the achievement of the goals and objectives of the company. The management is also efficient in the work, so the company is achieving great progress year by year. This project gave me an insight as to how the industry work and how important this sector is to the economy. This project gave me a thorough experience of the sugar industry.

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[www.sugaronline.com](http://www.sugaronline.com)

[krisnasugar@gmail.com](mailto:krisnasugar@gmail.com)



# Insurance Products Design and the Development – A Strategic Role of Insurance Actuary

BHEEMANAGOUDA AND RAGHAVENDRA K S

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**Abstract :** *Several critical roles come into play regarding the smooth functioning of the insurance sector business. One such significant role is of an Insurance Actuary who is a specialist in evaluating financial risks to calculate a suitable premium for products. The predication of future financial scenarios will be done by the application theory of probability, statistics and mathematics. This results in the estimation of appropriate premiums to minimize the risks for insurance companies by considering several key product development factors. This paper aims at understanding the role of insurance actuary in new product design and development process and the study analyzed the opinion of 85 actuarial professionals about prerequisites for product design and development process, level of involvement and pricing strategies. The findings of the study show that the involvement of actuarial professionals is highly significant, and their strategies are much required in the insurance product development process and competition and cost driven are two important factors to be considered in setting up of price. Finally, the study concludes that the insurance actuary is key personnel who raise the confidence in risk management of insurance business.*

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**Keywords :** Insurance, Actuary, Product Design, Pricing, Strategic Role.

## I. Introduction

The strong knowledge in the area of statistics, finance and mathematical theories of an actuary will assist them in the assessment of financial risk. Actuaries in insurance business assess the risks related to financial viability and lead the companies the estimation of premia for the policies. The accurate and scientific

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premium calculation and designing such policies is important for insurer to minimize risk and earn stable returns (Mahidhara 2017). They are also helpful in assuring policyholders in the settlement of their claims.

Various factors related to the development of mortality tables and life expectancy measurement of individuals provides a clear insight to the brokers and companies in prediction and measurement of future risks. The mortality analysis is one of the major applications which are used under life assurance and property and casualty insurance business. The opinion and suggestions of actuaries in determining price of insurance policies have a very high and positive impact on future buyers of such products. For instance, the premium charged by a healthy person for his life risk coverage is much lesser than that of the unhealthy and smaller age group person is charged less than the more aged. These differences in price may encourage insurance buyers to avail insurance at a lower price and cover maximum risk.

### **The Insurance Company and Appointed Actuary**

Insurance Regulatory and Development Authority of India is a highest body to regulate the operations of insurance business in India is passed an order for the appointment of Appointed Actuary (AA) which is mandatory (Gazzet of India, 2000) for all kinds of insurance companies. As per guidelines issued, the insurer or insurance company should make available of professional expertise of actuary to manage financial risks and certainty of the insurance business and they are known as Insurance Actuary. The appointment should fulfill the following prerequisites.

#### **Criteria for the Appointment of Insurance Actuary by IRDAI**

<b>Eligibility Criteria</b>	<b>Types of Insurers</b>		
	<b>Life Insurance</b>	<b>General Insurance</b>	<b>Health Insurance</b>
1.Common Eligibility	1. A resident of India 2. Fellow member as per Actuaries Act, 2006		
2. Specific Eligibility	Qualified in life insurance specialisation and passed the Specialist Application	Qualified in general insurance specialisation and passed the	Qualified in health or general insurance specialisation and passed

	<p>subject as per IAI.</p> <p>Having knowledge and experience in statutory compliance of life insurance and a minimum 3 years of post fellowship experience.</p> <p>Having at least 5 years of post-fellowship experience with a total of 10 years service in life insurance industry.</p>	<p>Specialist Application subject as per IAI.</p> <p>Having knowledge and experience in statutory compliance of general insurance and a minimum 1 year of post fellowship experience.</p> <p>Having at least 2 years of post-fellowship experience with a total of 7 years service in general insurance industry.</p>	<p>the Specialist Application subject as per IAI.</p> <p>Having knowledge and experience in statutory compliance of general insurance and a minimum 1 year of post fellowship experience.</p> <p>Having at least 2 years of post-fellowship experience with a total of 7 years service in health or general insurance industry.</p>
3.Other Eligibility	<ul style="list-style-type: none"> <li>• Must be the employee of the insurance company.</li> <li>• Not appointed as AA of any other company.</li> <li>• Not crossed the age 65.</li> <li>• Obtained a certificate of practice from IAI.</li> <li>• Not legally found guilty of breaching professional duties.</li> </ul>		

Source: [www.irdai.gov.in](http://www.irdai.gov.in)

The person who found eligible and competitive in all manners can be appointed as AA by the IRDAI for any insurance company.

To become a qualified actuary one has to spend normally six years. During this time they will acquire knowledge of many subject areas like quantitative mathematics, statistics, finance, probability analysis, economics, risk and sensitivity analysis, risk's assessment and financial economics and so on. The strength and ability of an actuary lies in his skills used in logical and scientific analysis of problems and detail orientation.

## The Review of Literature

The role of an Actuary in insurance is very commanding and helping the industry to perform the business by managing their financial risks with innovative strategies (Team Acko, 2022). The increasing problems of leveraging a business the actuaries are called for involving in developing new risk analysis methods and newer products. The consideration of all possible data which are past, present and future in establishing criteria for design and development of insurance products with attractive premiums is the crucial task for actuarial professionals in the insurance business (Lee Colquitt, 2003). The negative interest

rate policy of banks and financial institution will pose significant risks to the insurance industry in the future (Mark E. Alberts, 2020).

In the individual insurance market, the consumer choice is given the top priority and the level of factors considering in designing the insurance products and its results can be seen in its market share. Therefore, the products choice is highly sensitive to price (Susan Marquis, 2007). Actuarial studies covered advanced measures of determination of price to address issues related to price schedules (Marquis et.al.2004), taxation policies and its changes (Gruber et.al.1994), market responses to hypothetical questions about consumer purchase decisions (Marquis and Buchanan 1992). Actuarial professionals have created a big impact on insurance market's development and traditionally they have played a key role in product design and development in many of the world's leading insurance markets. The ideas on which they design and develop the insurance products will clearly explain the wordings like financial structures, product feasibility, conditions would apply, benefits to prospective buyers if they could buy. But the dearth of actuarial professionals and the increased complexity of product making may be the biggest threat to the development of the insurance market. (David Heeney et.al.).

## **II. Problem Statement**

The appointment of actuarial professionals is need of the hour for life, general insurance and other insurance companies (Chris Daykin, 1999). Based on the availability of actuaries and the insurance firm's capacity to hire, they will be either appointed as full-time basis or will be taking consulting services when required. Actuaries are an integral part of every insurance company, and their role is to determine premium amounts. The role of actuary is more in designing attractive products/ services and helping companies to charge reasonably scientific premium to perform and sustain in the long run. This definitely helps companies remain competitive with other insurance companies and maintain profits. The dearth of actuarial professionals (Hari Narayan J, 2009) and the failure of insurance companies in hiring their services for making product design and development process and risk management may result in financial loss and loss of the insurance market. This research is undertaken with the background that the success of insurance business depends upon the involvement of actuaries in design and development of insurance product process and consideration of the prevailing factors which help in the estimation of the premium of insurance products and analysis of future risk.

### **III. Objectives**

**The study aims at:**

1. Analyzing the factors to be considered in design and the development of insurance products.
2. Examination of factors driven in strategic pricing by actuary, and
3. Determining the involvement of actuarial professionals in product development process.

### **IV. Methodology**

The study is based on primary data that are collected from 85 sample respondents (25 Fellow Actuaries and 60 Actuarial Students and Actuarial Analysts) by administering a well-structured questionnaire on them. The questions were close-ended with multiple options. The questionnaire tool has been used because the study is of a single sector, i.e., insurance. Secondary data are gathered from published relevant articles, unpublished materials and different websites to support the study.

The five-point response category of Likert type scale (Likert, 1932) pertaining to respondent responses has been used. Five-point responses are quantified by allocating numerical value 1 for Strongly Disagree (SD) and 5 for Strongly Agree (SA) with the questions.

### **V. Results and Findings**

#### **i) Factors to be considered for design and development of insurance products**

Actuaries are essentially expertise in designing and developing insurance products by assessing rigorously associated risk factors. Though the new products are designed with the customer mind, a large number of dynamic factors are considered in the process of development of new products to control the price. To be precise, in understanding the factors influencing on the insurance product's development and the extent of dependency on those is analyzed hereunder:

The process of designing and the development of insurance product are more or less similar with other products process in the business. It is undergoing with a long process, wherein actuaries identify, evaluate and analyze the factors which are significant and relevant in the decision making process. For this purpose 18 factors are identified and analyzed.

The Low interest rate is a factor which has an impact in the design and development process of insurance products. Low interest rates is directly effecting on the policyholders performance and becoming very less attractive because of lower returns of products. The performance of total portfolio is also based on interest rate in the market. Legal approvals and regulatory adherence are to be considered important in insurance development plan. The procedure laid down by IRDAI from time to time is to be followed by insurer for smooth conducting of business. Further, characteristics of various generations of the prospective consumers play a vital role in the product development process. A baby boomer is a person born between 1944 and 1964 that is right after the Second World War and is considered very strong and ethical. The next category is Generation X who born between year 1965 and 1979 that are assumed to be very interested in understanding of marketing and media. Generation Y are known as millennial born between year 1980 and 1995 and are also considered as children of baby boomers who are treated as internet generations. They have access to digital and electronics and are confident and achievement oriented. Generation Z people are born between 1995 to till date. This category of people have think extremely different from others and very creative generation. This generation has been labeled lazy, entitled, and narcissistic.

Another factor identified in the study is Predictive modeling which helps in due consideration and analysis of huge volume of data to draw interpretations and establishes relationship for the prediction of future events after considering the past and present. The function of underwriting, pricing, rating and claims, marketing and reserving in insurance business is scientifically executing by the actuaries with the help of these models. Customers are looking for convenience and value for money and require easy possession of insurance products. To make it more convenient to customers the application development setup is need of an organization. Based on the total turnover and the operational size of an organization the Middle market companies are identified for the purpose of insurance product design and development which will ensure the pricing decision will be effective. Other next level of factor affects on product planning is the market environment. Environmental analysis will be done as it is prerequisite for better utilization of resources and to be very competitive. A proactive In-force management is a key to achieve desired sales target, which also helps in creating sales operations policies and use of advance techniques of sales management and consideration of Retirement benefit factor which includes medical facilities and other deferred compensation arrangements to the insured by the insurer.

Longevity Risk refers to the risk of populations living longer. This factor affects business firms and the governments in returning the promised benefits of the schemes in the future. The premium rates of insurance policies are strongly based on mortality assessment. Mortality risk consideration helps in estimating the financial burden of insurance companies if unexpected events take place with the life of insured. The Internet of Things (IoT) is another identified factor which helps in determining the customers' expectations due to the dependency and use of technological advancements is life management. A factor like wellness program is boosting the healthy behavior of prospective insured and provides many offers and discounts on premium.

The shift in focus from profit centric to customer centric business is driving a major factor like competition management effectively. The right form of resource utilization is possible only when competition is considered as ultimate. The insurance business should be strictly adhering to the guidelines issued by the IRDAI on Solvency Capital Requirement (SCR). The adequate reserve maintenance is mandatory to continue the business operations are the major challenge for insurer. Insurance product design and development process is encountering another problem related to understanding of customer buys in period. The process and stages used in product development is different with each company and some of the products are successful only for a short period of time and other stay a long period in the market.

The mean score of all the variables considered in this study is more than 3.0 and the average mean score rounding to 4. It can be inferred that the respondents to this questionnaire seem to have a slightly positive opinion towards consideration of the selected factors with regard to insurance product design and development process. From the analysis it is observed that the factors like regulations, mortality risks, capital requirements, the low interest rate and customer buys in period will be considered at a higher level while designing and pricing insurance products by the actuaries. However, other factors chosen in the study are also to be considered according to their impact and influence during the time of design, development and premium fixation.

On the one hand price is subject to regulations that limit how many companies can charge to customers and the company's performance and liability management. On the other's side the role of actuary is to determine the lowest possible premium that satisfies both the business and regulatory objectives. It can be effective only on consideration of all external and internal factors that determine the cost and price along with high volumes of data. The application

**Table-1 : Respondents Opinion on the Factors to be Considered in Design and Development of Insurance Product**

Sl. No.	Factors	Fellow Actuaries, SA and AAs						Mean Score	Average Mean Score
		Respondents							
		SA(5)	A(4)	N(3)	DA(2)	SDA(1)	Total		
01	Low interest rate	16(19)	63 (74)	6 (7)	0	0	85	4.117	<b>3.838</b>
02	Regulation	40 (47)	39 (45)	3 (4)	3(4)	0	85	4.364	
03	Baby Boomers	12 (14)	38 (44)	21 (25)	14(17)	0	85	3.705	
04	Generation X	5 (6)	46 (54)	18 (22)	13(15)	3 (4)	85	3.43	
05	Generation Y(Millennial)	0	47 (55)	25 (30)	11 (12)	2 (2)	85	3.376	
06	Generation Z	41 (47)	8 (10)	15 (18)	21 (25)	0	85	3.81	
07	Predictive Modelling	22(25)	45(54)	6 (7)	10 (12)	2 (2)	85	3.88	
08	Application Development	17 (20)	42 (48)	14 (17)	7 (8)	5 (7)	85	3.694	
09	Middle Market	5(7)	53 (62)	16 (19)	11(12)	0	85	3.611	
10	In Force Management	6 (7)	45 (53)	22 (25)	9 (11)	3 (4)	85	3.494	
11	Other Retirement Benefits	11 (14)	56 (66)	8 (10)	7 (8)	3 (4)	85	3.764	
12	Longevity Risks	21 (25)	38 (44)	21 (25)	5(7)	0	85	3.88	
13	Mortality Risks	40(46)	37 (43)	3(4)	5 (7)	0	85	4.317	
14	Internet	9 (11)	55 (63)	11 (12)	8 (10)	2 (2)	85	3.717	
15	Wellness Program	13(17)	45 (60)	22 (16)	5 (8)	0	85	3.776	
16	Competition	18 (24)	44 (53)	16 (19)	3 (4)	4 (4)	85	3.811	
17	Capital requirements	43 (51)	28 (32)	9 (11)	5 (6)	0	85	4.282	
18	Customer buys in Period	33 (38)	33 (38)	11(12)	5 (6)	5(6)	85	4.058	

Source: primary data

Notes :

1. SA – Strongly Agree; A – Agree; N – Neutral; DA – Disagree; SDA – Strongly Disagree
2. Figures in Parentheses refer to percentage of respondent.

of different actuarial models like linear, clustering, regression trees also ensure the rate making is scientific and effective.

## ii) Key pricing factors in design and development of insurance products

The global insurance market is under stiff competition and the insurer is trying to achieve competitive advantages. The pricing factor has become very significant in achieving this. Due to the difficulties in consideration of factors related to insurance's rate making, many companies are still trying to find the right balance in their pricing schemes. The insurer need to maintain existing customers and look forward for prospective business and for these purposes the schemes must also be sufficiently robust to overcome severe cost challenges. On the one hand few insurance companies facing problems with developing competitive price strategy and delivering it due to price increases and other side few companies faces overcapacity in their markets which is driving prices down. However, the increased judgmental behavior and price sensitive attitude of the customer in the dynamic markets is a great challenge ahead with every insurance marketer. Above all, today's customers enjoy the least expensive deal because of transparency in the pricing mechanism which is witnessed due to entry of direct players and price aggregators.

The table 2 provides respondent fellow actuaries and student actuaries and the analyst's opinion about the driving factors in pricing strategies by insurance companies.

**Table-2 : Respondents' Views on Key Factors of Insurance Pricing Strategy**

Key Pricing Factors	Fellow Actuaries and SA &AAs	
	No. of Respondents	Percentage
Customer Driven	13	15
Competition Driven	36	42
Cost Driven	21	25
Actuarial Principle Driven	15	18
Total	85	100

Source : Primary data.

According to the data in table 2 about key factors of pricing strategy, the competition driven factors are among top priority by the price makers and insurers followed by Cost driven factors which are considered most significant. However, factors driven by actuarial principles and customer are the next line



of factors to be considered while fixing premiums and other charges for insurance products/services.

Insurance companies can improve their pricing strategies and price realization practices through different initiatives. The improvement in portfolio price management, sharpening a new business pricing system, price variation control, a right adjustment in company goals and price, consideration of competitors pricing policy and customer opinion and overall development of organization structure are different such imperatives on which the insurance companies must work on.

### **iii) Various insurance product development process and Actuaries involvement**

Insurance companies are undertaking various functions in its establishment and these functions are to be performed with due diligence. The performance of all the functions it undertakes depends upon the level of use of technology and skilled human resources. Actuaries are the experts who provide professional and quality services and ensure the solvency and prosperity of insurance companies. The regulations issued by the insurance regulators to be followed on account of maintaining corporate governance and practicing all the guidelines may be only possible if insurance firms are guided and supervised by the actuaries.

The nature of insurance business is demanding greater participation of insurance actuary in all the product design and development process directly or indirectly (Subramanyam et.al 2013, Quakiser 2010). This highlights the need of actuary's involvement and why insurance business is inseparable one from their involvement.

Therefore a detailed analysis is made by considering the following 16 different product development process/functions and further analyzed the opinion of respondents.

The insurance product development normally starts with idea generation. The development of products should witness the creative ideas and strategies for execution of business. The creative minds develop creative ideas and actuaries are pioneer in that. Likewise, Feasibility study help in understanding whether sales, cost of installation, future expenses, required capital, expected returns and risk management through reinsurance etc. are feasible or not. An actuary makes clear assumptions and lead in providing data on the development of new and existing products. Such process must cover pricing, design, profitability, market position and new opportunities. The product development process of either new or existing must ensure the life of products in the market and its

cyclical advantages. Underwriting process determines the risk involved in insuring life and property and helps in calculation of standard and scientific premium for potential risk. A significant process like Assumption development is providing data on future uncertainties with the help of using theories of actuarial science and set a stage for scientific pricing of the product which is another major task of an actuary in insurance industry (Jayaram, 2006).

A legal function of insurance company is drafting of Policy form. It includes technical details and different clauses for interpretations of the terms used in form. Actuaries are found to be suitable professionals in drafting this form as they are highly knowledgeable on these matters. The outflow of huge money from insurance companies for giving legal benefits and compensation for claim, the designing and construction of the compensation plan is highly difficult and challenging. The reinsurance is helping insurers to manage the burden of risk and transfer such risk to third parties with the help of actuarial valuation on reinsurance requirement. The business of the century is leading by Information technology and the application of technology driven factors result in cost and service management effective and efficient. A detailed review work by an actuary in insurance business will strengthen the confidence in implementation of such reviewed works is called peer review in insurance business. The public interest can be protected with due diligence if actuarial practices is efficiently used in all level of implementation of decisions.

A comprehensive marketing plan will lead organization in facing greater challenges and achieving sustainable growth. The execution task of every decision is expecting actuary's approval and seeking directions for implementation. The training helps in bringing best among us the learned actuaries can train other actuarial professionals at various levels to make their team more efficient. The change is part and partial of everything and change is continuous and very fast. Insurance business needs to look future and make necessary updates in its business programs and process from time to time. The regulatory compliance is part of every business operations today. The developing changes in the financial reporting for contracts and insurance enterprises require professionals' services and consent. A tracking provides thorough knowledge of life and annuity products and its requirements. Actuaries equipped to tackle challenges for companies in a global economy and in this field they ensure the stability of organizations by properly designing, pricing and reserving these often complex products.

Hence, the study focused on analysis of actuaries' involvement in various insurance functions and the level of involvement.

**Table-3 : Respondents Opinion about Actuary's Involvement in Insurance Product Development Process**

Sl. No.	Insurance Product Development Process	Fellow Actuaries and SA & AAs							Mean Score	Average Mean Score
		Respondents								
		HI(5)	SI(4)	N(3)	NI(2)	NRI(1)	Total			
01	Idea Generation	77 (92)	5 (8)	0	3 (5)	0	85	4.835	4.350	
02	Product Concept and Feasibility	64 (64)	18(36)	0	0	3 (5)	85	4.670		
03	Product Planning and Design	69 (72)	13 (28)	3 (5)	0	0	85	4.776		
04	Underwriting Criteria	33 (24)	50 (68)	2 (8)	0	0	85	4.364		
05	Assumption Development	70 (76)	12 (24)	3 (5)	0	0	85	4.788		
06	Product Pricing	72 (84)	13 (16)	0	0	0	85	4.847		
07	Policy Form drafting	49 (40)	31 (52)	0	2 (8)	3 (5)	85	4.423		
08	Set Compensation Levels	53 (68)	24 (24)	6 (10)	2(8)	0	85	4.505		
09	Reinsurance	56 (68)	26 (32)	3 (5)	0	0	85	4.623		
10	Information Technology	44 (32)	23 (44)	10 (16)	8 (8)	0	85	4.211		
11	Peer Review	37 (52)	42 (48)	3 (5)	3 (5)	0	85	4.329		
12	Marketing Plans	26 (32)	10 (16)	12 (36)	25 (16)	12(20)	85	3.152		
13	Training	27 (48)	15 (24)	9 (12)	28 (16)	6 (10)	85	3.341		
14	Update Business Procedures	31 (40)	29 (44)	6 (10)	10 (16)	9 (15)	85	3.741		
15	Regulatory Filing	66 (84)	13 (16)	0	3(5)	3(5)	85	4.600		
16	Tracking in force	49 (52)	23 (40)	11 (8)	2 (8)	0	85	4.400		

Source: primary data

Notes: 1. HI- Highly Involved, SI-Sometimes Involved, N-Neutral, NI-Not Involved, NRI-Never Involved.

2. Figures in Parentheses refer to percentage of respondents.

Table-3 depicts the actuary's involvement level in insurance functions according to the opinion of respondent Fellow Actuaries, Student Actuaries and Actuarial Analysts.

The mean score in all the variables considered in this study is more than 3.0 and the average mean score rounding down to 4, it can be inferred that the respondents to this questionnaire seem to have a strong positive opinion towards actuarial professionals involvement in the listed product development processes with regard to insurance product design and development. From the analysis it can be said that the process like product pricing, the idea generation, underwriting, product planning, pricing, the assumption's development, product concept's development and feasibility checking, regulatory procedure filing, the high degree of involvement of actuaries is needed. In the process like marketing plans and training, the actuarial professional's involvement is not found very significant and does not require their key attention as these activities can be better performed by other experts.

Considering the all-round effectiveness, Insurers are likely to be tasked with eliminating or minimizing friction throughout their business models, processes and infrastructure. It is well-known fact in the present days that the direct and indirect presence and involvement of actuaries certainly bring in success.

## **VI. The Conclusion**

The present study on insurance products design and the development-A strategic role of insurance actuary was conducted to analyze and understand the need of insurance actuary and their strategic role in pricing insurance products. The involvement and importance of actuaries in the light of the growing price competitiveness and regulatory compliance is also covered in the study. The result indicates that the insurance company's efficiency and performance is largely depends upon the involvement of actuarial professionals in product design and development process and the use of their services in strategic decision making process. Indeed, it is obvious .....

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# Digitalisation Improve the Financial Performance of the Banking Sector : Myth or Reality

SHRADDHA THAKUR AND ARVIND KUMAR

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**Abstract :** *Technology's advancement has sparked sophisticated digital transformation, which isn't only limited to firms with a tech-savvy workforce but also high-tech, well-established organisations that have started their own digital transformation initiatives. Digitalization is a paradigm shift that inevitably has an impact on the most established companies and even has a negative impact on society as a whole. It is vital to note that digitalisation has disrupted major industries, including retail, media, transportation, and massive enterprises, and it is presently affecting Indian commercial banks. The Indian commercial bank's transition to digital banking has spawned new business models, or new concepts for growth and development across a range of domains, including internet banking, mobile banking, and financial transactions. In order to satisfy the increasingly complicated needs and problems of globalisation, this has continued to expand and displace traditional banking services for the consumers. The Indian banking and financial industry has been observed that significant changes and advancement over the past few years which instigated to study the relationship between digitalisation and financial performance of banking industry. The main objective of the study is to evaluate the impact of Digitalization on the performance of selected Public and Private sector banks in India. For the purpose of study, taken the sample of ten public sector banks in India which comprises five Public Sector Bank and five Private Sector Bank. The time period of study has been divided into parts- Pre Digitalisation Era (2013-17) and Post Digitalisation Era (2018-22). The result of study evidenced that there is no significant difference in the pre and post digitalisation on the financial performance of the selected Public and Private Sector Banks. Thus, it can be said that myth prevails in the economy in relation to digitalisation improves the performance of the banking sector. It is suggested that banks must integrate cutting-edge technology from overseas and provide ongoing training to employees so that they can easily adjust to changes and boosted-up the staff productivity.*

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**Keywords :** Digitalisation, Myth or Reality, Demonetisation, Financial Performance, Indian Banking Industry.

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## **Introduction**

Digitalization has become crucial as businesses and organisations, including commercial banks, strive to adopt better and more efficient ways to provide services to its clients and regular consumers. It is important to emphasise that certain financial institutions still view the entire process of digitization as troublesome and challenging, despite the evident transition to digitalized ways of service supply and delivery to enhance their market share and to fight the intense competition. The financial sector has benefited from the development of information and communication technologies, particularly in the areas of risk management, increased productivity, and support for banking services. Financial institutions have been encouraged to increase their investments in the process of digitization.

Business interactions have evolved as a result of technology. This has enabled supply chains, autonomous structures, outsourced manufacturing, and contract warehousing and delivery, as well as reconfiguring design, marketing, production, delivery, and services. Technology's advancement has sparked sophisticated digital transformation, which isn't only limited to firms with a tech-savvy workforce but also high-tech, well-established organisations that have started their own digital transformation initiatives.

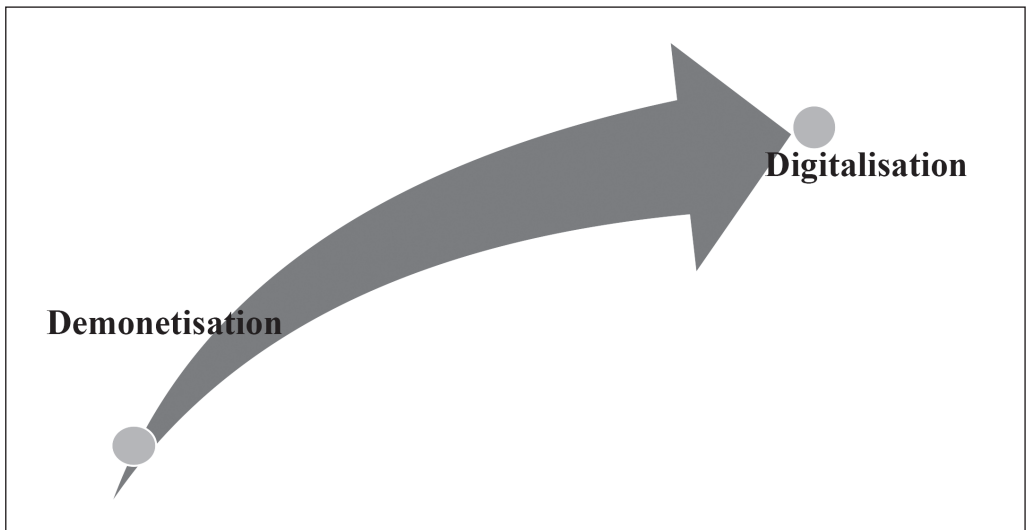
Digitalisation is a paradigm shift that inevitably has an impact on the most established companies and even has a negative impact on society as a whole. It is vital to note that digitalisation has disrupted major industries, including retail, media, transportation, and massive enterprises, and it is presently affecting Indian commercial banks.

Despite the fact that the digitalisation trend has been around for a while, recent years seem to have seen particularly remarkable effects and rates of change. The banking sector and its working conditions have been altered by digitalisation. While it is crucial to note that financial services have been automated for a considerable amount of time, a more drastic transformation may have been put off since most financial institutions wanted to preserve their conventional financial modes of services.

The partnership between commercial banks and clients has also increased as a consequence of technology advancements and digitization, which has resulted in better methods for transactions. This rapid transformation can be seen in the banking industry, where digitization has provided banks more creative methods to reach out to potential customers while also assisting them in improving their

services. Internet and mobile banking have emerged as the two most effective channels for contacting clients and enabling them to handle their own financial needs as a result of digitalization in the banking sector.

The Indian commercial bank's transition to digital banking has spawned new business models, or new concepts for growth and development across a range of domains, including internet banking, mobile banking, and financial transactions. In order to satisfy the increasingly complicated needs and problems of globalisation, this has continued to expand and displace traditional banking services for the consumers. The banking and financial industry in India has seen significant changes and advancement over the past few years.



In November 2016, high value notes of Rs.500 and Rs.1000 were abruptly removed, wiping away around 86 percent of the entire amount of money in circulation. Even if the act of demonetization was not unique in its own history, the manner in which it was carried out caught many by surprise and received harsh condemnation from both the academic community and the general public. Initially intended to stop the flow of black money, money used to finance terrorism, and counterfeiting, demonetization is now seen as the government's push towards digitalization. Since then, the original goals have fallen by the wayside in favour of encouraging India to become a cashless society. Demonetisation is portrayed by the government as the magic wand that will transform society into a cashless one. The administration even appears to have



forgotten in its rush both the infrastructure required to realise the “ideal” of a cashless society and the cash-dependent character of the people. After demonetization, the Indian government and Reserve Bank of India appear to encourage the usage of digital payments. Five transactional methods in particular are being emphasised more and more. These include debit cards, mobile wallets, Aadhaar Enabled Payment System (AEPS), Unified Payment Interface (UPI), Unstructured Supplementary Service Data (USSD), and mobile wallets which led to the emergence of technology.

## **Literature Review**

(2022) Denys Krylov et.al titled “Modern Tendencies of Digitalization of the Financial Services Sphere” The result of study witnessed that digitization measures have a positive effect on the financial position of financial institutions and contribute to faster return on investment. The study opined that the highest level of competition is observed in the banking sector, where the leading participants are actively looking for new solutions and ideas and are rapidly implementing new areas of digitalization. In such a situation, banking institutions need to direct their financial, material and human resources to the long-term achievement of both strategic and tactical goals, which are formed under the influence of environmental variability.

(2021) Vira Druhova<sup>1</sup>, Oleksandra Hirna, Vira Fostyak titled “A Factor Analysis of the Impact of Digitalisation on the Banking Industry” The results of the study showed digitalisation have a negative impact on the indicators of banking activity and also witnessed that countries with a higher level of Internet use for payments have lower returns on banking assets and have a higher share of problem assets in their portfolios. However, a comparison of the financial data of the selected banks in the year 2014 and 2017 showed a worsening of the impact of the relationships between the share of online payments and the quality of banks’ loan portfolio. It is therefore appropriate for banks to use digital technologies not only to increase sales and improve the quality of customer service but also to improve scoring and financial monitoring systems.

(2020) Shujaat Naeem Azmi et.al titled “Impact of Digitalisation on Bank Performance: A Study of Indian Banks” The result of study indicates that Digitalisation is found to be positively associated with all three variables i.e., profitability, cost and efficiency under the study. It has improved bank performance and allowed it to expand from core banking services to complete financial solutions. Thus, Digitalisation has proved to be a strategic tool for reducing cost of operations for banks. However, banks have borne considerable

costs for providing digital banking services in the form of infrastructural and training costs.

(2020) Pooja Panchani titled “Digitalisation in Indian Banking: A Keen Role of Fin-Tech in Indian Banking Sector towards Digitalisation”. The study opined that with the emergence of digitalisation of Indian economy and move to turn India into cashless society, e-banking is going to be strengthened. Fin-Tech is one such path-breaking frugal area, which will address the issues in access and use of financial services without geographic constraints. Banks and Fin-Tech companies are playing a vital role in providing services to the customers in terms various cashless payments. Economical Innovations that are sustainable and accessible will be able to generate more revenue and increase firm value while significantly reducing the resource requirements, cost and thereby enriches the environment.

(2019) Vijayalakshmi B and Jayalakshmi M titled “A study on digital transactions impact on financial performance of banking sector with reference to SBI and ICICI Bank” The study viewed that Technology is going to hold the keys to future of banking. So, banks should try to find out the trigger of change. Indian Banks need to focus on swift and continued infusion of technology. The study witnessed that technology has significant positively impact on business per employee of SBI and ICICI Bank and also find out that technology has significantly positively impacted the profitability of ICICI bank but in case of SBI it is discovered that technology doesn't significantly impact the profitability.

## **Research Gap**

- After getting through a number of studies associated with the subject, it has been figured out that though many researchers have concentrated on various issues connected with the Digitalisation but still there is a considerable scope for the present study to find out that there is m myth or reality in relation to digitalisation improve the financial performance of banks.
- But until now no one study has made an attempt to comparatively evaluate the impact of Digitalization on the Indian banking sector performance in the pre and post digitalisation era.

Thus, the present study is an important venture for studying, measuring and comparing the impact of Digitalization on the selected public and private sector commercial banks in India and offer suggestions on the basis of the findings.

On the basis of research gap the following objectives and the relevant hypothesis are taken into account.

### **Objectives of Study**

The main objective of the study is to evaluate the impact of Digitalization on the performance of selected Public and Private sector banks in India. In this broader framework, the following are the specific objectives of the study :

1. To study a variation of the working pattern in pre and post digitalization of banks.
2. To analyse the digitalisation practises adopted by the selected public and private sector banks.
3. To offer suggestions on the basis of finding so that to meet the dynamics of digitalisation adopted by the banks.

### **Hypothesis of Study**

**H<sub>01</sub>** : There is significant difference in the pre and post digitalisation on the financial performance of the Selected Public Sector Banks.

**H<sub>11</sub>** : There is significant difference in the pre and post digitalisation on the financial performance of the Selected Public Sector Banks.

**H<sub>02</sub>**: There is no significant difference in the pre and post digitalisation on the financial performance of the selected Private Sector Banks.

**H<sub>12</sub>** : There is significant difference in the pre and There is no significant difference in the pre and post digitalisation on the financial performance of the selected Public Sector banks post digitalisation on the financial performance of the Selected Private Sector Bank.

### **Research Methodology**

#### **Problem Statement :**

An analytical study of digitalisation and its impact on the bank performance: A comparative study of selected public and private sector bank.

#### **Research Design :**

The proposed study will be constructed on the analytical research design. Analytical research is a specific type of research that involves critical thinking

skills and the evaluation of facts and information relative to the research being conducted.

### **Sample Profile :**

The sample comprises of total ten Indian banks which comprises five public sector banks are: SBI, Canara Bank, PNB, BOB and UBI on the other hand the study also incorporate the five private sector bank which are: ICICI Bank, Axis Bank, HDFC Bank, Kotak Mahindra Bank and IndusInd Bank.

### **Sampling Technique :**

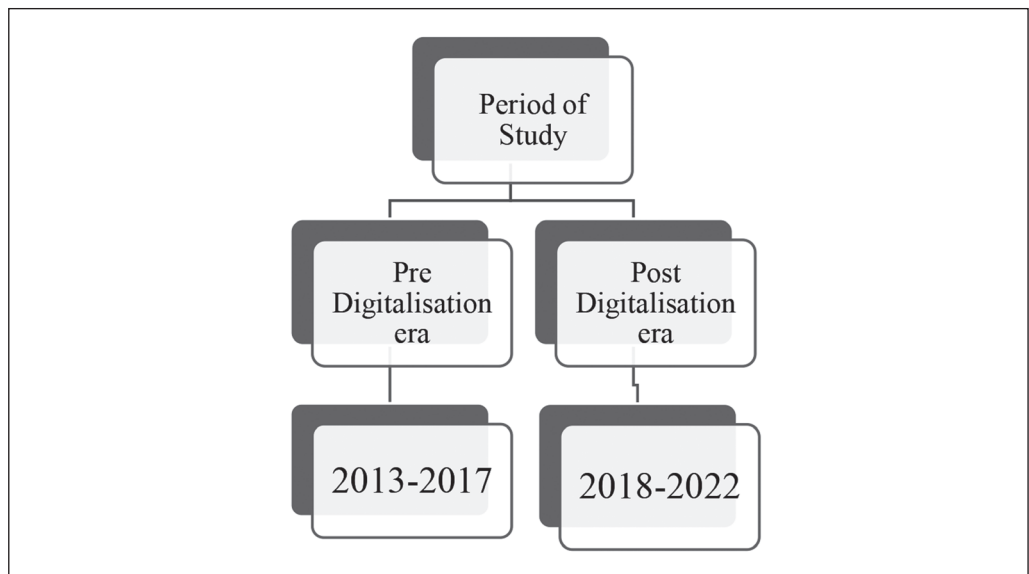
The convenience and judgemental sampling techniques have been used for the present study.

### **Sources of Data Collection :**

The secondary sources of data collection i.e., RBI bulletins, Annual report, manual, websites and official records of the selected banks are taken into consideration for the present study.

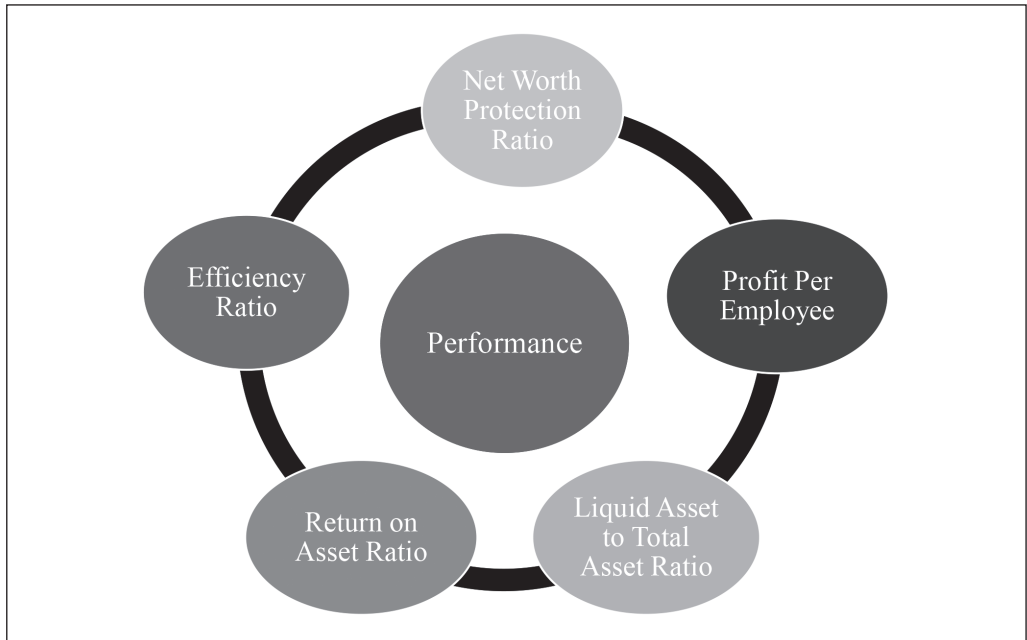
### **Period of Study :**

For the purpose of study, the period has been bifurcated into two sub-head is pre digitalisation and post digitalisation era.



## Parameters of Study

For the attaining the objectives of study, the following parameters is taken into account :



## Limitations of Study

1. The present study ignores the impact of changes in accounting policies and method adopted by the selected banks.
2. The study based on secondary data derived from RBI bulletin, websites and annual reports of selected banks.
3. The reliability and validity of the result of the findings of the present study is based upon data published by selected banks and RBI.
4. There are many approaches and parameters to evaluate the performance of selected banks which may resulted in the variation of findings.
5. This research study is time bound and only certain criteria has been taken up for study.

## Data Analysis and Interpretation

The major components of the sample banks taken for the in-depth analysis of the impact of digitalisation on the bank performance are Net Worth Protection Ratio (NWPR), Profit Per Employee, Liquid Asset to Total Asset Ratio (LATA), Return on Assets (ROA), Efficiency Ratio which are analysed as follows :

**Table No.1 : Comparative Analysis of the Net Worth Protection Ratio in the Pre and Post Digitalisation of the Selected Bank**

(in %)

Bank	Pre-Digitalisation of banks					Post digitalisation of banks				
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Public Sector Banks									
SBI	4.91	4.86	4.92	3.75	4.80	3.13	-11.90	4.56	4.79	5.05
Canara Bank	4.75	4.81	4.22	1.95	2.06	1.14	1.90	2.91	2.99	3.46
PNB	5.31	4.72	3.93	0.43	1.27	-0.99	1.90	4.23	4.15	4.61
UBI	4.47	3.71	3.37	2.19	1.02	0.16	1.25	2.99	3.47	3.90
BOB	5.08	4.54	4.44	3.15	3.20	2.77	3.88	4.34	4.78	5.68
<b>AVG</b>	<b>4.90</b>	<b>4.53</b>	<b>4.18</b>	<b>2.29</b>	<b>2.47</b>	<b>1.24</b>	<b>-0.59</b>	<b>3.81</b>	<b>4.04</b>	<b>4.54</b>
	Pre digitalisation NWPR= 3.67					Post Digitalisation NWPR= 2.60				
	Private sector banks									
ICICI Bank	12.01	11.76	11.48	10.65	9.68	8.80	9.84	9.70	11.25	11.59
AXIS BANK	9.51	9.71	9.39	9.64	7.74	6.78	6.03	8.26	9.50	9.33
HDFC Bank	8.93	8.68	10.35	10.07	10.14	9.75	11.73	10.94	11.40	11.39
Kotak Mahindra Bank	10.94	13.37	12.77	11.67	12.07	13.52	13.25	13.17	15.91	16.48
INDUSIND Bank	10.22	10.27	9.56	12.41	11.31	10.42	8.80	10.69	11.54	11.49
<b>AVG</b>	<b>10.32</b>	<b>10.76</b>	<b>10.71</b>	<b>10.89</b>	<b>10.19</b>	<b>9.85</b>	<b>9.93</b>	<b>10.55</b>	<b>11.92</b>	<b>12.06</b>
	Pre digitalisation NWPR= 10.57					Post Digitalisation NWPR= 10.86				

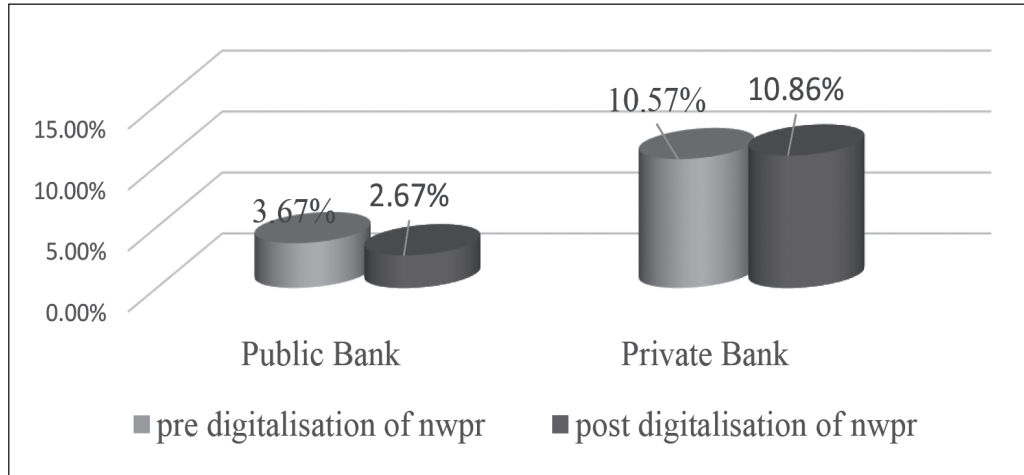
Source: Computed by the author from the Annual Report of the Selected Bank.

The NWPR ratio facilitates the simultaneous monitoring of two important elements viz. the level of non-performing assets (NPA) and equity capital. It indicates adequacy of capital to meet any incidence of NPA. Higher NPAs eats away net worth of a bank and shrinks availability of its capital. It has been calculated as below: Coverage Ratio= (Net worth-Net NPA) / (Total Assets - Intangible assets) • Total Assets of bank = Cash in hand + Balances with RBI + Balances with banks inside/outside India + Money at call + Investments + Advances + Fixed Assets + Other Assets. The Higher ratio, better is the bank, indicating availability of high amount of capital and also illustrated the higher protection to fight against volatility of risk in future scenario which doesn't hamper the normal functioning of bank and also meet expected demand of customer at times of financial emergency faced by an economy.

The above table exhibited the comparative Net Worth Protection Ratio (NWPR) in the pre and post digitalisation of the selected Public and Private sector bank. The table explains that the before digitalisation (from the year 2013 to 2017) of the selected public sector bank i.e., PNB, UBI AND BOB follows the declining trend NWPR but SBI and Canara Bank follows the fluctuating trend of NWPR. It is evidenced that the selected Public Sector Bank has witnessed the thinning the line of safety valve which has made the bank to enter in a risk averse situation. In contrast with post digitalisation of the selected public sector bank, it has been observed that NWPR has been strengthened in the case of PNB, Union Bank of India, Bank of Baroda whereas SBI and Canara Bank follows the fluctuating trend of NWPR and reveals thickening the line of safety valve that made the bank to fight all volatility which not only severally impacted the financial performance but also strengthened the competitive financial position's portfolio of bank. But in case of

The Table No.1 also explains the comparative analysis of selected Private Sector Bank's NWPR in the pre and post digitalisation era. Before implementation of digitalisation in their product and services, the ICICI Bank has been demonstrated the falling trend of NWPR which explains the inability to enhanced their safety valve on the other hand Axis Bank, HDFC Bank, Kotak Mahindra Bank and IndusInd bank has been witnessed the fluctuating trend of NWPR. On the other hand, Post Digitalisation of the selected Private Sector Bank has witnessed the fluctuating trend of NWPR which may be resulted that banks is highly volatile in relation to NWPR which may be resulted due to the declaration of high proportionate amount of Net NPA by the banks.

**Chart No. 1 : Comparative NWPR in the Pre and Post Digitalisation of the Selected Public and Private Sector Banks**



*Graphical Representation of the Table No.1.*

The NWPR of the Selected Public and Private Sector Bank has been represented by the spherical bars in the Pre and Post Digitalisation of bank. The green spherical bar represents the Pre digitalisation of NWPR in contrast with red spherical bar addressed the post digitalisation of NWPR. The above graphical chart clearly depicts that in the relation to Public Bank that NWPR has been drastically fall down but in the case of private bank it has been slightly increase of NWPR due to inclusion of technology in their products, services and business. It is also observed that public sector bank are not able to cope with technology to enhance their safety valve which help to fight against at the time of recession of an economy.

Profit Per employee is an important ratio that roughly measures how much money each employee generates for the firm. It is calculated as a company's total revenue divided by its current number of employees. It is an analytical tool because it measures how efficiently a particular firm utilizes its employees. Ideally, an organisation wants the highest ratio of revenue per employee because a higher ratio indicates greater productivity. Revenue per employee also suggests that a company is using its resources—in this case, its investment in human capital—wisely by developing workers who are very productive. Companies with high revenue-per-employee ratios are often profitable.



**Table No.2 : Comparative Analysis of the Profit Per Employee in the Pre and Post Digitalisation of the Selected Bank**

(in %)

BANK	Pre-Digitalisation of banks					Post digitalisation of banks				
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>PUBLIC SECTOR BANKS</b>										
SBI	6.18	4.89	6.14	4.79	5.00	-2.48	0.34	5.81	8.31	12.97
Canara Bank	6.73	5.00	5.01	5.21	2.01	1.18	0.59	3.81	2.90	6.53
PNB	7.50	5.10	4.48	-5.61	1.79	-16.40	-14.09	0.49	1.99	3.35
BOB	6.75	4.74	5.02	3.81	1.51	-13.96	-223.70	-30.27	3.72	6.96
UBI	10.39	12.68	6.88	-10.37	2.64	-4.42	0.78	0.65	1.01	9.19
<b>AVG</b>	7.51	6.48	5.51	-0.44	2.59	-7.22	-47.22	-3.90	3.58	7.80
<b>Pre digitalisation PPE= 4.33</b>					<b>Post Digitalisation PPE=-46.96</b>					
<b>PRIVATE SECTOR BANKS</b>										
ICICI BANK	13.41	13.58	16.85	13.48	11.83	8.19	3.88	7.99	16.40	22.05
AXIS BANK	13.67	14.66	17.42	16.40	6.50	0.46	7.55	2.19	8.41	15.30
HDFC Bank	9.74	12.44	13.39	14.04	17.25	19.81	21.49	22.45	25.91	26.11
Kotak Mahindra Bank	10.08	9.39	10.37	6.65	7.75	8.17	11.65	11.89	13.47	12.99
IndusInd Bank	9.23	9.03	9.38	9.92	11.33	14.26	11.90	14.40	9.56	13.73
<b>AVG</b>	11.22	11.82	13.48	12.10	10.93	10.18	11.29	11.78	14.75	18.04
<b>Pre digitalisation PPE= 11.91</b>					<b>Post Digitalisation PPE= 13.20</b>					

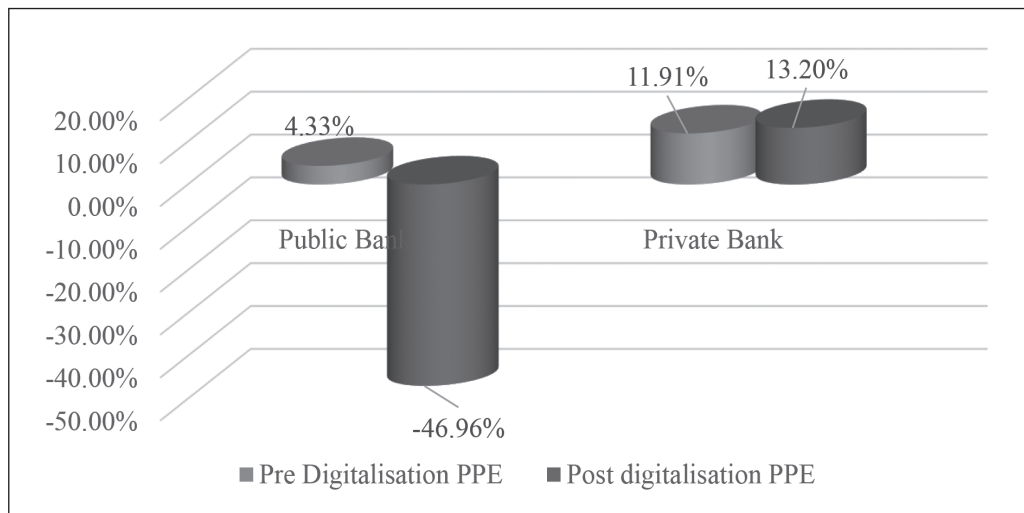
**Source: Computed by the author from the Annual Report of the Selected Bank.**

The above table exhibited the comparative Profit Per Employee (PPE) in the pre and post digitalisation of the selected Public and Private sector bank. The Table explains that before digitalisation of the selected public sector bank, follows the fluctuating trend of PPE over the period of time. In contrast with post digitalisation of the public sector bank i.e., SBI and PNB demonstrated the increasing tend of labour productivity as the bank continuously focuses on employing training programme to combat the complexity arisen due to introduction of digitalisation in the normal functioning of the business of bank.

On the other hand, Canara, BOB and UBI has witnessed the fluctuating trend of the labour's productivity that may be resulted due to the continuous resistance of the employees to adopt the changes in their working pattern and non-satisfactorily training needs of employees that impacted the performance of banks.

The table also explains the comparative analysis of Profit Per Employee (PPE) of the selected Private Sector Bank in a pre and post digitalisation of banks. Before digitalisation of private sector banks, the Profit Per Employee (PPE) has been fluctuating trend and on the other hand after digitalisation of bank the same trend follows as before but in case of HDFC there has been shows the remarkable change as the increasing trend of Profit Per Employee( PPE) indicates the favourable impact of digitalization on the labour productivity of employees.

**Chart No.2 : Comparative Profit Per Employee (PPE) in the Pre and Post Digitalisation of the Selected Public and Private Banks**



*Graphical Representation of the Table No.2.*

The Profit Per Employee (PPE) of the selected Public and Private Sector Bank has been represented by the spherical bars in the pre and post digitalisation of bank in the Chart No.4. The blue coloured bar is illustrated the pre digitalisation of PPE whereas pink coloured spherical bar represent the post digitalisation of PPE. It is observed that in the case of public sector bank, the PPE remains negative

after the introduction of digital innovation in their working pattern and operating their business. But in the case of private sector bank, it is witnessed that digitalisation has bring the slightly increase of PPE in contrast with pre digitalisation of selected bank. Thus, it is concluded that digitalisation has differently impacted the public and private sector bank that may be resulted due to lack of motivating spirit of an organisation to reduce resistance of employees, lack of the proper provision to tackle the technological adoption challenges and high cost of infrastructure to set up digitalisation in their day to day operations.

**Table No.3 : Comparative Analysis of the Liquid Asset to Total Asset Ratio (LATTA) in the Pre and Post Digitalisation of the Selected Bank**

(in %)

	Pre-Digitalisation of Banks					Post digitalisation of Banks				
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>PUBLIC SECTOR BANKS</b>										
SBI	7.33	7.39	7.56	7.10	6.36	5.55	6.04	6.35	7.57	7.91
Canara Bank	8.33	9.11	8.88	10.26	10.08	8.09	9.52	9.43	15.46	14.84
PNB	5.67	8.22	9.27	11.03	12.26	12.47	9.72	9.15	8.83	10.09
BOB	5.20	6.52	5.86	7.23	7.25	10.14	8.71	10.01	7.88	10.06
UBI	15.61	19.84	20.75	19.94	21.65	12.90	11.43	10.53	10.40	9.60
<b>AVG</b>	8.43	10.22	10.46	11.11	11.52	9.83	9.08	9.09	10.03	10.50
<b>Pre Digitalisation LATTA= 10.34</b>						<b>Post Digitalisation LATTA= 9.70</b>				
<b>PRIVATE SECTOR BANKS</b>										
	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
ICICI	7.72	6.98	6.55	8.31	9.81	9.57	8.33	10.85	10.82	11.89
AXIS Bank	6.00	7.37	7.81	6.34	8.36	6.29	8.39	10.63	6.20	9.44
HDFC Bank	6.81	5.45	6.15	5.49	5.67	11.55	6.54	5.66	6.84	7.36
Kotak Mahindra Bank	4.41	6.83	5.91	5.66	10.52	9.36	7.90	14.79	73.96	10.00
IndusInd Bank	9.34	7.78	9.88	7.22	10.43	5.96	5.03	5.21	15.52	16.98
<b>AVG</b>	6.85	6.88	7.26	6.60	8.90	8.54	7.23	9.42	22.66	11.13
<b>Pre Digitalisation LATTA=7.72</b>						<b>Post Digitalisation LATTA= 11.79</b>				

Source: Computed by the author from the Annual Report of the Selected Bank.

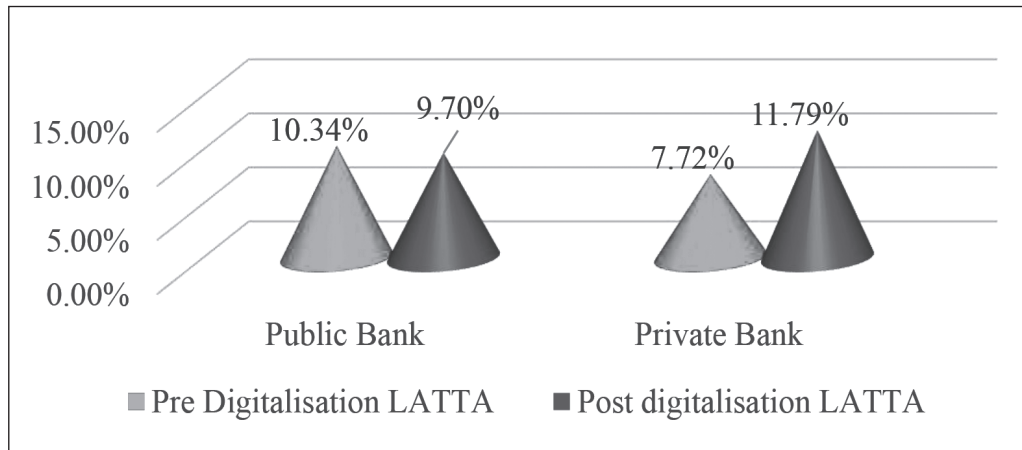
Liquid assets as a percent of total assets reflect the proportion of liquid assets in the total assets structure of banks. The presumption is that higher the proportion of liquid assets in total assets, higher would be the liquidity of bank. It should not be forgotten that liquidity is a double edged weapon and represent excess blockage of funds and thus foregoing of opportunities to earn higher profits. Liquid Assets comprises the balance maintain with RBI and balance maintain with bank which is totalled and divided to total amount of assets.

The table No.3 explains the Comparative Analysis of Liquid Assets to Total Asset ratio (LATTA) in the pre and post digitalization of selected Public and Private Sector Bank. In the case of Public sector Bank, the SBI and Canara Bank shows the fluctuating trend of LATTA but in post digitalisation SBI's LATTA was recorded a sharply fall in the initial years of the implementation of digitalisation and from the year 2020 onwards, it was recorded the increasing trend of LATTA. The PNB's LATTA before digitalisation shows the increasing trend of LATTA whereas after digitalisation the PNB's LATTA has been illustrated the highly volatile and dynamic in nature. The Bank of Baroda shows the fluctuation trend before and after digitalisation of bank but the rate of LATTA is recorded at higher rate after the implementation of digitalisation in their working pattern and operation of business through the inclusion of technology. The UBI recorded the fluctuating trend of LATTA in the era of before digitalisation but as bank introduces digitalisation, recorded the sharp decline of LATTA which pose the threat of danger as banks liquidity has been fallen from year to year.

In the case of private sector bank, the above table exhibit that before digitalisation of ICICI bank has shown the increasing trend of LATTA ratio but after digitalisation of ICICI bank shows the fluctuating trend of LATTA . The AXIS Bank, HDFC Bank, Kotak Mahindra Bank and IndusInd Bank has illustrated the fluctuating trend of LATTA in the pre and post digitalisation but it is noticed that rate of fluctuation after digitalisation of bank is comparatively more than pre digitalisation of bank.

The Liquid Asset to Total Asset ratio (LATTA) of the selected Public and Private Sector Bank has been represented by the cone in the pre and post digitalisation of bank in the Chart No.3. The pre digitalisation of Liquid Asset to Total Asset Ratio (LATTA) has been represented by red cone in contrast with post digitalisation represented by purple cone. It is observed in the case of public sector bank that digitalisation has slipped down the liquidity that may be impacted the short term efficiency of bank's performance. But, in the case of

**Chart No.3 : Comparative Liquid Asset to Total Asset Ratio (LATTA) in the Pre and Post Digitalisation of the Selected Public and Private Banks**



*Graphical Representation of the Table No.3*

private sector bank, the digital innovation has brought the positively remarkable change and bring the more liquidity which strengthen the short term performance of bank. This may be resulted due to the business expansion, strengthen infrastructure to implement the digital innovation and satisfactorily customer relationship practises through adoption technology in their ecosystem.

Return on Assets indicates the efficiency of the banks in utilizing their assets in generating profits. A higher ratio indicates the better income generating capacity on the assets and better efficiency of the management also. It is arrived at by dividing the net profit by assets, which is the Return on Assets. Thus, the ratio measures the return on assets employed. Higher ratio indicates better utilization of investment in total assets. Here, average assets mean an average of assets at the beginning & at the end of the year.

The Table No. 4 exhibited the comparative analysis of Return on Asset ratio in the pre and post digitalisation of the selected bank. The table explains that SBI has been reported the falling trend of ROA in the era of pre digitalisation of bank i.e., from the year 2013 to 2017 but after implementation of technological innovation in the operation of bank (i.e., from the year 2018 to 2022) it has recorded the fluctuating trend of SBI's ROA. The Table No.4 also depicts Canara Bank has been recorded the fluctuation trend of ROA in the pre and post

**Table No.4 : Comparative Analysis of the Return on Asset Ratio in the Pre and Post Digitalisation of Bank**

(in %)

	Pre-Digitalisation of banks					Post digitalisation of banks				
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>PUBLIC SECTOR BANKS</b>										
SBI	3.85	3.78	3.79	3.61	3.60	3.46	3.40	3.63	3.40	3.23
CANARA BANK	2.68	2.62	2.59	2.65	2.99	3.10	3.03	2.89	3.39	3.49
PNB	3.98	3.76	3.72	3.32	3.32	3.11	3.17	3.22	3.43	3.12
BOB	3.24	3.02	3.14	2.95	3.06	2.93	2.97	3.03	3.36	3.39
UBI	2.73	2.49	2.46	2.64	2.92	3.08	3.17	3.26	3.56	3.45
<b>AVG</b>	<b>3.30</b>	<b>3.14</b>	<b>3.14</b>	<b>3.03</b>	<b>3.18</b>	<b>3.14</b>	<b>3.15</b>	<b>3.21</b>	<b>3.43</b>	<b>3.34</b>
<b>Pre Digitalisation ROA=3.15</b>					<b>Post Digitalisation ROA= 3.25</b>					
<b>PRIVATE SECTOR BANKS</b>										
ICICI BANK	4.14	4.52	4.83	5.07	5.34	4.60	4.31	4.53	4.71	4.68
AXIS BANK	4.76	5.05	4.89	4.99	4.95	4.28	4.35	4.45	4.42	4.11
HDFC Bank	5.66	5.37	5.32	5.41	5.26	5.20	5.29	5.19	5.16	4.91
Kotak Mahindra Bank	5.22	5.85	5.90	4.95	5.41	5.13	5.08	5.24	5.42	5.40
INDUSIND Bank	4.91	5.49	5.34	5.58	5.73	5.53	5.22	6.19	5.53	5.57
<b>AVG</b>	<b>4.94</b>	<b>5.26</b>	<b>5.25</b>	<b>5.20</b>	<b>5.34</b>	<b>4.95</b>	<b>4.85</b>	<b>5.12</b>	<b>5.05</b>	<b>4.93</b>
<b>Pre Digitalisation ROA=5.19</b>					<b>Post Digitalisation ROA= 4.98</b>					

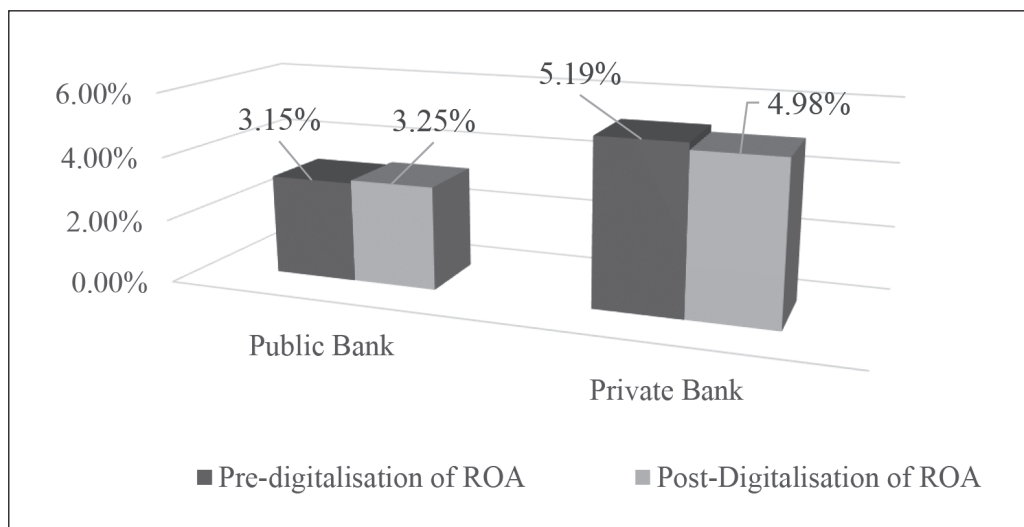
Source: Computed by the author from the Annual Report of the Selected Bank.

digitalisation of bank but rate of ROA is higher in the post digitalisation of Canara Bank. The PNB has been recoded the falling trend until the year 2015 and afterward it remains stagnant in contrast with post digitalisation of the banking operations, the PNB has witnessed the fluctuating trend of ROA. The Bank of Baroda and Union Bank of India has witnessed the fluctuating trend in the era of pre digitalisation of banking operations but after implementation of digital innovation in banking services and its products which has increased the ROA in the increasing trend.

In the case of private sector banks, the table also explains that ICICI Bank has follows the increasing trend of ROA before implementation of digital innovation

in relation to their operation of business but after implementation of digitalisation that has led to the haphazard pattern of ROA. On the other hand, AXIS Bank, HDFC Bank, Kotak Mahindra bank and IndusInd bank has reported the fluctuating trend of ROA in the pre and post digitalisation of bank but the rate of fluctuation is more observed in the pre digitalisation of era i.e., 2013 to 2017 than post digitalisation era i.e., 2018 to 2022.

**Chart No.4 : Comparative Return on Asset Ratio (ROA) in the Pre and Post Digitalisation of the Selected Public and Private Banks**



*Graphical Representation of the Table No.4*

The Return on Asset ratio (ROA) of the selected Public and Private Sector Bank has been represented by the bars in the pre and post digitalisation of bank in the Chart No.4. The pink coloured bar illustrated the pre digitalisation of efficiency ratio in contrast with green coloured bar represented the post digitalisation Return on Asset (ROA). The above chart clearly depicts that the digitalisation has been made the positively ROA of Public sector bank but in case of private sector bank, digitalisation doesn't improve the Return on Asset. This may be resulted due to the inclusion of e-channel portfolio diversification of asset, leveraged out non-performing assets through the usage of digital channels and optimum utilisation of digital platform for diversification and expansion of business.

**Table No.5 : Comparative Analysis of the Efficiency Ratio in the Pre and Post Digitalisation of Selected Bank**

(in %)

	Pre-Digitalisation of banks					Post digitalisation of banks				
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>PUBLIC SECTOR BANK</b>										
SBI	48.51	52.67	49.04	49.14	47.75	50.18	55.70	52.46	53.60	57.91
Canara Bank	46.61	47.22	51.10	51.18	48.85	50.03	49.69	55.30	49.40	46.16
PNB	42.81	45.06	46.74	44.94	39.17	56.75	47.03	44.82	46.68	49.38
BOB	44.70	51.24	51.34	52.76	46.42	47.26	48.80	45.02	46.54	45.74
UBI	39.79	43.44	43.63	50.30	45.86	45.87	45.56	47.86	49.90	49.24
AVG	44.48	47.93	48.37	49.67	45.61	50.02	49.36	49.09	49.22	49.68
	<b>Pre Digitalisation Efficiency Ratio=47.31</b>					<b>Post Digitalisation Efficiency Ratio=49.47</b>				
<b>PRIVATE SECTOR BANK</b>										
ICICI BANK	40.58	38.32	36.83	34.70	35.78	38.83	43.56	43.48	37.20	40.52
AXIS BANK	42.63	40.82	40.74	38.55	40.96	47.29	45.45	42.47	41.69	48.83
HDFC Bank	49.14	45.61	44.56	44.28	43.37	41.02	39.65	38.64	36.32	36.88
Kotak Mahindra Bank	50.61	49.66	52.06	57.52	48.42	47.30	47.37	46.90	41.27	47.99
IndusInd Bank	48.84	45.71	46.79	47.00	46.74	59.51	29.78	60.82	56.88	55.20
AVG	<b>46.36</b>	<b>44.02</b>	<b>44.20</b>	<b>44.41</b>	<b>43.05</b>	<b>50.86</b>	<b>46.79</b>	<b>46.46</b>	<b>42.67</b>	<b>45.88</b>
	<b>Pre Digitalisation Efficiency Ratio=43.80</b>					<b>Post Digitalisation Efficiency Ratio=46.53</b>				

Source: Computed by the author from the Annual Report of the Selected Bank.

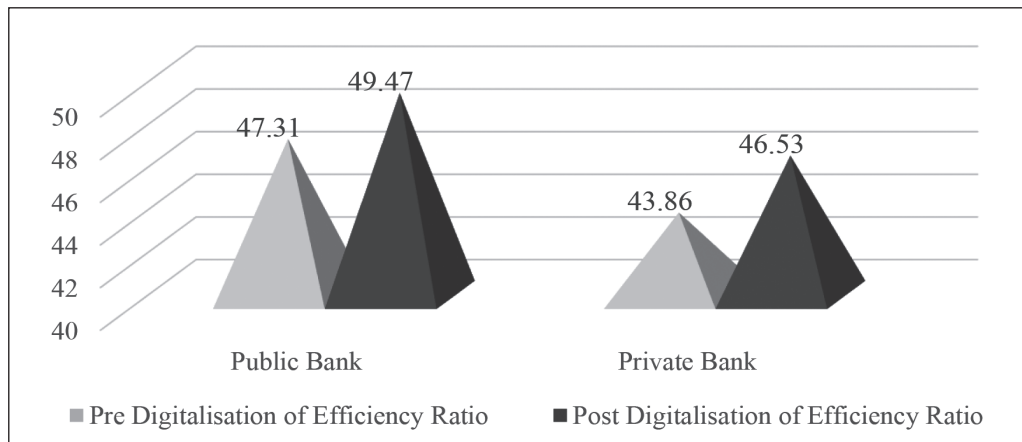
The bank efficiency ratio is a key performance metric used to assess a bank's profitability. It is calculated by dividing a bank's operating expenses by its total income and is therefore also referred to as a bank's "Cost to Income Ratio". This metric is important as it provides a guide as to how efficiently a bank is managing its cost base; thereby providing a gauge as to the proportion of operating expenses incurred for each dollar of income generated. The lower the efficiency ratio, the more efficiently the bank operates.



The above table exhibits the comparative analysis of the efficiency ratio in the pre and post digitalization of the selected bank. In the case of selected public sector bank, the SBI, Canara bank, PNB and UBI has illustrated the higher efficiency ratio in the post digitalisation of its product and services than pre digitalisation of bank which discloses that the bank has to incurred additional expenditure to earn the revenue in the era of post digitalisation of bank. On the other hand, the BOB has reported the higher efficiency ratio of bank in the pre digitalization of bank that depicts that the digitalisation has improve the performance of bank as lower ratio is preferable.

In the case of private sector bank, the ICICI bank, AXIS Bank and IndusInd Bank has illustrated that the digitalisation has made impacted negatively on the performance of bank. . This may be resulted due to the adoption of technology in the working environment pose a major challenge which led to the efficiency ratio of bank recorded at much lower level than expected. But in case of Kotak Mahindra bank and HDFC Bank it has been figured out that digitalisation has made positively impacted on the financial performance as the efficiency rate has been lowered after adoption of digitalisation.

**Chart No.5 : Comparative Analysis of Efficiency Ratio in the Pre and Post Digitalisation of the Selected Public and Private Banks**



*Graphical Representation of the Table No.5*

The Efficiency Ratio of the selected Public and Private Sector Bank has been represented by the pyramid in the pre and post digitalisation of bank in the Chart No.5. The yellow pyramid represents the pre digitalisation of efficiency

ratio in contrast with purple pyramid represent post digitalisation of efficiency ratio. It is evident from the chart that the in the case of public sector bank, digitalisation has been severally impacted the efficiency of operating the business of bank but in relation to Private Sector Bank, digitalisation has enhanced the efficiency of operating the business of bank. Thus, it is concluded that digitalisation has impacted differently to the public and private sector bank that may be resulted due to additional infrastructure cost of implementing digital channel, providing huge cost on training and motivating employees and strengthening the digital innovative product and services.

### Testing of Hypothesis

$H_{01}$  : There is no significant difference in the impact of pre and post digitalisation on the financial performance of the Public Sector Banks.

**Table No.6 : Paired Sample t-test in the Pre and Post Digitalisation of Public Sector Bank**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-Digitalisation –post-Digitalisation	10.14800	23.03250	10.30045	-18.45063	38.74663	.985	4	.380

Computed by the author in the SPSS20

Table- 6 represents the paired t-test of the comparative pre and post digitalisation of the selected Public Sector Bank. The paired t-test was used to see if there was a significant difference in the pre and post digitalisation of the selected Public Sector Bank. The two-tail p-value is found to be  $p = 0.380$ , and the two-tail  $t = 0.985$ . It indicates that there is no considerable disparity found in the pre and post digitalisation of the selected Public Sector Bank since the set alpha value is 0.05 and the p-value is more than 0.05 which reveals that the difference is non-statistically significant. Therefore, null hypothesis is accepted and alternative hypothesis is rejected.

**H<sub>02</sub>** : There is no significant difference in the impact of pre and post digitalisation on the financial performance of the Public Sector Banks.

**Table No.7 : Paired Sample t-test in the Pre and Post Digitalisation of Private Sector Bank**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-Digitalisation–post-Digitalisation	-1.63400	1.76496	.78931	-3.82549	.55749	-2.070	4	.107

Computed by the author in the SPSS20

Table- 6 represents the paired t-test of the comparative pre and post digitalisation of the selected Private Sector Bank. The paired t-test was used to see if there was a significant difference in the pre and post digitalisation of the selected Private Sector Bank. The two-tail p-value is found to be  $p = 0.107$ , and the two-tail  $t = -2.070$ . It indicates that there is no considerable disparity found in the pre and post digitalisation of the selected Private Sector Bank since the set alpha value is 0.05 and the p-value is more than 0.05 which reveals that the difference is non-statistically significant. Therefore, null hypothesis is accepted and alternative hypothesis is rejected.

Thus, it is found that digitalisation doesn't bring the considerable improvement in the financial performance of bank.

### **Finding of Study and Suggestions of Study**

**FINDINGS OF STUDY** - The detailed analysis of the study concluded with the following findings :

- **Net Worth Protection Ratio (NWPR)** : The average of NWPR in the pre and post digitalization of Public Sector Bank is 3.67% and 2.60% whereas the NWPR in the pre and post digitalisation of the Selected Private Sector Bank is 10.57% and 10.86%. Thus, it is concluded that digitalisation has negatively influence the financial performance of public sector bank whereas digitalisation has positively (small proportionate improvement) influenced the financial performance of private sector bank. The digitalisation doesn't

bring the significant improvement in the financial performance of bank, which may be resulted due to the inefficient system of e-handling mechanism of bad assets i.e., NPA, high cost of the support of digital infrastructure set-up and danger of cyberattack due to the inclusion of technology in banking sector.

- Profit Per Employee :** The mean of PPE in the pre and post digitalization of Public Sector Bank is recorded at 4.33% and -46.96% on the other hand mean of PPE in the pre and post digitalization of Private Sector Bank is reported at 11.91% and 13.20%. Thus, it is found out that in the case of Public Sector Banks, digitalisation has made negatively influence its financial performance in contrast with Private Sector banks, the digitalisation has paved the way for improving its performance in relation to PPE but such proportion of the improvement is very small amount. The result of study states that there is no significant changes has been observed in the pre and post digitalization of selected bank that may be resulted due to continuous resistance of employees in relation to adoption of technological sphere in the working environment, inefficiency to operate the business (digital products and services) through digital channels and insufficiency of training and counselling programmes that urge the satisfaction of employees.
- Liquid Assets to Total Assets Ratio (LATTA) :** The average of Liquid Asset to Total Asset Ratio in the pre and post digitalisation of Public Sector Bank is recorded at 10.34% and 9.70% and on the other hand the Private Sector Bank recorded the of Liquid Asset to Total Asset Ratio in the pre and post digitalisation is 7.72% and 11.79%. It has been observed that in the case of public sector bank, the liquidity of the banks has been fallen in the post digitalisation of bank which may be resulted due to heavy expenditure on the training and counselling programmes, over-expenditure on the implementation of digital platform, incurred heavy outlet on the advertisement. On the other hand, it is also observed that liquidity of selected Private Sector Banks has been improved in post digitalisation of banks which may be resulted due to information symmetries, providing a user-friendly consumer interface and a higher standard of service.
- Return on Asset (ROA) :** The average of ROA in the pre and post digitalisation of public sector bank at 3.15% and 3.25% in contrast with private sector banks has been recorded the ROA in pre and post digitalization at 5.19% and 4.98%. Thus, it is concluded that in the case of Public Sector Banks, digitalization bring the substantial improvement on

the financial performance of banks and on the other hand, digitalisation doesn't bring any fruitful result in the case of private sector banks. The result of study doesn't find any significant changes in pre and post digitalization of the selected banks which may be resulted due to the inefficiency of digital channels in relation to monitoring of NPA, unsatisfactorily e -customer support services due to limited availability of infrastructure in comparison to the global banking industry and higher chances of cyber-attack that prevent the proportionate number of customers are still rely traditional banking system.

- **Efficiency Ratio :** The average of Efficiency Ratio in the pre and post digitalisation of public sector bank is 47.31% and 49.47% in contrast with private sector banks has been recorded the Efficiency Ratio in pre and post digitalization is 43.80% and 46.53%. Thus, it is concluded that digitalization doesn't bring the significant improvement on the financial performance of bank as the result of paired t test previously reveals in Table No.6 which may be resulted due to the changes of the working pattern of employees, opening the door of global business of banking industry through inclusion of diversified portfolio of product which create the tough competition between Indian and global banking industry, increasing cost of digital transformation.

Thus, on the basis of above detailed discussion it has been figured out that a myth prevails in the economy that digitalisation has bring the improvement on the financial performance of selected bank and witnessed that no such statistical relationship has been found in the study. But it is not to be neglected that digitalisation brings many benefit – improving working pattern of employees, user-friendly experience, increased customer base, data driven decisions, service resolution quality and timely resolving the grievances of customers. Apart, from the number of benefits, digitalisation still doesn't pave the way for improving the performance of the banking sector. The main reason behind such insignificant impact of digitalisation is the economical disturbance has been created through the introduction of demonetisation & digitalisation that signalling the instability of Indian economy as the govt consider necessary to bring the digitalisation and demonetisation with the motive to control misappropriation of public funds, cross border funding and black marketing. .However, such efforts are futile as the people of India still relies on the traditional channel of banking product and services due to the fear of cyberattacks, leakage of sensitive information and lack of human control. Another major reason behind such ineffective impact of digitalisation is the absence of the adoption of technological support and

insufficiency of financial funds which acts as a block for the effectively implementation of digitalization. Thus, these above mentioned factors contributes to the proportionately same financial performance in the pre and post digitalization of the selected public and private sector bank.

Thus, on the basis of findings, the following suggestions has been formulated to deliver the more significant and positively impact of digitalisation on the financial performance of Indian banking industry in the coming years:

### **Suggestions of the Study**

1. The government needs to encourage banks to devote their CSR (Corporate Social Reporting) budgets for resolving issues with online banking in relation to fund allocation challenges faced by the banks.
2. To boost staff productivity, banks must integrate cutting-edge technology from overseas and provide ongoing training to employees so that they can easily adjust to changes and improve the productivity of employees.
3. Banks should devise techniques to minimise the number of branches per client (closing down redundancy branches) in order to lower their operating costs and thereby increase investment of technological upgradation that resulted improve the financial performance of banks.
4. It should be required of telecommunications providers to offer high-speed internet in rural regions so the benefit of digitalisation is reachable to every person.
5. The RBI should develop the strong model which protects from the cyberattacks and thereby reducing the leakage rate of sensitive information.

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# **India Achieving 5 Trillion US Dollar Economy – Dream or Possibility**

MAHENDRA NATH PANDEY AND CHITRANJAN OJHA

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**Abstract :** xxxxxxxxxxxxxxxx

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**Keywords :** Mergers, Acquisitions, Pharmaceutical Industry.

## **Introduction:**

Prime Minister Narendra Modi in 2019 envisioned making India a US 5 trillion Dollar **economy** and a global economic powerhouse by 2024-25. With this, India would become the third largest economy in the world. It is estimated that the Indian economy is to grow at 9.2 per cent during the current fiscal (2022-23) while 8-8.5 per cent for the next financial year. India poised to achieve \$5 trillion economy dream through 'Atmanirbhar Bharat' India Bharat' strategy. The government of India is endeavoring to realize the country's manufacturing potential through flagship programmes like Make in India, and the Production Linked Incentive (PLI) schemes. Besides, the government is also emphasizing on capital spending to support the economy and in the Covid pandemic's aftermath economy. These measures are supposed to boost the manufacturing

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sector. Also, the macro-economic trends of 'China Plus One', that refers to businesses reducing their dependence on China for production, presents a significant opportunity for India to become a businesses a production hub.

Over the next few years, India's rate of economic growth is expected to surpass those of other comparable economies despite the current head winds. Many observers, including foreign brokerage firms and international organisations perceive India as having enormous economic potential. With an Atmanirbhar Bharat agenda, the country can convert the crises of inflation and a feared recession into an opportunity.

Chief Economic Adviser (CEA) V. Anantha Nageswaran on June 14, 2022 said "We are now \$3.3 trillion, it is not such a difficult target to reach. Then if you simply assume 10% nominal GDP growth in dollar terms, then you get to \$10 trillion by 2033-34 and another doubling with the same rate,".

Addressing an event organised by UNDP India, CEA V Anantha Nageswaran said, "We are now \$3.3 trillion, it is not such a difficult target to reach. Then if you simply assume 10 per cent nominal GDP growth in dollar terms, then you get to \$10 trillion by 2033-34 and another doubling with the same rate," . Chief Economic Adviser (CEA) **V Anantha Nageswaran** on have opined that India would become a \$5 trillion economy by 2026-27 and USD 10 trillion by 2033-34. Addressing an event organised by **UNDP India**, Nageswaran said India is relatively better placed than other emerging economies. "On the face of it, looks optimistic, even ambitious, but if we get to \$5 trillion by 2026-27. Among others, India has also experienced an economic boom since the implementation of economic liberalisation in the early 1990s. The first list includes estimates compiled by the International Monetary Fund's World Economic Outlook, the second list shows the World Bank's data, and the third list includes data compiled by the United Nations Statistics Division. The IMF definitive data for the past year and estimates for the current year are published twice a year in April and October. Non-sovereign entities (the world, continents, and some dependent territories) and states with limited international recognition (such as Kosovo and Taiwan) are included in the list where they appear in the sources.

Nominal gross domestic product stood at \$2.83 trillion in FY20, so the country needed to grow by nearly 100% in the dollar term in the next five years.

Doubling the size of the Indian economy has happened in the past in less than five years as well. In fact, this happened in four years– between FY04 and FY08– when India emerged as a \$1-trillion economy for the first time. So, another doubling of the size in five years initially did not seem to be impossible.

**Importance of the Study:**

Economic Development refers to the expansion of economic activities in the country, which in turn result in increased per capita income, more goods and services and better quality of life to the people. As stated above the country currently stood at about 3 trillion US dollar GDP. If it achieves the target of having 5 trillion US dollar economy, it means the per capita income of the people will increase substantially, and quality of life of people would be better as of now. The present study has been undertaken to find that “whether the target of economic growth as envisaged by the Prime Minister can be achieved or whether the target is mere a political plank”.

**Objectives of the Study:**

The present study has been with the following objectives:

1. To see the viability of the dream of the Prime Minister.
2. To find whether the Indian economy is poised to undertake the task.
3. To see how the Indian Economy is preparing to achieve the task.
4. To find out the various challenges in achieving the target.

**Hypothesis of the Study:**

The study has been undertaken with the sole hypothesis “ India has enough economic strength for expansion of economic activities and the target of 5 trillion US Dollar GDP is achievable.”

**Limitations of the Study:**

The study is based on the secondary data collected through various sources including print and electronic media and also on various experts’ opinion. Future Projections are based on economic experts views expressed on different times. With change in economic atmosphere in the country and also globally alters the earlier expectations.

**Indian Economy:**

The important indicators of the Indian Economy has been presented in Table No.1 below.

**Table-1 : Showing Important Indicators of Indian Economy in August 2022**

<b>Population</b>	1,389,637,446 (2nd; 2022 estimate.)
<b>GDP</b>	\$3.535 trillion (nominal; 2022 est.)\$11.745 trillion (PPP; 2022 est.)
<b>GDP rank</b>	5th (nominal; 2022)3rd (PPP; 2022)
<b>GDP growth</b>	–6.6% (2020)8.7% (2021e)7.5% (2022f)7.1% (2023f)
<b>GDP per capita</b>	\$2,543 (nominal; 2022 est.)\$8,358 (PPP; 2022 est.)
<b>GDP per capita rank</b>	142nd (nominal; 2022, 128th (PPP; 2022)
<b>GDP by sector</b>	Agriculture: 16.38%Industry: 29.34%Services: 54.27% (FY 2020-21)
<b>Inflation (CPI)</b>	6.71% (July 2022)
<b>Population below poverty line</b>	6% in extreme poverty (2022 est.)
<b>Labour force</b>	471,295,273 (2021)48.7% employment rate (2020)
<b>Unemployment</b>	6.80% (July 2022)
<b>Main Industries</b>	Textiles, chemicals ,food processing, agribusiness, handicrafts, petroleum, petrochemicals gems and Jewellery, leather, iron ore, steel, aluminium, cement, mining, metals, retail, machinery, information technology, aerospace, construction, financial services, electric power, consumer goods, pharmaceuticals, automotive, telecommunications, real estate, paper, transportation equipment
<b>Ease-of-doing-business rank</b>	63rd (easy, 2020)
<b>Exports</b>	\$421.894 billion (FY2021-22)
<b>Export goods</b>	Manufacturers 70.8%, Fuels and mining products 17.3%, Agricultural products 11.5%, Others 0.4%[27] (2019)
<b>Main export partners</b>	United States 16.89% United Arab Emirates 6.77% China 3.45% Bangladesh 3.38% Netherlands 3.37% Other 66.14% (FY 2021-22)

**Data Source :** CIA World Fact Book All values, unless otherwise stated, are in US dollars. (<https://www.cia.gov/the-world-factbook/countries/india>)

## **History of Economic Growth in India:**

### **Ancient and medieval eras:**

**Indus Valley Civilisation :** The Indus Valley civilization flourished between 2800 BC and 1800 BC, practiced agriculture, domesticated animals, used uniform weights and measures, made tools and weapons, and traded with other cities. Evidence of well-planned streets, a drainage system, and water supply reveals their knowledge of urban planning, which included the first-known urban sanitation systems and the existence of a form of municipal government. **West Coast** Maritime trade was carried out extensively between South India and Southeast and West Asia from early times until around the fourteenth century AD. Both the Malabar and Coromandel Coasts were the sites of important trading centres from as early as the first century BC, used for import and export as well as transit points between the Mediterranean region and southeast Asia. **Silk Route Scholars** suggest trading from India to West Asia and Eastern Europe was active between the 14th and 18th centuries.

### **Mughal era/Rajput era/Maratha era (1526–1820)**

The Indian economy was large and prosperous under the Mughal Empire, up until the 18th century. Sean Harkin estimates China and India may have accounted for 60 to 70 percent of world GDP in the 17th century. The Mughal economy functioned on an elaborate system of coined currency, land revenue and trade. Gold, silver and copper coins were issued by the royal mints which functioned on the basis of free coinage. The Mughal Empire had a thriving industrial manufacturing economy, with India producing about 25% of the world's industrial output up until 1750, making it the most important manufacturing center in international trade. Manufactured goods and cash crops from the Mughal Empire were sold throughout the world.

### **British era (1793–1947)**

From the beginning of the 19th century, the British East India Company's gradual expansion and consolidation of power brought a major change in taxation and agricultural policies, which tended to promote commercialization of agriculture with a focus on trade, resulting in decreased production of food crops, mass impoverishment and destitution of farmers, and in the short term, led to numerous famines. The economic policies of the British Raj caused a severe decline in the handicrafts and handloom sectors, due to reduced demand and dipping employment. After the removal of international restrictions by the Charter of 1813, Indian trade expanded substantially with steady growth. The

result was a significant transfer of capital from India to England, which, due to the colonial policies of the British, led to a massive drain of revenue rather than any systematic effort at modernisation of the domestic economy. Under British rule, India's share of the world economy declined from 24.4% in 1700 down to 4.2% in 1950. India's GDP (PPP) per capita was stagnant during the Mughal Empire and began to decline prior to the onset of British rule. India's share of global industrial output declined from 25% in 1750 down to 2% in 1900. At the same time, United Kingdom's share of the world economy rose from 2.9% in 1700 up to 9% in 1870. The British East India Company, following their conquest of Bengal in 1757, had forced open the large Indian market to British goods, which could be sold in India without tariffs or duties, compared to local Indian producers who were heavily taxed, while in Britain protectionist policies such as bans and high tariffs were implemented to restrict Indian textiles from being sold there. Whereas, raw cotton was imported from India without tariffs to British factories which manufactured textiles from Indian cotton and sold them back to the Indian market.

### **Pre-liberalisation period (1947–1991)**

Indian economic policy after independence was influenced by the colonial experience, which was seen as exploitative by Indian leaders exposed to British social democracy and the planned economy of the Soviet Union. Domestic policy tended towards protectionism, with a strong emphasis on import substitution, industrialisation, economic interventionism, a large government-run public sector, business regulation, and central planning, while trade and foreign investment policies were relatively liberal. Five-Year Plans of India resembled central planning in the Soviet Union. Steel, mining, machine tools, telecommunications, insurance, and power plants, among other industries, were effectively nationalised in the mid-1950s. The Indian economy of this period is characterised as Dirigism.

### **Post-liberalisation period (since 1991)**

Economic liberalisation in India was initiated in 1991 by Prime Minister P. V. Narasimha Rao and his then-Finance Minister Dr. Manmohan Singh. The collapse of the Soviet Union, which was India's major trading partner, and the Gulf War, which caused a spike in oil prices, resulted in a major balance-of-payments crisis for India, which found itself facing the prospect of defaulting on its loans. India asked for a \$1.8 billion bailout loan from the International Monetary Fund (IMF), which in return demanded de-regulation. In response, the Narasimha Rao government, including Finance Minister Manmohan Singh, initiated economic

reforms in 1991. The reforms did away with the License Raj, reduced tariffs and interest rates and ended many public monopolies, allowing automatic approval of foreign direct investment in many sectors. Since then, the overall thrust of liberalisation has remained the same, although no government has tried to take on powerful lobbies such as trade unions and farmers, on contentious issues such as reforming labour laws and reducing agricultural subsidies. By the turn of the 21st century, India had progressed towards a free-market economy, with a substantial reduction in state control of the economy and increased financial liberalisation. This has been accompanied by increases in life expectancy, literacy rates, and food security, although urban residents have benefited more than rural residents. From 2010, India has risen from ninth-largest to the fifth-largest economies in the world by nominal GDP in 2019 by surpassing UK, France, Italy and Brazil.

### **GDP grows exponentially, almost doubling every five years :**

Indian GDP growth rate from 1985 to 2016 in red, compared to that of China in green. India started recovery in 2013–14 when the GDP growth rate accelerated to 6.4% from the previous year's 5.5%. The acceleration continued through 2014–15 and 2015–16 with growth rates of 7.5% and 8.0% respectively. For the first time since 1990, India grew faster than China which registered 6.9% growth in 2015. However the growth rate subsequently decelerated, to 7.1% and 6.6% in 2016–17 and 2017–18 respectively, partly because of the disruptive effects of 2016 Indian banknote demonetization and the Goods and Services Tax (India). India is ranked 63rd out of 190 countries in the World Bank's 2020 ease of doing business index, up 14 points from the last year's 100 and up 37 points in just two years. In terms of dealing with construction permits and enforcing contracts, it is ranked among the 10 worst in the world, while it has a relatively favourable ranking when it comes to protecting minority investors or getting credit. The strong efforts taken by the Department of Industrial Policy and Promotion (DIPP) to boost ease of doing business rankings at the state level is said to impact the overall rankings of India.

### **COVID-19 pandemic and aftermath (2020–present) :**

During the COVID-19 pandemic, numerous rating agencies downgraded India's GDP predictions for FY21 to negative figures, signaling a recession in India, the most severe since 1979. According to a Dun & Bradstreet report, the country is likely to suffer a recession in the third quarter of FY2020 as a result of the over 2-month long nation-wide lockdown imposed to curb the spread of COVID-19.

## **The Covid Blues :**

But the unprecedented Covid outbreak in early 2020 changed everything. The government was forced to impose a pan-India lockdown; factories and other establishments remained shut so that the Covid spread could be contained. Several rounds of relief measures were announced by the government to soften the blow to individuals as well as businesses.

Just when things started looking up again and economic activities gained some traction in the March quarter of FY21, backed by government support like guaranteed loans under the Emergency Credit Line Guarantee Scheme (ECLGS), a massive nationwide vaccination programme and several other measures, hit the second Covid wave. Several localized lockdowns hit factory output, while growth in private consumption remained below par, reflecting the challenges faced by both the supply and demand sides of the economy.

Hurdles Beyond Pandemic Cut to 2022, just when everyone thought the Omicron onslaught was behind us, the Russia-Ukraine conflict flared up in late February. Global supply chains witnessed massive disruptions and commodity prices, especially of energy, spiked, exacerbating inflationary pressure. Advanced economies witnessed even higher price pressure (US inflation scaled afresh 40-year peak in May). This led key central banks, including the US Federal Reserve, to raise interest rates substantially to break the back of inflation. Consequently, key economies like the US and those in Europe are now staring at recession, which will weigh down global demand and hurt the prospects of the Indian economy as well, thanks to the integration in a globalized world. The Reserve Bank of India, too, has raised the benchmark lending rate twice since May by a total of 90 basis points, in a difficult trade-off with growth; it is widely expected to go for another hike in August. Independent agencies have already revised down their growth projections for several key countries, including India, although the country will still remain the world's fastest-growing major economy.

Shift In Time-Frame Domestic policy-makers have, therefore, shifted the goal post of realizing the \$5-trillion target by two years to 2027. This will catapult India into the league of top four economies in the world. Already, India is close to achieving the fifth-largest economy tag. According to World Bank data, India lost out the fifth spot to the UK in FY22 by a mere \$13 billion.

## **Obstacles in achieving the target:**

The forecast for the global economy is becoming gloomier as observers are seeing a distinct possibility of recession in the near future. levels globally, triggering The triggering fears of a global recession.

The depressing indications have heightened the fears of a severe global recession. However, the Indian economy is poised to continue the resiliently on its growth path resiliently .

Through the Atmanirbhar strategy, the country is earnestly preparing to accomplish its goal of achieving a GDP of \$5 trillion in the next few years.

A rise in domestic demand and international investment are expected to be the primary growth drivers. The Indian government has A has extended invitations to several businesses to establish manufacturing facilities in India, which is bound to boost the country's economy extended economy and generate employment.

It would be interesting to see how the Indian economy faces the prospect of recession. Experts believe that India's dependence on oil It oil imports immunises them against recessionary fears. The impending recession would drive down commodity prices internationally, imports allowing the nation to weather economic storms. Nevertheless, experts anticipate a mild and short-term impact of the recessionary allowing recessionary trends on India's economy. trends

Moreover, India relies mostly on local spending. Hence, till domestic economic conditions stay favourable, it is unlikely that a recession, Moreover, in the US will have a materially detrimental effect on India's economy. In comparison with other developing market economies, India may experience a milder impact.

An obstacle in achieving target of 5Trillion US Dollar economy have come in the way in form of Russia-Ukraine War, which is likely to spread as a world war. The world is facing the negative impact of the war in global economy which is also likely to impact the Indian Economy, as well. Let us see how the government of India is able to immunize itself from the negative impact and make equidistance from the warring countries.

## Analysis and Interpretation of Data:

**Table-2 : Showing GDP of Major Nations in terms of '000 US Dollar**

Country	IMF		United Nations		World Bank	
	Estimate	Year	Estimate	Year	Estimate	Year
World	93,863,851	2021	87,461,674	2020	96,100,091	2021
United States	25,346,805	2022	20,893,746	2020	22,996,100	2021
China	19,911,593	[n 2]2022	14,722,801	[n 3]2020	17,734,063	2021
Japan	4,912,147	2022	5,057,759	2020	4,937,422	2021



Germany	4,256,540	2022	3,846,414	2020	4,223,116	2021
India	3,534,743	2022	2,664,749	2020	3,173,398	2021
United Kingdom	3,376,003	2022	2,764,198	2020	3,186,860	2021
France	2,936,702	2022	2,630,318	2020	2,937,473	2021
Canada	2,221,218	2022	1,644,037	2020	1,990,762	2021
Italy	2,058,330	2022	1,888,709	2020	2,099,880	2021
Brazil	1,833,274	2022	1,444,733	2020	1,608,981	2021
Russia	1,829,050	2022	1,483,498	2020	1,775,800	2021
South Korea	1,804,680	2022	1,637,896	2020	1,798,534	2021
Australia		2022			1,542,660	2021

**Source :** International Monetary Fund's World Economic Outlook, the second list shows the World Bank's data, and the third list includes data compiled by the United Nations Statistics Division.

The table as presented above shows the economic position of India and other major economies of the world. It is evident from the above data that as of now Indian economy stands 5<sup>th</sup> in the world with 3.5 trillion US Dollar GDP. Although the estimates of IMF, The World Bank and United Nations Vary to some extent, but it represents almost the same position.

**Table-3 : Showing GDP and Growth Rate of India Year Wise**

Year	GDP (Bil.US\$PPP)	GDP Growth (Real)	Unemployment (Percent)	Government debt (% of GDP)
1980	372.3	5.3%	n/a	n/a
1981	432.0	6.0%	n/a	n/a
1982	474.6	3.5%	n/a	n/a
1983	529.1	7.3%	n/a	n/a
1984	569.2	3.8%	n/a	n/a
1985	618.0	5.3%	n/a	n/a
1986	660.6	4.8%	n/a	n/a
1987	703.8	4.0%	n/a	n/a
1988	798.8	9.6%	n/a	n/a
1989	879.4	5.9%	n/a	n/a

1990	962.8	5.5%	n/a	n/a
1991	1,005.9	1.1%	5.6%	75.3%
1992	1,085.3	5.5%	5.7%	77.4%
1993	1,163.7	4.8%	5.7%	77.0%
1994	1,267.7	6.7%	5.7%	73.5%
1995	1,392.4	7.6%	5.8%	69.7%
1996	1,524.9	7.6%	5.7%	66.0%
1997	1,614.0	4.1%	5.6%	67.8%
1998	1,733.1	6.2%	5.7%	68.1%
1999	1,906.9	8.5%	5.7%	70.0%
2000	2,027.1	4.0%	5.6%	73.6%
2001	2,173.9	4.9%	5.6%	78.7%
2002	2,294.6	3.9%	5.5%	82.9%
2003	2,522.9	7.9%	5.6%	84.2%
2004	2,794.2	7.8%	5.6%	83.3%
2005	3,148.7	9.3%	5.6%	80.9%
2006	3,544.5	9.3%	5.6%	77.1%
2007	3,996.5	9.8%	5.6%	74.0%
2008	4,232.7	3.9%	5.4%	72.7%
2009	4,626.7	8.5%	5.5%	71.1%
2010	5,160.8	10.3%	5.5%	66.0%
2011	5,618.4	6.6%	5.4%	68.3%
2012	6,153.2	5.5%	5.4%	67.7%
2013	6,477.5	6.4%	5.4%	67.4%
2014	6,781.0	7.4%	5.4%	66.8%
2015	7,159.8	8.0%	5.4%	68.8%
2016	7,735.0	8.3%	5.4%	68.7%
2017	8,276.9	6.8%	5.4%	69.5%
2018	9,021.6	6.5%	5.3%	70.2%

**Source :** Compiled from economic indicators in 1980–2027 (with IMF staff estimates in 2022–2027), The annual unemployment rate is extracted from the World Bank. Economy of India - Wikipedia [https://en.wikipedia.org/wiki/Economy\\_of\\_India](https://en.wikipedia.org/wiki/Economy_of_India).

The data as shown above in table No 3 above shows the growth rate of Indian economy together with its unemployment rates and govt. debt as percentage of GDP. It is evident from thr data that the Indian Economy is growing on the average at 7-9 percent per year. The unemployment rate and Govt. debts stands almost constant. Although the Population of the country is growing fast, the constant unemployment rate is showing the expansion of economic activities in the country. The constant Govt. debt rate is also showing the favourable strength of the economy.

**Table-4 : Showing Projected expansion of Indian Economy**

FY	At 7%	At 8%	At 9%	At 10%
21-22	3.5	3.5	3.5	3.5
22-23	3.745	3.78	3.8	3.85
23-24	4.0	4.08	4.15	4.23
24-25	4.29	4.4	4.53	4.65
25-26	4.6	4.76	4.94	5.12
26-27	4.9	5.14	5.38	5.63
27-28	5.35	5.56	5.96	6.19

Table No 4 presented as above shows the projected position of the Indian economy over the years at various growth rates. Since the average growth rate of Indian economy varies from 7 to 9 percent, projections have been made at the rates. Besides the Government claims that the economy will grow at 10 percent in coming years due to its strong fundamentals, computations have also been made at 10 percent to know the position of the Indian economy in years to come. As the table No 4 shows, if the country grows at 7 percent the country will achieve the target by Fyn 26-27. If it grows at 8 percent the target is expected to be achieved by FY 26-27. If it grows at 9 percent the country will achieve the target of 5 trillion Dollar Economy by FY 25-26, and if it grows at 10 percent (as expected by the Government) the target of 5 trillion US Dollar economy is expected to be achieved by FY 25-26. Hence as per the projections, it is expected that the country will be 5 trillion Dollar economy earliest by FY 25-26 or lately by FY 26-27.

## **Test of Hypothesis :**

On the basis of the above facts and deliberation the hypothesis that hypothesis “India has enough economic strength for expansion of economic activities and the target of 5 trillion US Dollar GDP is achievable.” has been accepted.

## **Summary of Conclusions and Suggestions:**

### **Conclusion:**

Prime Minister Narendra Modi in 2019 envisioned making India a US **5 trillion Dollar economy** and a global economic powerhouse by 2024-25. India poised to achieve \$5 trillion economy dream through ‘Atmanirbhar Bharat’ India Bharat’ strategy. Chief Economic Adviser (CEA) V. Anantha Nageswaran also viewed that the country would achieve the dream by FY 24-25.

The present study has been undertaken to find that “whether the target of economic growth as envisaged by the Prime Minister can be achieved or whether the target is mere a political plank”.

The Indus Valley civilization flourished between 2800 BC and 1800 BC, practiced agriculture, domesticated animals, used uniform weights and measures, made tools and weapons, and traded with other cities. Evidence of well-planned streets, a drainage system, and water supply reveals their knowledge of urban planning, which included the first-known urban sanitation systems and the existence of a form of municipal government. The Indian economy was large and prosperous under the Mughal Empire, up until the 18th century. From the beginning of the 19th century, the British East India Company’s gradual expansion and consolidation of power brought a major change in taxation and agricultural policies, which tended to promote commercialization of agriculture with a focus on trade, resulting in decreased production of food crops, mass impoverishment and destitution of farmers. The economic policies of the British Raj caused a severe decline in the handicrafts and handloom sectors, due to reduced demand and dipping employment. Under British rule, India’s share of the world economy declined from 24.4% in 1700 to 4.2% in 1950. Indian economic policy after independence was influenced by the colonial experience, which was seen as exploitative by Indian leaders exposed to British social democracy and the planned economy of the Soviet Union. Domestic policy. Five-Year Plans of India resembled central planning in the Soviet Union. The Indian economy of this period is characterised as Dirigisme.

liberalization in India was initiated in 1991 by Prime Minister P. V. Narasimha Rao and his then-Finance Minister Dr. Manmohan Singh. Indian GDP growth rate from 1985 to 2016 was considered in red, compared to that of China in green. India started recovery in 2013–14 when the GDP growth rate accelerated to 6.4% from the previous year's 5.5%. The acceleration continued through 2014–15 and 2015–16 with growth rates of 7.5% and 8.0% respectively. During the COVID-19 pandemic, numerous rating agencies downgraded India's GDP predictions for FY 21 to negative figures, signaling a recession in India, of India and other major economies of the world. It is evident from the above data that as of now Indian economy stands 5<sup>th</sup> in the world with 3.5 trillion US Dollar GDP. Average growth rate of Indian economy varies from 7 to 9 percent, projections have been made at the rates. Besides, the Government claims that the economy will grow at 10 percent in coming years due to its strong fundamentals. As the table No 4 shows, if the country grows at 7 percent the country will achieve the target by FY 26-27. If it grows at 8 percent the target is expected to be achieved by FY 26-27. If it grows at 9 percent the country will achieve the target of 5 trillion Dollar Economy by FY 25-26, and if it grows at 10 percent (as expected by the Government) the target of 5 trillion US Dollar economy is expected to be achieved by FY 25-26. Hence as per the projections, it is expected that the country will be 5 trillion Dollar economy earliest by FY 25-26 or lately by FY 26-27.

### **Suggestions:**

Although the fundamentals of Indian economy are favourable for achieving the target of 5 trillion US Dollar economy but there are hurdles also in the path. The following suggestions are humbly made for making Indian economy to 5 US trillion Dollar GDP mark. —

1. It has been noticed that there is growing trend in Political Parties to offer freebies which adversely affect the economic growth, should be restricted.
2. Education and Research are important for growth and development, these sectors should be given priority over other sectors.
3. Growth in Agriculture sector is necessary for self-reliance and sustainability, this should be given adequate importance in planning.
4. Infra-structure development is basic for growth, its importance in planning should be maintained.
5. Adequate capital investment should be made in Space sector and its development.
6. Self-reliance of defense production should be accelerated.

7. Reforms in labour Laws seems necessary to make it more productive and responsible.

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# Assessing Factors Influencing E-Entrepreneurship Intentions Among Aspiring Women Entrepreneurs

ANUPRIYA PANDEY AND VARSHA JAISWAL

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**Abstract :** *The internet has facilitated the rise of e-entrepreneurship as a burgeoning form of entrepreneurship among various entrepreneurs. Women entrepreneurs, in particular, can leverage this medium to their benefit. The research examines women entrepreneurs' e-entrepreneurship intention. Moreover, the study seeks to identify the crucial factors including performance expectancy, effort expectancy, price value, habit, resource readiness, relational support, educational support, and structural support, on the intention to engage in e-entrepreneurship by utilising the UTAUT and ESM model. Additionally, the research explored the indirect impact of these factors through motivation. To achieve the objective, a pre-screened survey was administered to female students who are pursuing graduate programmes at Delhi University and have an interest in entrepreneurship. The findings are obtained from the application of structural equation modelling through Smart PLS (version 4). The findings have made a valuable contribution to the existing research lacuna concerning female entrepreneurship and digital entrepreneurship.*

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**Keywords :** Women Entrepreneurship, E-entrepreneurship Intention, UTAUT, Entrepreneurial Support Model (ESM).

## Introduction

The two dimensions of entrepreneurship, namely women entrepreneurship and e-entrepreneurship, have garnered considerable attention from both business practitioners and academics at the beginning of the 21st century. Since 2014, female entrepreneurial research has expanded to about 150 articles per year Deng et al. (2021). At the same time, "e-entrepreneurship", whose emergence has been facilitated by the advent of information and communication

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technologies such as the internet and other electronic platforms (Mivehchi, 2019) and which emphasises the virtualization (digitalization) of some or all business processes and activities that, in conventional organisations, were carried out physically (Jelonek, 2015), has also captured the interest of a large number of researchers (Qasim et al., 2020). Other terms such as internet entrepreneurship, cyber entrepreneurship, and digital entrepreneurship have also been used to refer to business models that take advantage of information and communication technologies (Quinones et al., 2015). Research on e-entrepreneurship intentions is necessary given the current popularity of internet-based businesses (Ghatak et al., 2020).

Entrepreneurs can gain a competitive edge, study, and participate in international commerce by using the internet (Mathew, 2010). The Internet lets women entrepreneurs determine their own hours and priorities (Chatterjee et al., 2020). In order to keep their enterprises afloat during the COVID-19 lockdown in India, many female entrepreneurs resorted to doing business online (Srinivasu et al., 2022). Although it has a lot of potential, the conversation about how women may grow their businesses by utilising digital technology is still in its infancy (Kelly and McAdam, 2022). The study of e-entrepreneurship warrants a separate examination of women entrepreneurs, reason being entrepreneurship is recognised as a gendered phenomenon, wherein women entrepreneurs are perceived differently from their male counterparts due to distinct motivations for initiating businesses and unique challenges encountered (Cho et al., 2020). Thus, our research seeks to connect women entrepreneurship and e-entrepreneurship and identify the factors that influence women entrepreneurs to pursue electronic business in this digital age. This study addresses the following research question:

RQ. What are the key individual, innovation, and environmental factors that influence women's e-entrepreneurial intention, or the inclination to become an e-entrepreneur?

The subsequent sections of this paper are organised as follows: A detailed literature review, theoretical framework, and hypotheses followed by methodology, data analysis, discussion, implications, conclusion, limitations, and future scope.

## **Literature Review**

E-entrepreneurship intention can be defined as "the intention to start a new business through means of internet, the intention to own an online business, or



the intention to be self-employed” (Batool et al., 2015, pp.2). Using UTAUT examine how female entrepreneurs, use mobile apps for continuity of their enterprises (Abed, 2021). Dutta and Shivani (2020) examined Jharkhand female entrepreneurs’ attitudes towards e-commerce. Alzamel et al. (2019) examine how resource availability influences Saudi Arabian undergraduate female students’ social support perceptions and their intention to start an enterprise. Mand et al. (2018) examine how unemployment and education affect women’s e-entrepreneurship in India.

The studies above examine the influence of specific factors, technologies, or supportive infrastructures but a comprehensive framework that incorporates all these factors has yet not found. Future research could examine entrepreneurial intention using a comprehensive framework that includes university-based entrepreneurship support, student characteristics, family dynamics, and social effects (Lu et al., 2021). Given the current situation, an attempt has been undertaken to identify a resolution to the issue, which will ultimately lead to an enhancement of the research domain.

## **Theoretical Framework**

Various theoretical frameworks as the theory of reasoned action (TRA) (Ajzen & Fishbein, 1975); the technology acceptance model (TAM) (Davis, 1989); the theory of planned behaviour (TPB) (Ajzen, 1991); and the unified theory of acceptance and use of technology model (UTAUT) (Venkatesh et al., 2003) have been employed to investigate the intention towards entrepreneurship, both in traditional and in the online domain. The framework of the research is based on two pre-existing models: The Unified Theory of Acceptance and Use of Technology 2 model (UTAUT 2) created by Venkatesh et al. (2012) and the Entrepreneurial Support Model (ESM) proposed by Turker and Selcuk (2009). Venkatesh et al. (2003) integrated eight well-established theories into the UTAUT model to better understand adoption behaviour in a technology setting. The UTAUT model’s major emphasis is on the attributes of innovation and individual traits in predicting behaviour, and its first use was in organisational contexts; UTAUT 2 (Venkatesh et al., 2012) broadened its scope to include consumer situations. Literature in the field of entrepreneurship research suggests that, in addition to the attributes mentioned in the UTAUT, environmental support factors such as support from educational institutions, society, and government play a significant role in promoting the intention to become an entrepreneur. (Ben Youssef et al., 2021; Lai & To, 2020). The Environmental Support Model (ESM) has been used to identify noteworthy environmental factors, such as

structural support, educational support, and relational support. The ESM factors are incorporated with the innovation and individual attributes specified in the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), thereby customising the model to suit the entrepreneurship context. The decision to pursue an entrepreneurial career trajectory is shaped by both environmental factors and cognitive-personal variables (Solesvik 2013). The UTAUT has been widely applied to existing innovations such as e-collaboration (Chan et al., 2012), Use Intelligent Conversational Agents in e-Commerce (Ikumoro & Jawad, 2019), ERP (Uddin et al., 2020) and Social media marketing (Chatterjee & Kumar Kar, 2020). Therefore, there is an opportunity to expand the application of the UTAUT to e-entrepreneurship intention.

Although there has been research conducted on the correlation mentioned above, there appears to be a limited number of studies that have considered the role of motivation as a mediator variable, as noted by Dana et al. (2021) and Hassan et al. (2021). Several empirical studies have indicated that contextual factors have an indirect impact on entrepreneurial intentions through individual psychological factors. For instance, Mahendra et al. (2017) found that the effect of entrepreneurship education on entrepreneurial intention is mediated by motivation. Thus, motivation is introduced as a mediating variable into the research framework. The moderating variables of age and gender have been excluded from our model due to the fact that our sample has been drawn from a homogenous group.

## **Hypotheses Development**

The research endeavours to investigate the mediating function of entrepreneurial motivations in the relatively unexplored correlation between e-entrepreneurship attributes and intention, as well as environmental support and intention. Consequently, a conceptual framework was formulated to investigate the aforementioned associations (depicted in Figure 1).

### ***UTAUT, Entrepreneurship Motivation and E-entrepreneurship Intention***

The three attributes of any innovation as defined under UTAUT are: performance expectancy (PE), effort expectancy (EE) and price value (PV). We modify these concepts and terminologies from UTAUT for the context of entrepreneurship. Performance expectancy is the extent to which female entrepreneurs believe that operating an online business would enhance their business performance (Zamzami, 2021). The ease with which women entrepreneurs conduct online business is known as their effort expectation (Venkatesh et al., 2003). Price

value is the cognitive trade-off made by female business owners between the perceived value of internet-based business apps and the associated costs (Venkatesh et al., 2012).

According to Özsungur (2019) , there was a positive correlation between performance expectancy and behaviour intention, whereas there was a negative correlation between effort expectancy and behaviour intention. Similarly, the study conducted by Abed (2021) revealed that the factors of performance and effort expectancy exert a noteworthy impact on the behavioural intention of female entrepreneurs to adopt mobile applications for the purpose of sustaining their businesses. Handoko (2020) has demonstrated that the variables of PE, EE, and PV have a significant impact on the behavioural intention of student entrepreneurs to adopt technology. The assertion is made that the adoption of information technology by young entrepreneurs is contingent upon the cost being commensurate with its perceived value.

Facilitating conditions (FC) is one of the crucial factors in UTAUT, which pertains to the accessibility of resources required to execute a particular behaviour (Venkatesh et al., 2003). Thus, FC as resource readiness refers to female entrepreneurs' opinions on internet-based business resources availability. Another attribute is habit, which is how much women entrepreneurs utilise the internet automatically due to learning and experience (Venkatesh et al., 2012). Hence, they are considered essential latent variables in the current study. We, therefore, posit that :

**H<sub>1</sub>** : There is a significant relationship between a. performance expectancy b. effort expectancy c. price value d. habit e. resource readiness and entrepreneurship motivation.

**H<sub>2</sub>** : There is a significant relationship between a. performance expectancy b. effort expectancy c. price value d. habit e. resource readiness and women's e-entrepreneurship intention.

### ***Entrepreneurial Support Factors, Entrepreneurship Motivation and E-entrepreneurship Intention***

Turker and Sonmez Selcuk (2009) emphasize the importance of contextual factors in entrepreneurship intention studies, even as most of the research focuses on individual characteristics and personality traits. The entrepreneurial support model (ESM) developed by them indicates that entrepreneurial intentions are driven by relational support, educational support, and structural support.

Relational Support is the extent to which women entrepreneurs perceive that important others (e.g., family and friends) motivate and support them to do internet-based business (Venkatesh et al., 2012). The relational support construct is mostly similar to the social influence construct of the UTAUT model or the subjective norm construct of TPB. Educational Support refers to programmes, courses, and activities aimed at developing women entrepreneurs' understanding and knowledge about e-entrepreneurship and e-enterprises and on the other side Government Support refers to measures and practices to motivate women entrepreneurs and to create opportunities for them to innovate and create their e-enterprise (Lai & To, 2020). Yurtkoru et al. (2014) also employed the ESM model to investigate the antecedents of entrepreneurial intention among university students in Turkey.

Entrepreneurship in the country can be encouraged when the social fabric supports the same and only then it will become a viable career option for women (Srivastava & Misra, 2017). Women in entrepreneurship are confronted with various challenges. These challenges can be mitigated or exacerbated depending on the support they get from their male spouses, the general society and the government (Anlesinya et al., 2019). Ali et al. (2019) in their study found that government policies and regulations, government programs and support, social factors and entrepreneurship education and training are significantly associated with the development of entrepreneurial intentions among female Saudi university students. Meeralam & Adeinat (2022) have provided empirical evidences for link between educational support and entrepreneurial intention. Padi et al. (2022) revealed that entrepreneurship course is able to influence female students' entrepreneurial intentions. Ainous (2021) in his study on a sample of 163 university students at the University of Algeria showed that educational and social support factors affect the entrepreneurial spirit of students more than structural support.

Zarnadze et al. (2022) posit that the cultivation of motivation to engage in entrepreneurial activity can be facilitated through education, with universities playing a crucial role in this process. The study also acknowledges the impact of various factors, including political, economic, social, legislative, ecological, and technological factors, on motivation. Hence, they are considered an essential latent variable in the current study. We, therefore, posit that:

**H<sub>3</sub>**: There is a significant relationship between **a.** relational support **b.** educational support **c.** structural support and entrepreneurship motivation.

**H<sub>4</sub>** : There is a significant relationship between **a.** relational support **b.** educational support **c.** structural support and women's e-entrepreneurship intention.

### ***Entrepreneurship Motivation and E-entrepreneurship Intention***

Given that technology is a current necessity, its relationship to entrepreneurship motivational elements must be investigated (Özsungur, 2019). According to Solesvik (2013), "Entrepreneurial motivation refers to the individual beliefs related to how alluring the idea of choosing an entrepreneurial career path in a particular country can be." It might be interpreted in this study as the reason or motivations behind why people create and run electronic businesses. The classification of motivation varies. Researchers have given little thought to the internal and extrinsic motivational elements that influence entrepreneurial inclinations (Arshad et al., 2021). In the context of this research, "entrepreneurial motivation" refers to the factors that encourage individuals to launch and run their own new businesses and it is believed that people who place a high value on both the intrinsic and the extrinsic aspects of beginning a online business venture are more likely to acquire an interest in e-entrepreneurship. (Wang et al., 2016). The concept of intention has been defined by Schlepphorst et al. (2020) as a manifestation of ambition that is shaped by a range of motivational factors, ultimately resulting in observable behaviour. Research has indicated that the motivations to become an entrepreneur plays a crucial role in the formation and enhancement of intention (Solesvik, 2013; Al Jubari et al., 2019; Hassan et al., 2021; Tiwari et al., 2022; Anwar et al., 2022; Saoula et al., 2023). We, therefore, identify it as a latent variable impacting women e-entrepreneurial intention as we propose that :

**H<sub>5</sub>** : There is a significant relationship between entrepreneurship motivation and women's e-entrepreneurship intention.

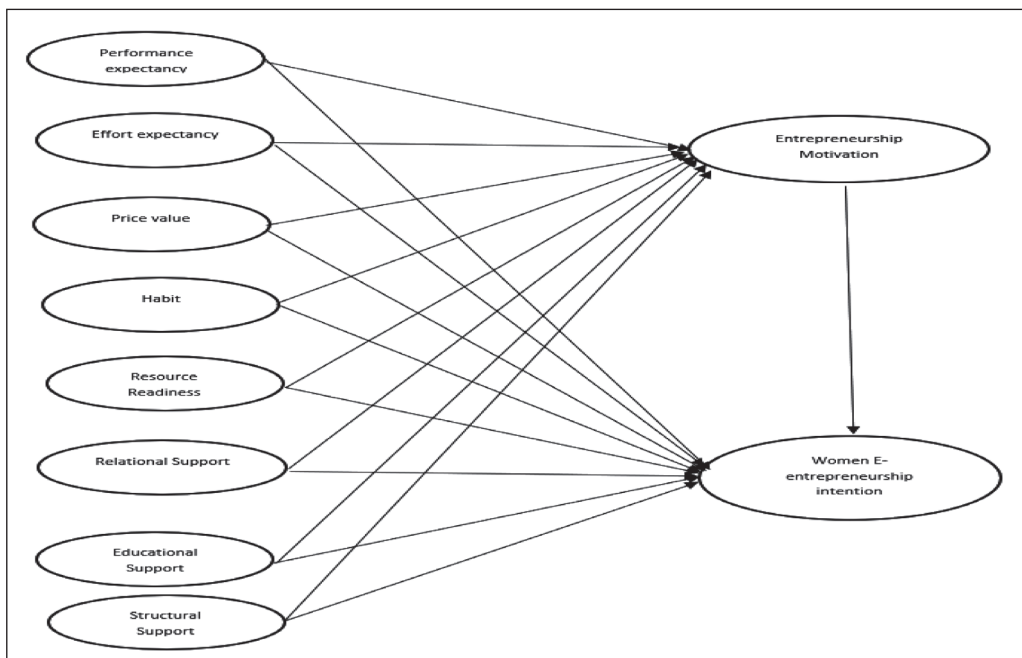
### ***The Mediating Role of entrepreneurship motivation between UTAUT and ESM factors and Women e-entrepreneurship intention***

The findings of Dana et al. (2021) indicate that the inclusion of entrepreneurial education components, such as entrepreneurial skills, entrepreneurial learning, and entrepreneurial intention, have a favourable impact on the development of technology-based businesses which was mediated by motivation. The study conducted by Paliwal et al. (2022) indicate a noteworthy correlation between education and both motivation and intention. The observation has been made that motivation phenomena play a role in promoting the connection between

education and intention. The study conducted by Ghofarany and Satrya (2021) establishes that the influence of relational support and educational support on entrepreneurial intention is mediated by personal attitude. Aleidi and Chandran (2018) conducted a study which found that personal factors, such as attitude and self-efficacy, serve as mediators in the relationship between technological attributes and intention. The study conducted by Sait Dinc and Hadzic (2018) illustrates that personality traits play a mediating role in the relationship between various factors such as business experience, family support, government support, entry barriers to business, and the entrepreneurial intention of women. The present research posits that the association between attributes of e-entrepreneurship and intention, along with the association between entrepreneurial support and intention, could potentially be mediated by motivation. Thus, we posit that:

**H<sub>6</sub>** : Motivation mediates the relationship between a. performance expectancy b. effort expectancy c. price value d. habit e. resource readiness f. relational support g. educational support h. structural support and women's e-entrepreneurial intention.

**Figure-1 : Proposed Research Model**



## Research Methodology

### Data and Sample

A convenience sampling method was used to gather data from female students of Delhi University via a closed-ended questionnaire distributed through Google Forms. Since students are exploring employment options, including starting their own firms, they can help us understand e-entrepreneurship ambitions (Hattab, 2014). The GEM 2020/2021 report on women entrepreneurs in India found that over 50% of them are their age (Elam et al., 2021). In total, 344 responses were received. As we aim to examine the e-entrepreneurship intention of aspiring women entrepreneurs only, thus, we incorporated a filtering question where we asked female students their preferred career choice. As only 246 participants selected self-employment as their preferred career, the remaining 98 responses were dropped from further analysis. In the context of partial least squares structural equation modelling (PLS-SEM), a commonly used approach for estimating the minimum required sample size is the '10-times rule' method (Kock & Hadaya, 2018). This method is based on the premise that the sample size ought to be more than 10 times the highest number of inner or outer model links directed towards any latent variable. The minimum sample size requirement at was 90, therefore sample of 246 was found to be appropriate.

### Measurement Instrument

Based on Kaplan (2009) 4 measures of performance under the balanced scorecard, the items for measuring performance expectancy were chosen. Measures of effort expectancy, price value, facilitating conditions, habit, and relational support are adapted from the work of Venkatesh et al. (2003) and Venkatesh et al. (2012). The items used to measure motivation are adapted from Wang et al. (2016). Educational and structural support items were adapted from Lai & To (2020) and Ben Youssef et al. (2021). The items for e-entrepreneurship intention were adapted from Liñán & Chen (2009). All the items were measured on 5-point Likert-type scales ranging from Strongly disagree to strongly agree. A pilot study was done to validate the survey instrument in which 25 female students were involved.

### Descriptive Statistics

Demographic profile of the respondents was obtained through the last section of the questionnaire. Table-2 presents some background information about the respondents (n=246).

**Table 2. Demographic Profile of the Respondents**

Category	Sub Category	Frequency	Percentage
Age Group	Below 20 years	150	61
	21-30 years	96	39
Computer Training	Yes	123	50
	No	123	50
Entrepreneurial History in Family	Yes	127	51.6
	No	119	48.4
Preferred Sector	Manufacturing	48	19.5
	Service	132	53.7
	Trading	66	26.8
Preferred Industry	Food & Beverages	18	7.3
	Apparel	22	8.9
	Pharmaceuticals	7	2.8
	Electronics	2	0.8
	Machinery & Equipment	12	4.9
	Handicrafts	20	8.1
	Beauty and Wellness	27	11
	Financial & Insurance	55	22.4
	Education	39	15.9
	Software	7	2.8
	Entertainment & Recreation	16	6.5
	Business Support Services	21	8.5

*Source : Author's Calculation.*

## Data Analysis

To test and analyse the hypotheses, structural equation modeling was used by using variance-based partial least square method (PLS – SEM). The model estimation was conducted using the Smart PLS 4 software (Ringle et al., 2022). PLS-SEM is an appropriate approach as the analysis is concerned with testing a theoretical framework from a prediction perspective; by exploring theoretical extensions of established theories (Hair et al., 2019).



## Common Method Bias (CMB) and Multivariate Normality

As in this study self-reported measures are used, therefore there may be chances of common method bias (CMB). The validity of the constructs was investigated through the Common Method Bias (CMB) by applying Harman's Single-Factor test (Podsakoff et al., 2003). The test is applied by loading all variables into one factor with the application of exploratory factor analysis (EFA) in statistical package for social sciences (IBM SPSS 29) software. The results reveal that there is total 30.253% variance which is less than 50% indicating that the data quality was not affected by the problem of common method bias. The study investigated multivariate normality using Mardia's (1970) test by applying web-based calculator (Zhang & Yuan, 2018). The results suggested that the beta values of both multivariate skewness and kurtosis were found to be statistically significant. Thus, the presence of multivariate non-normality in the present study was yet another reason to apply PLS-SEM (Hair et al., 2019).

## Measurement Model

The measurement models are assessed based on (Hair et al., 2019). Reflective measurement models are assessed by examining their indicator loadings, internal consistency (composite reliability and  $\rho_A$ ), convergent validity (average variance extracted i.e. AVE) and discriminant validity (heterotrait-monotrait ratio i.e. HTMT). Table-3 shows the quality criterion of the measurement model. In the measurement model, the majority of indicator loadings are significantly above the recommended threshold of 0.708. except the items WEEI1, PE3, M4 and ES4 which fall below the threshold but above 0.5, as their average variance extracted (AVE) values exceed the threshold of 0.5, so we assume they are also acceptable (Hair et al., 2019). Composite reliability and rho A for all constructs are between 0.70 and 0.95 which is acceptable (Hair et al., 2019). Therefore, all of the latent variables are considered to be reliable and valid. To assess the discriminant validity, we check the HTMT ratio. The results of our study (Table 4) show that all the HTMT ratios are well below the threshold value of 0.85 (Henseler et al., 2015) establishing the discriminant validity of the latent variable.

## Structural Model

The guidelines of on Hair et al. (2019) were applied to assess the structural model results for hypothesis testing and model's explanatory power. Before assessing the structural, the VIF values of the predictor constructs should be checked (strictly close to 3.3 or lower). Collinearity is not a critical issue since the largest inner VIF is 2.981. If collinearity is not an issue, the next step is examining the  $R^2$

**Table-3 : Reliability and Validity of Latent Variable**

Latent Variables	Items	Factor Loadings	Cronbach's Alpha	rhoA	Composite Reliability	AVE
Women E-entrepreneurship Intention	WEEI1	0.652	0.912	0.918	0.933	0.7
	WEEI2	0.843				
	WEEI3	0.870				
	WEEI4	0.892				
	WEEI5	0.897				
	WEEI6	0.840				
Entrepreneurship Motivation	EM1	0.769	0.867	0.874	0.901	0.603
	EM2	0.837				
	EM3	0.810				
	EM4	0.690				
	EM5	0.730				
	EM6	0.815				
Performance Expectancy	PE1	0.781	0.776	0.809	0.856	0.600
	PE2	0.798				
	PE3	0.636				
	PE4	0.864				
Effort Expectancy	EE1	0.828	0.841	0.842	0.893	0.677
	EE2	0.811				
	EE3	0.839				
	EE4	0.813				
Price Value	PV1	0.811	0.811	0.814	0.893	0.726
	PV2	0.863				
	PV3	0.880				
Habit	H1	0.886	0.792	0.848	0.872	0.696
	H2	0.756				
	H3	0.855				
Resource Readiness	RR1	0.875	0.813	0.818	0.890	0.729
	RR2	0.875				
	RR3	0.810				

Relational Support	RS1	0.937	0.915	0.954	0.945	0.852
	RS2	0.907				
	RS3	0.925				
Educational Support	ES1	0.804	0.868	0.896	0.907	0.710
	ES2	0.867				
	ES3	0.830				
	ES4	0.868				
Structural Support	SS1	0.789	0.778	0.865	0.836	0.561
	SS2	0.727				
	SS3	0.675				
	SS4	0.799				

Source : Author's Calculation.

**Table-4 : Discriminant Validity**

	WEEI	M	PE	EE	PV	H	FC	RS	ES	SS
WEEI										
EM	0.574									
PE	0.526	0.805								
EE	0.393	0.69	0.668							
PV	0.412	0.777	0.634	0.551						
H	0.161	0.508	0.314	0.273	0.509					
RR	0.44	0.417	0.373	0.656	0.531	0.173				
RS	0.344	0.556	0.502	0.409	0.548	0.361	0.61			
ES	0.288	0.229	0.169	0.061	0.324	0.302	0.377	0.376		
SS	0.277	0.365	0.357	0.308	0.48	0.438	0.4	0.373	0.598	

Source : Author's Calculation.

value of the endogenous construct(s). As a guideline,  $R^2$  values of 0.75, 0.50 and 0.25 can be considered substantial, moderate and weak (Hair et al., 2019). The coefficient of determination ( $R^2$ ) is 0.364 (WEEI) and 0.665 (Motivation) suggesting that the model has moderate explanatory power or in other words it shows that the study model sufficiently represents the collected data. The model fit index was investigated by standardized root mean square residuals (SRMR). The value of SRMR for estimated model was found to be 0.075, which was less than the critical value of 0.08 (Hair et al., 2019).

In the end, a bootstrapping method was implemented in smart PLS4 to determine the path coefficient and its associated t-value for both the direct and mediating relationships. The current research paper suggested six hypotheses, five of them are direct relationships and one is indirect. The significant predictors of WEEI were found to be performance expectancy ( $\beta = 0.222$ , t-value = 2.742,  $p < 0.05$ ) followed by facilitating conditions ( $\beta = 0.230$ , t-value = 3.573,  $p < 0.05$ ) supporting hypotheses **H<sub>1a</sub>** and **H<sub>1e</sub>**. The other UTAUT and ESM variables namely, Effort expectancy ( $\beta = -0.078$ , t-value = 0.997,  $p = 0.329$ ); Price Value ( $\beta = -0.072$ , t-value = 0.098,  $p = 0.364$ ); Habit ( $\beta = -0.112$ , t-value = 1.832,  $p = 0.067$ ); Relational Support ( $\beta = -0.056$ , t-value = 0.798,  $p = 0.425$ ), Educational Support ( $\beta = 0.130$ , t-value = 1.830,  $p < 0.067$ ) and Structural Support ( $\beta = 0.041$ , t-value = 0.612,  $p = 0.541$ ) are found to be insignificant. Additionally, the results demonstrated a direct positive and significant impact of motivation on e-entrepreneurship intention ( $\beta = 0.416$ , t-value = 4.883,  $p < 0.05$ ) supporting hypothesis **H<sub>5</sub>**.

Whereas, performance expectancy ( $\beta = 0.312$ , t-value = 6.738,  $p < 0.05$ ); effort expectancy ( $\beta = 0.266$ , t-value = 5.204,  $p < 0.05$ ); price value ( $\beta = 0.294$ , t-value = 5.335,  $p < 0.05$ ); habit ( $\beta = 0.157$ , t-value = 3.725,  $p < 0.05$ ), and relational support ( $\beta = 0.150$ , t-value = 2.574,  $p < 0.05$ ) are significant positive predictors of motivation supporting hypotheses **H<sub>3a</sub>** **H<sub>3b</sub>** **H<sub>3c</sub>** **H<sub>3d</sub>** and **H<sub>4a</sub>**. Resource readiness negatively influence motivation ( $\beta = -0.116$ , t-value = 2.109,  $p < 0.05$ ). Thus, hypotheses **H<sub>3e</sub>**. Educational Support ( $\beta = 0.046$ , t-value = 1.123,  $p = 0.261$ ) and Structural Support ( $\beta = -0.035$ , t-value = 0.668,  $p = 0.504$ ) are found to be insignificant. The results of hypotheses testing are summarised in Table-5 and Figure-2.

**Table-5 : Structural Model Assessment**

Outcome (R <sup>2</sup> )	Predictor	Hypotheses	$\beta$	CI		Significant
				2.50%	97.50%	
WEEI (.364)	PE	H1a	0.222	0.068	0.383	YES
	EE	H1b	-0.078	-0.222	0.086	NO
	PV	H1c	-0.072	-0.231	0.084	NO
	H	H1d	-0.112	-0.237	0.001	NO
	RR	H1e	0.230	0.105	0.359	YES
	RS	H2a	-0.056	-0.198	0.080	NO
	ES	H2b	0.130	-0.004	0.274	NO
	SS	H2c	0.041	-0.083	0.180	NO
	EM	H5	0.416	0.24	0.577	YES

EM (.665)	PE	H3a	0.312	0.221	0.402	YES
	EE	H3b	0.266	0.167	0.365	YES
	PV	H3c	0.294	0.185	0.399	YES
	H	H3d	0.157	0.074	0.238	YES
	RR	H3e	-0.116	-0.225	-0.009	YES
	RS	H4a	0.150	0.030	0.263	YES
	ES	H4b	0.046	-0.033	0.129	NO
	SS	H4c	-0.035	-0.126	0.075	NO

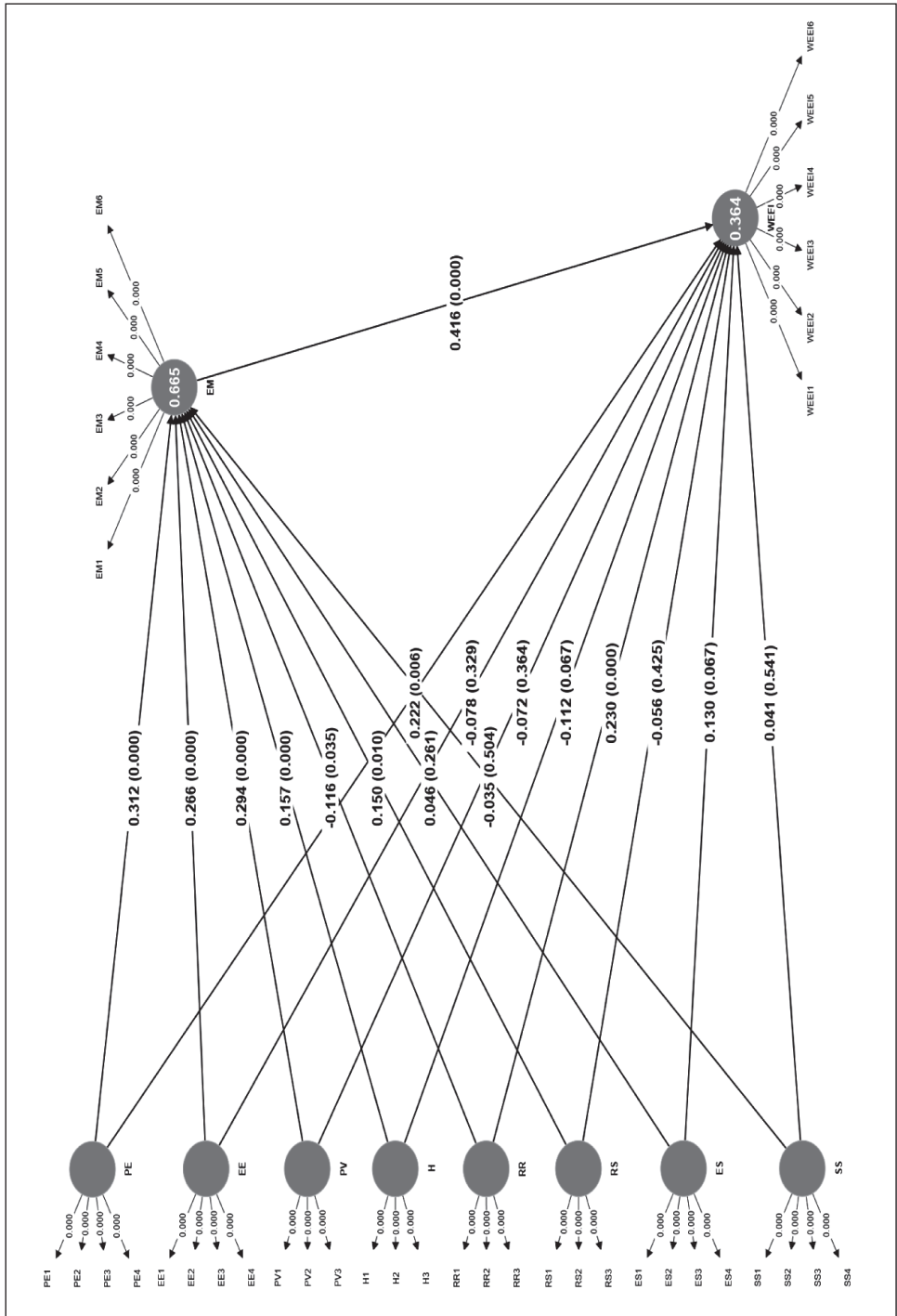
Source : Author's Calculation.

The results also give data about the specific indirect effect to test the mediation effects motivation in the relationship between the UTAUT and ESM variables on women e-entrepreneurship intention (see Table-6). Motivation is found to be significant mediator between performance expectancy ( $\beta = 0.130$ ,  $t\text{-value} = 3.777$ ,  $p < 0.05$ ); effort expectancy ( $\beta = 0.111$ ,  $t\text{-value} = 3.556$ ,  $p < 0.05$ ); price value ( $\beta = 0.122$ ,  $t\text{-value} = 4.002$ ,  $p < 0.05$ ); habit ( $\beta = 0.065$ ,  $t\text{-value} = 2.742$ ,  $p < 0.05$ ); relational support ( $\beta = 0.063$ ,  $t\text{-value} = 0.021$ ,  $p < 0.05$ ); and WEEI. Further we follow the guidelines as given by Zhao et al. (2010) for the mediation analysis.

## Findings and Discussion

According to the study, majority of the respondents (51.6%) belong to entrepreneurial family. In the study, equal percent of the respondents were formally undertaken a computer training. According to the study, 53.7% of women want to establish a business in the service sector, followed by trading (26.8%) and manufacturing (19.5%). Women preferred the finance industry (22.4%) the most, followed by education (15.9%) and beauty and wellness (11%). The least preferred industry to enter is electronics (0.8%). We found only performance expectancy, resource readiness and motivation had a significant relationship with e-entrepreneurship intentions. Nonetheless, the effort expectancy, price value, habit, relational, educational and government support were all insignificant that is they do not have a direct influence on women's e-entrepreneurship intention. As a result of the significance of women's motivation in the form of intrinsic and extrinsic motivation implies that their e-entrepreneurship intention is driven mainly by their own internal reasoning. Contrary to our expectation based on reviewed literature on ESM, the support factors were not the primary factor in building women intention to go for

Figure-2 : Structural Model Analysis



**Table-6 : Results of Mediation Analysis**

	Total Effect $p1^*p2^*p3$		Direct Effect $p3$		Indirect Effect $p1^*p2$							Hypotheses
	$\beta$	p value	$\beta$	p value		$\beta$	Standard Deviation	t statistic	p value	2.50%	97.50%	
PC->WEEI	0.352	0	0.222	0.006	PC->EM->WEEI	0.13	0.034	3.777	0	0.065	0.2	$H_{6a}$ Partial mediation-complementary
EE->WEEI	0.033	0.669	-0.078	0.329	EE->EM->WEEI	0.111	0.031	3.556	0.000	0.054	0.176	$H_{6b}$ Full mediation
PV->WEEI	0.05	0.548	-0.072	0.364	PV->EM->WEEI	0.122	0.031	4.002	0.000	0.064	0.184	$H_{6c}$ Full Mediation
H->WEEI	-0.047	0.471	-0.112	0.067	H->EM->WEEI	0.065	0.024	2.742	0.006	0.024	0.116	$H_{6d}$ Full Mediation
RR->WEEI	0.182	0.011	0.23	0.000	RR->EM->WEEI	-0.048	0.025	1.906	0.057	-0.101	-0.003	$H_{6e}$ No Mediation
RS->WEEI	0.006	0.931	-0.056	0.425	RS->WEEI	0.063	0.027	2.311	0.021	0.012	0.119	$H_{6f}$ Full mediation
ES->WEEI	0.149	0.038	0.13	0.067	ES->M->WEEI	0.019	0.017	1.102	0.271	-0.014	0.056	$H_{6g}$ No Mediation
SS->WEEI	0.027	0.707	0.041	0.541	SS->M->WEEI	-0.014	0.022	0.663	0.507	-0.054	0.033	$H_{6h}$ No Mediation

e-entrepreneurship. Such finding is similar with the findings of Wibowo et al. (2019) who investigated the role of contextual factors on entrepreneurial intention on 300 university students in Indonesia find that, the role of perceived educational support, perceived structural support, and perceived formal network support were not proven.

The findings support prior researches where performance expectancy which describes the benefits offered by e-entrepreneurship over traditional entrepreneurship is found to be a significant predictor of both entrepreneurship motivation and intention among women. Motivational factor significantly predicted e-entrepreneurial intention as found in previous studies. Despite the fact that the direct impact of the variables was not quite powerful enough. In general, it would seem that entrepreneurial motivations and these elements have a significant link with one another, with the degree of entrepreneurial motivation serving as an important component in defining EI. The entrepreneurial motivations have a mediating effect as they serve to explain the performance expectancy; effort expectancy; price value; relational support – e-entrepreneurship intention relationship through partial or full mediation.

### **Theoretical and Practical Implications**

This study aims to fill the gap in the literature by examining the theoretical and empirical interest in women's e-entrepreneurship. One of our primary objectives is to study what drives women business owners to enter the digital sphere. This research revisits the link between technical, individual, and environmental elements and entrepreneurial intention. In the discussion over whether or not these contextual elements are able to predict entrepreneurial intention, the addition of motivations could prove to be useful. According to the findings of this research, these factors play a role in determining entrepreneurial intention via the mediation of motivations.

According to the established findings, educational, relational, and structural support have a negligible influence on both motivation and intention. This is likely due to the fact that there is not a conducive atmosphere for women to look upon them. It is essential that those responsible for practises and policy put their attention on the problem around access. There must be supportive circumstances in place, such as an efficient and beneficial scenario and infrastructure, which may have a big influence on the decision of women to pursue entrepreneurship. The notion of having appropriate means for teaching, assisting, and inspiring individuals to engage in entrepreneurial activity should include as part of educational and structural support. There must be help that is



both genuine and effective. Facilitating the education of female entrepreneurs by providing them with extra training and workshops may be useful in enabling them to take advantage of business opportunities and improve their businesses via the development of online business skills. Government agencies and universities might cooperate to provide training events and workshops.

Women need technical skills since their effort anticipation affects their intention. It has been advised to simplify internet channel applications and features to encourage women to enter this field. The value placed on a product's pricing is a significant factor in determining whether or not a woman will make the switch to digital. Women who are interested in starting their own online businesses need to have access to suitable facilities at a reasonable price. These are the most important aspects that the people responsible for making policy and practising it should focus on. If these concerns were addressed and resolved, women would be more likely to pursue business opportunities on their own. According to the verified findings, the price value has an impact that is both substantial and effective on the motivation. Both policymakers and practitioners have a responsibility to ensure that the costs associated with doing business through the internet are lower than the costs associated with conventional marketing expenditures. If the price is too expensive, women will not be compelled to participate. Because both performance and effort expectations have significant and positive effects on the motivation to start a business, policymakers should ensure that women are made aware of more benefits of digital business. Additionally, awareness campaigns should be run to highlight the advantages offered by online businesses over traditional businesses in order to motivate an increasing number of people. They have to have the mindset that doing business via internet channels would be beneficial, and the functionality has to be simple while at the same time being straightforward.

### **Conclusion, Limitations and Future Research**

By conducting original research that combines established theories from the fields of women's entrepreneurship and information and communication technologies (ICTs) connected to digitalization, with a particular emphasis on intention, this study contributes to an issue that has not received a lot of previous research attention. Because we are now living in a digital world, it is very necessary for women who own businesses to acquire the mentality of digital entrepreneurs and actively seek out new and innovative ways to do business. Following a discussion on the relevance of e-entrepreneurship in the contemporary era, especially for female company owners, we will go on to trying

to build a link between the two predominant forms of entrepreneurship, namely female entrepreneurship and electronic entrepreneurship.

We have presented a conceptual model to investigate the many influencing variables combining UTAUT and ESM that might either promote or discourage women business owners' decisions to pursue e-entrepreneurship as a career path of choice which was appropriately verified by using PLS-SEM analysis. Our study gives more ideas for possible areas of future research that could help solve some of the limitations that were found in this research. The survey did not consider women from other major cities as sample, and it is possible that different outcomes could have been achieved if inputs from women from other locations or simultaneously pursuing other degrees were included. It may be necessary for future study to use much larger samples from different locations in order to generalise the results. A longitudinal study could look at how these factors change as women move from intention to use new tools to actually using them. To make the model better at explaining things, it is possible to add variables that come from different theories about how people accept technology and how women run businesses.

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# Factors Influencing Customer Satisfaction in Online Shopping : An Empirical Study on Siliguri Metropolitan Youth

DEBABRATA MITRA AND NARAYAN PRASAD

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**Abstract :** *Online shopping is done virtually with the help of the Internet and web browser. In online shopping, customers cannot evaluate goods and services based on smell, touch and feel. Hence, it is not so easy to satisfy the customers with an online shopping platform compared to traditional shopping.*

*This study analyses the responses of 266 online shoppers by Statistical Package for Social Sciences (SPSS) to understand customer satisfaction in online shopping. The Exploratory Factor Analysis (EFA) shows that information quality, shopping experience, website quality and delivery time are essential parameters for customer satisfaction in online shopping. Later, the study examines the impacts of each of these online shopping parameters in customer satisfaction by AMOS. The findings of this study show that among these online shopping factors, delivery time (according to the standardized parameter estimation weight) affects customer satisfaction the most in online shopping.*

*The shopping experience, website quality and information quality also affect customer satisfaction (according to their respective standardized parameter estimation weights) in online shopping. This study helps online sellers to list customer satisfaction online shopping parameters and formulate their sales strategy to satisfy the customer. Because satisfied customers become loyal, every loyal customer is vital to building the company's image.*

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**Keywords :** Online Shopping, Information Quality, Shopping Experience, Website Quality, Delivery Time, and Customer Satisfaction.

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## 1. Introduction

The availability of smart electronic devices and affordable internet connectivity facilitate a conducive online shopping environment across the country. In addition, growth in online shopping infrastructure and high internet penetration rates boost online shopping in India. According to the **IAMAI-Kantar ICUBE 2020** report, the number of Indian internet users in 2020 was around 622 million and is expected to grow by 45% over the next five years to 900 million in 2025. The liberal e-commerce policy of the government, such as 100% foreign direct investment (FDI) in B2B (business-to-business) e-commerce, boosted the e-commerce player in the online marketplace. This is the reason that the size of the e-commerce market is increasing year by year. A report published by “**Statista.com1**” reveals that in India, the business-to-consumer (B2C) e-commerce market size was around US\$ 30 billion in 2019 and is expected to grow to US\$ 96 billion in 2024. Online shopping provides convenient shopping as compared to the traditional way of shopping. For example, consumers can search, compare and order their desired goods and services 24x7 without geographical barriers. These online shopping facilities have led to an increase in the number of online shoppers. A report on the number of online shoppers published by “**Statista.com2**” reveals that in 2019, there were around 135 million online shoppers in India, which increased to 150 million in 2020.

The above statistical figures indicate an increase in the size of Internet users, online buyers and the online e-commerce market. However, ensuring customer satisfaction in online shopping is a matter of academic and business research. Because, in online shopping, customers cannot evaluate goods and services by smell and touch. Furthermore, online shopping does not have salespeople who help customers buy goods and services. To understand customer satisfaction in online shopping, academics and researchers have done many researches considering the online shopping parameters. For example, **Momtaz et al. (2011)** attempted to link customer satisfaction to online shopping variables, advertising, product quality, brand and shopping experience.

This study explores how to ensure customer satisfaction in online shopping. For this, the study takes online shopping dimensions such as Information Quality (IQ), Shopping Experience (SE), Website Quality (WQ) and Delivery Time (DT) and proposes a customer satisfaction model in online shopping.

## 2. Review of literature and development of hypothesis

A literature review helps researchers understand a particular research topic and helps identify research gaps. To understand customer satisfaction in online

shopping and to explore the various online shopping dimensions influencing customer satisfaction in online shopping, the researcher designed a review of the literature in the following manner:

### **2.1.Customer satisfaction (CS) :**

Customer satisfaction is essential to business success. Satisfied customers become loyal to the company's products and services and become indirect advertisers of the company's products and services, too [i.e. word of mouth (WOM)]. Many eminent academicians and researchers advocate the importance of customer satisfaction in the business. For example, **Lee et al. (2008)** stated that customer satisfaction helps establish a long-term relationship between the customer and their purchase intention. **Oliver (1980)** advocates that attitude is directly and indirectly influenced by satisfaction and, therefore, is positively related to the customer's future purchase intention. In online shopping, customers cannot interact directly with sellers (i.e. face-to-face). It became difficult for an online seller to satisfy the customers. As **Kim et al. (2006)** pointed out, e-commerce is a technological breakthrough in shopping; therefore, receptivity in the online shopping environment is essential for building a positive relationship with satisfaction. A study done by **Bai et al. (2008)** on tourism products has found that satisfaction plays a vital role in increasing the purchase intention of online products in an online environment. Similarly, in B2C e-commerce, **Tsai et al. (2006)** argue that a significant relationship exists between customer satisfaction and loyalty.

Many online shopping parameters affect customer satisfaction in the online shopping environment, as **Zeithaml et al. (2002)** indicated that online shopping website features affect customer evaluation and satisfaction. **Ballantine (2005)** says that interactivity and product information influence customer satisfaction in online shopping. Similarly, **Kim & Kim (2006)** found that customer satisfaction is influenced by online shopping dimensions, such as safety, convenience and trust. This study takes online shopping parameters, namely Information Quality (IQ), Shopping Experience (SE), Website Quality (WQ) and Delivery Time (DT), and examines their effects on customer satisfaction in online shopping.

### **2.2.Information Quality (IQ) :**

Online buyers make purchase decisions based on information provided by online sellers. In online shopping, sellers' information helps customers find, compare, evaluate and order products and services. This means that the quality of information affects the rational buying decisions of customers in online shopping.

**DeLone and McLean (2003)** show that accuracy, completeness, relevance, content requirements and timeliness are essential determinants of information quality. **Ranganathan and Ganapathy (2002)** consider content and website quality as critical measures in information quality in online shopping; they suggest that online sellers take note of it. **Ahn et al. (2004)** think that customer perception, such as internal and external, to take advantage of Internet shopping malls are enhanced by the quality of information. The quality of information directly affects the decisions and satisfaction of the customers. An empirical study by **Bharti and Choudhury (2004)** supports the view that the quality of information affects customer satisfaction in web-based purchases.

Similarly, **Fung and Lee (1999)** found that customer satisfaction in online shopping platforms is influenced by the web seller's website's interface design and information quality. In short, the findings of previous research advocate that customer satisfaction is influenced by the quality of information a web vendor provides on their website. Therefore, the study hypothesizes that:

**H1 : *The quality of information affects customer satisfaction in online shopping.***

### **2.3.Shopping Experience (SE):**

Online shopping is a technological advancement in the field of shopping. In online shopping, the shopping experience refers to the customer's knowledge of the various elements of the online shopping environment. Online shopping requires customers to be aware of computer operation, Internet, site visits, browsing for products, placing items in cart, availing discounts, selecting payment options, placing orders and tracking shipments. Customers' unfamiliarity with the online shopping environment creates a lot of doubts in their minds, ultimately leading them not to shop online. **Liu et al. (2008)** found that customer shopping experience affects their satisfaction in online shopping. **Zhou et al. (2007)** argue that the shopping experience positively influences customers' intention to shop online. This means that customers' high buying experience increases their satisfaction and ultimately leads them to repurchase with online shopping. It has been observed by **Liang and Huang (1998)** that customers with high expertise in shopping are more likely to continue shopping.

Similarly, **Khalifa and Liu (2007)** show that customer shopping experience mediates between satisfaction and intention to repurchase. Therefore, the study finds that previous research findings suggest that the shopping experience influences customer satisfaction in online shopping. Thus, the study hypothesizes that :

**H2 : *The shopping experience affects customer satisfaction in online shopping.***

## 2.4. Website Quality (WQ):

In online shopping, the website is the online seller's virtual store where customers search, evaluate and order their required goods and services. Website quality is considered a user assessment of the overall performance of the website system (Aladwani and Palvia, 2002). A website can meet the needs of its user only through its high-quality features. Websites with System Quality and Electronic Service Quality (E-SQ) are considered good quality websites because they better engage and serve customers in online shopping, ultimately leading to more sales and profit for online sellers. The overall capabilities of a website system are known as system quality, which gives customers a sense of friendliness while using the website (Lin 2007). DeLone and McLean (2004) observed that the use of e-commerce websites and the business's overall sales and market valuation could be increased through a sound system quality. Electronic Service Quality (E-SQ) is defined as the extent to which a website facilitates efficient and effective purchasing and delivery; therefore, it should comprehensively cover all stages of customer interaction with a website (Parasuraman et al., 2005). It is observed that online sellers' website quality affects customer satisfaction in online shopping. Therefore, the study hypothesizes that :

*H3 : Website Quality (WQ) affects customer satisfaction in online shopping.*

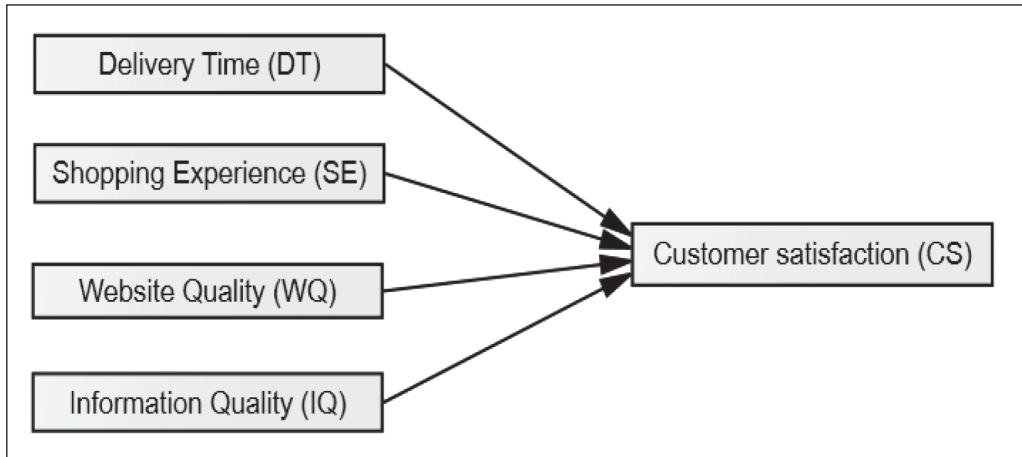
## 2.5. Delivery Time (DT) :

One of the advantages of online shopping is that it delivers goods and services to the buyers' doorstep. In their research, Grewal et al. (2004) and Gurau et al. (2001) have advocated the importance of timely delivery of products in online shopping. Cho (2004) observed that customers' concern about deliveries and returns could undermine transactions. Similarly, Ahn et al. (2004) found that timely and reliable delivery of goods and services leads to increased customer satisfaction; therefore, online sellers must deliver the customer order products and services within the expected delivery time to improve their satisfaction with online shopping. It is noted that previous research advocates the importance of delivery time in customer satisfaction in online shopping. Therefore, the study hypothesizes that:

*H3 : The Delivery Time (DT) affects customer satisfaction in online shopping.*

## 3. Proposed research model

The study draws the research hypotheses based on the literature support. Later, based on the research hypotheses, the study proposes a customer satisfaction model (see Figure-1) for online shopping.

**Figure-1 : Proposed Research Model**

In the proposed research model, Customer Satisfaction (CS) is a dependent variable and Delivery Time (DT), Shopping Experience (SE), Website Quality (WQ), and Information Quality (IQ) are the independent variables in online shopping. In other words, the proposed research model indicates that in online shopping, Customer Satisfaction (CS) is influenced by the online dimension, namely Delivery Time (DT), Shopping Experience (SE), Website Quality (WQ), and Information Quality (IQ).

#### 4. Development of construct measurement

The study designed a structured questionnaire to measure online shopping dimensions (i.e. customer satisfaction, delivery time, shopping experience, website quality, and information quality) that determine customer satisfaction in online shopping, as follows :

- To estimate the **information quality (IQ)**, the study adopts four items from the study of **Ahn et al. (2004)**.
- Three items are taken from the study of **Sabiote et al. (2012)** to assess **website quality (WQ)**.
- Four questions have been adopted from the study of **Chiu et al. (2009)** and **Hsu et al. (2006)** to measure **customer satisfaction (CS)**.
- The study measures the **delivery time (DT)** with the help of three items as determined by **Lee & Joshi (2007)** and **Ahn et al. (2004)**.

- The study adopted three questions to measure **Shopping Experience (SE)** from **Khalifa& Liu (2007)**.

Thus, the study adopted a total of seventeen items from previous studies, including four items of customer satisfaction (CS), three items of website quality (WQ), three items of delivery time (DT), four items of information quality, and three Items of the shopping experience (SE). In accordance with current research needs, all items have been partially modified. All items are rated on a five-point Likert scale, where one represents “strongly disagree”, two represents “disagree”, three represents “neither agree nor disagree”, four represents “agree”, and five represents “strongly agree”. After preparing the questionnaire, the study checks the face validity and content validity of the questionnaire.

Apart from this, the demographic profile of the respondents is also assessed with the help of parameters like gender, age, family income and educational qualification. After that, a pilot study is conducted with 32 college-going students. The pilot study results were satisfactory under the stated objectives of the study; therefore, the questionnaire has been finalized for the final collection of data.

## 5. Collection of Data

To establish the proposed research objectives and hypothesis, the study collected primary data (with the help of a structured questionnaire) from college and university-going students who purchase goods and avail services from online shopping platforms. The questionnaire has two parts; in the first part, the questions relate to assessing customer satisfaction with online shopping. The second part of the questionnaire involves the question of knowing the demographic profile of the respondents. The study applies the snowball sampling method to collect the data. The research area (i.e. geographical area) is confined to the Siliguri metropolis of West Bengal, India.

## 6. Demographic Analysis of Online Customers

The demographic profile of the online shoppers are assessed with the help of parameters like gender, age, family income and educational qualification. Table-1 shows the snap sort of the demographic profiles of the online buyers.

In online shopping, gender influences the customer satisfaction on online shopping platforms. **Garbarino and Strahilevitz (2004)** suggest that men are more likely to purchase goods and services than women in Internet-based shopping. The number of malerespondents in this study is 116, which is 43.60 per cent of the

**Table-1 : Depicts the Demographic Profile of Online Shoppers**

Sl. Nos.	Measure	Items	Frequency	Percentage (%)
	Total (N)		266	100
1	Gender	Male	116	43.6
		Female	150	56.4
2	Age (year)	Up to 21	95	35.7
		Between 22 to 25	171	64.3
3	Educational Qualification	Pursuing Graduate Degree	97	36.5
		Pursuing Master Degree	169	63.5
4	Family income	Up to 2.5 lakh	35	13.2
		Between ₹2.5 lakh to ₹5 lakh	83	31.2
		Between ₹5 lakhs to ₹10 lakh	66	24.8
		Above ₹5 lakh	82	30.8
5	Degree of Internet experience	Up to 6 months	34	12.8
		Between 6 months to 1 year	61	22.9
		Between 1 year to 2 years	64	24.1
		Above 2 years	107	40.2

Source: calculation is based on primary data by SPSS

total respondents. Age is one of the demographic dimensions influencing customers' satisfaction in online shopping (**Khare et al., 2012**). Online shopping mainly affects the youth. Therefore, the study collected data from university and college-going students. The study has 171 respondents aged 22 to 25, more than 64 per cent (see Table 1) of the total respondents. **Bellman et al. (1999)** show that online shoppers have more income than traditional buyers. In this study, 82 respondents had an annual family income (in ) above five lakhs, which is more than 30 per cent of the study sample.

Similarly, previous research findings by **Li et al. (1999)** suggest that online shoppers are expected to have a better education than brick-and-mortar shoppers. In this study, 169 respondents are pursuing their post-graduate degree, which is about sixty-four per cent (see Table -1) of the total study sample. **Brown et al. (2003)** found that shoppers with more experience in online shopping made more frequent purchases. In this study, over 40 per cent (see Table-1) of respondents have above two years of online shopping experience. Thus, the study pinpoints the socio-economic information of online shoppers with the help of their demographic profile data.

## 7. Descriptive analysis of scale items:

Table-2 shows descriptive statistics of online shopping factors (such as customer satisfaction (CS), information quality (IQ), shopping experience (SE), website



**Table-2 : Shows the Descriptive Statistics of Online Shopping Parameters**

Items	N	Minimum	Maximum	Mean	Overall Mean	Std. Deviation	Overall Std. Deviation	Skewness	Overall Skewness	Kurtosis	Overall Kurtosis
IQ1	266	1	5	3.84		1.148		-923		.056	
IQ2	266	1	5	3.69	3.7368	1.154	0.95577	-718	-0.957	-.295	-0.037
IQ3	266	1	5	3.73		1.092		-802		.127	
IQ4	266	1	5	3.68		1.074		-910		.383	
SE1	266	1	5	3.43		1.177		-375		-.675	
SE2	266	1	5	3.55	3.4799	1.172	1.04481	-527	-0.541	-.567	-0.524
SE3	266	1	5	3.46		1.169		-409		-.637	
DT1	266	1	5	3.54		1.229		-499		-.723	
DT2	266	1	5	3.71	3.5614	1.089	1.01632	-631	-0.657	-.215	-0.329
DT3	266	1	5	3.43		1.128		-498		-.431	
WQ1	266	1	5	3.57		1.128		-519		-.412	
WQ2	266	1	5	3.63	3.6140	1.129	0.98402	-648	-0.760	-.279	-0.285
WQ3	266	1	5	3.64		1.118		-648		-.197	
CS1	266	1	5	3.85		1.138		-947		.097	
CS2	266	1	5	3.64	3.7989	1.142	0.99217	-812	-1.032	-.046	-0.057
CS3	266	1	5	3.78		1.111		-856		.124	
CS4	266	1	5	3.92		1.113		-875		-.062	

Source: Calculation is based on primary data by SPSS

quality (WQ) and delivery time (DT)) that influence customers' satisfaction in online shopping. The study takes the help of descriptive statistics such as mean, standard deviation, skewness and kurtosis to check the data normality. The mean and standard deviation values for different dimensions of customer satisfaction in online shopping range from 3.4799 to 3.7989 and 0.95577 to 1.04481, respectively, in online shopping. According to **Hair et al. (2010)** and **Byrne (2010)**, data have a normal distribution if the skewness value is between -2 to +2 and the kurtosis value is between -7 to +7. The overall skewness and kurtosis values of each online customer satisfaction construct ranged from -0.541 to -1.032 and -0.037 to -0.524, respectively. These values are within the prescribed limits of data normality.

## 8. Exploratory Factor Analysis:

The study uses the Exploratory Factor Analysis (EFA) to examine customer satisfaction in online shopping. The various statistical test under the EFA, such as KMO and Bartlett's Test, Communalities, Rotated Component Matrix, and Total Variance Explained, are discussed below:

### 8.1. KMO and Bartlett's Test:

The KMO value indicates sample adequacy in the study. It helps the researcher to understand whether they can proceed with the study data for factor analysis. A value greater than 0.50 KMO is considered sample adequacy for factor analysis with the given data. In this study, a KMO value of 0.894 (see Table 3) allows the researcher to proceed with factor analysis to derive the underlying constructs of customers' satisfaction in online shopping platforms.

Bartlett's Test of Sphericity is used to see if there is a correlation between different dimensions of online shopping. Because, for factor analysis, some of the online shopping dimensions must be correlated. The null hypothesis of Bartlett's Test

**Table-3 : KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.894
	Approx. Chi-Square	3020.144
Bartlett's Test of Sphericity	df	136
	Sig.	.000

Source : calculation is based on primary data by SPSS

of Sphericity is stated as there is no correlation among some online shopping variables. In this study, the calculated value of Bartlett's Test of Sphericity (see Table-3) is significant ( $p < 0.05$ ). It means the null hypothesis is rejected, and the alternate hypothesis is accepted. It indicates that there is an existence of correlation in some of the online shopping variables of customer satisfaction in online shopping.

## 8.2. Communalities:

Communality explains the existence of common variation in a particular variable. Its value lies between 1 and 0. Communality values close to 1 and 0 indicate the presence of a significant and insignificant common variance in a particular variable, respectively.

**Table-4 : Communality of the Online Shopping Parameters Items**

Items	Initial	Extraction
IQ1	1.000	.801
IQ2	1.000	.693
IQ3	1.000	.824
IQ4	1.000	.703
SE1	1.000	.694
SE2	1.000	.854
SE3	1.000	.851
DT1	1.000	.855
DT2	1.000	.850
DT3	1.000	.702
WQ1	1.000	.697
WQ2	1.000	.768
WQ3	1.000	.827
CS1	1.000	.741
CS2	1.000	.749
CS3	1.000	.816
CS4	1.000	.810

Source : Calculation is based on primary data by SPSS.

In factor analysis, the communality value helps the researcher to decide which items should be excluded or included in the study. **Beavers et al.; (2013)** explain that a communality value between 0.25 and 0.40 can be considered a cut-off value; however, a communality value of 0.70 or more is regarded as a better communality value. The calculated communality value of each item of customer satisfaction in online shopping falls within the threshold value (see Table-4), allowing the researcher to retain all items in the study for further analysis.

### 8.3. Rotated Component Matrix:

The study runs EFA using principal component analysis (PCA) and Varimax rotation with Kaiser Normalization to explore the various underlying online shopping dimensions influencing customer satisfaction in online shopping platforms.

**Table-5 : The Rotated Component Matrix**

Items	Component				
	1	2	3	4	5
CS1	.713				
CS2	.736				
CS3	.820				
CS4	.811				
IQ1		.847			
IQ2		.789			
IQ3		.844			
IQ4		.798			
SE1			.732		
SE2			.868		
SE3			.866		
WQ1				.714	
WQ2				.778	
WQ3				.842	
DT1					.810
DT2					.856
DT3					.705

Source : Calculation is based on primary data by SPSS.

Table-5 and the screen plot (see Annex I) show the underlying dimensions of customer satisfaction in online shopping. The rotated component matrix states that customer satisfaction (CS), information quality (IQ), shopping experience (SE), website quality (WQ) and delivery time (DT) are the primary components of customer satisfaction in online shopping platforms.

### 8.4. Total Variance Explained:

The EFA helps the study identify five factors [such as customer satisfaction (CS), information quality (IQ), shopping experience (SE), website quality (WQ) and delivery time (DT)] that influence customer satisfaction in online shopping. Customer satisfaction (CS) and information quality (IQ) explain 17.821 per cent and 17.737 per cent of the variation, respectively.

**Table-6 : Shows the Total Variance Explained by the Online Parameters in Customer Satisfaction**

Factors	Items	Factor Loadings	% of Variance Explained	Cumulative % of Variance Explained
Customer satisfaction (CS)	CS1	.713	17.821	17.821
	CS2	.736		
	CS3	.820		
	CS4	.811		
Information Quality (IQ)	IQ1	.847	17.737	35.558
	IQ2	.789		
	IQ3	.844		
	IQ4	.798		
Shopping Experience (SE)	SE1	.732	14.554	50.112
	SE2	.868		
	SE3	.866		
Website Quality (WQ)	WQ1	.714	14.031	64.143
	WQ2	.778		
	WQ3	.842		
Delivery Time (DT)	DT1	.810	13.715	77.858
	DT2	.856		
	DT3	.705		

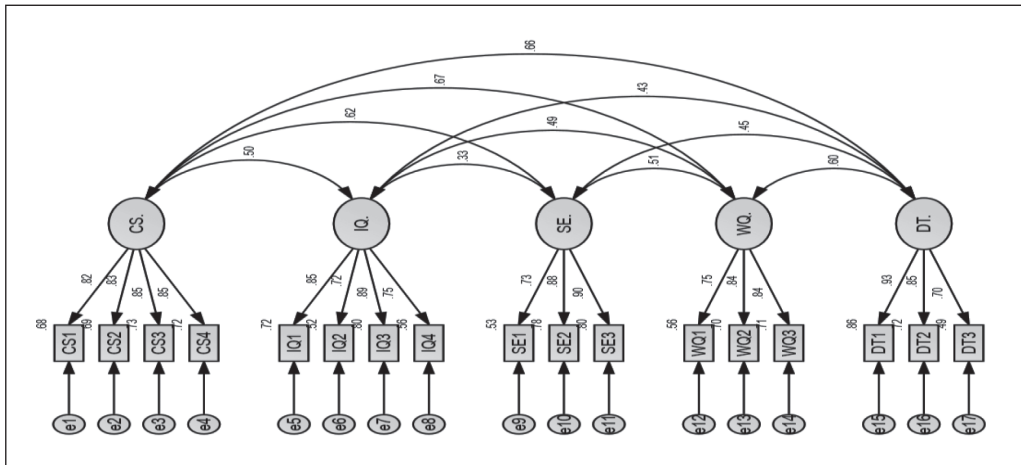
Source : Calculation is based on primary data by SPSS.

Similarly, the shopping experience (SE), website quality (WQ) and delivery time (DT) factors contributed to 14.554, 14.031 and 13.715 variations, respectively, in the total variation. Overall, these factors explain 77.858 per cent of the variation in customer satisfaction in online shopping (see Table 6) platforms.

### 8.5. Measurement Model of customer satisfaction:

In structural equation modelling (SEM), two types of model names, measurement models and structural models, are discussed. The measurement model shows the relationship between latent variables and their measurements.

**Figure-2 : Shows the Measurement Model of Customer Satisfaction in Online Shopping**



Source : Calculation is based on primary data by SPSS and AMOS.

Figure-2 explains the customer satisfaction (CS) measurement model in online shopping. In this model, customer satisfaction (Cs) and information quality (IQ) have four-four measurement items, respectively. There are three-three measurement items for delivery time (DT), shopping experience (SE) and website quality (WQ), respectively.

### 8.6. Reliability of customer satisfaction dimensions:

Reliability indicates the internal consistency between items in a construction. The study examines the construction reliability of online shopping parameters with the help of two tests: the Cronbach alpha ( $\alpha$ ) value and the composite

reliability (CR). **Taber (2018)** stated that a construct is reliable if the construct's Cronbach alpha ( $\alpha$ ) value is equal to or higher than 0.70. The calculated Cronbach alpha ( $\alpha$ ) value (see Table-7) is between 0.846 and 0.904. This indicates the establishment of the construct validity of the dimensions of online shopping customer satisfaction.

**Table-7 : Shows the Reliability of the Online Shopping Dimension**

Factors	Items	Standardized Regression Weights	Cronbach Alpha ( $\alpha$ ) Value	Composite Reliability (CR.)
Customer satisfaction (CS)	CS1	.825	0.904	0.905
	CS2	.831		
	CS3	.852		
	CS4	.846		
Information Quality (IQ)	IQ1	.847	0.878	0.881
	IQ2	.722		
	IQ3	.894		
	IQ4	.751		
Shopping Experience (SE)	SE1	.728	0.870	0.877
	SE2	.885		
	SE3	.895		
Website Quality (WQ)	WQ1	.749	0.846	0.850
	WQ2	.836		
	WQ3	.840		
Delivery Time (DT)	DT1	.925	0.860	0.867
	DT2	.847		
	DT3	.700		

*Source : Calculation is based on primary data by SPSS.*

**Hair et al. (2011)** rated the composite reliability values 0.90 and 0.80 as excellent and fine, respectively. The calculated composite reliability value of customer satisfaction online shopping dimension is 0.850 to 0.905, indicating internal consistency in the construct.

### 8.7. Validity of customer satisfaction dimensions:

The construct validity is measured with the help of convergent validity and discriminant validity. The study estimates the convergent validity of the online shopping dimension of customer satisfaction in online shopping with the help of the average Variance explained (AVE). **Hair et al. (2011)** state that the convergent construct validity is established when the AVE value is above 0.50. Table 8 indicates that the AVE value of the constructs ranges from 0.650 to 0.705. Therefore, convergent construction validity is established.

**Table-8 : Shows Online Shopping Construct Validity**

Constructs	AVE	WQ.	CS.	IQ.	SE.	DT.
WQ.	0.655	<b>0.809</b>				
CS.	0.703	0.666	<b>0.839</b>			
IQ.	0.650	0.491	0.495	<b>0.807</b>		
SE.	0.705	0.514	0.619	0.330	<b>0.839</b>	
DT.	0.688	0.600	0.664	0.428	0.453	<b>0.829</b>

*Source : Calculation is based on primary data by SPSS and AMOS.*

The construct discriminate validity of customer satisfaction in online shopping is established per the **Fornell and Larcker criterion (1981)**. According to this criteria, each latent variable's square Root of AVE (see the diagonal value in Table-8) must be greater than the other correlation values among the latent variables. The calculated value of the square root of AVE in each latent variable is higher than the other correlation value in the variable. Thus, the study established construct validity.

### 8.8. Confirmatory Factor Analysis:

In factor analysis, exploratory factor analysis (EFA) explores the underlying structures influencing customer satisfaction in online shopping. In contrast, confirmatory factor analysis (CFA) is used to test the hypothesis. In other words, CFA establishes the relationship between the observed variables and their underlying latent constructs. So, the study runs CFA to establish the relationship between customers' satisfaction in the online shopping dimension and their latent constructs. But before that, the study checks whether the proposed model (customer satisfaction in online shopping) fits the data. For this, the proposed model is evaluated by several test/fit indices discussed below.



### 8.9. Fit Indices of Customer Satisfaction Model:

Under SEM, the fit index of a structural model (here, customer satisfaction in the online shopping model) is evaluated through chi-square ( $\chi^2$ ), absolute fit measures, incremental fit index and parsimony fit index. The calculated and recommended values of these fit indices are summarised in Table-9.

**Table-9 : Fit Indices**

Fit Indices	Particulars	Recommended value	References	Obtained Value
<b>Overall Model Chi-square (<math>\chi^2</math>)</b>	Chi-square ( $\chi^2$ )	--	--	246.736
	Degrees of freedom ( <i>df</i> )	--	--	109
	<i>p</i> -value	$\geq 0.05$ i.e. Insignificant	<b>Joreskog &amp; Surbom (1996).</b>	<i>p</i> = 0.000
<b>Absolute Fit Measures</b>	Goodness-of-fit index (GFI)	1 = perfect fit $\geq 0.95$ = excellent fit $\geq 0.9$ = acceptable fit	<b>Kline (2005); Hu &amp; Bentler (1998).</b>	0.906
	Root mean square error of approximation (RMSEA)	$\leq 0.05$ = reasonable fit	<b>MacCallum et al. (1996).</b>	0.069
	Root mean square residual (RMR)	$\leq 0.05$ = acceptable fit $\leq 0.07$ = acceptable fit	<b>Diamantopoulos &amp; Sigauw (2000); Steiger (2007);</b>	0.066
	Standardized root mean residual (SRMR)	$\leq 0.05$ = acceptable fit	<b>Diamantopoulos &amp; Sigauw (2000).</b>	0.0512
	Normed chi-square ( $\chi^2/df$ = 246.736/109)	$\leq 3$ = acceptable fit $\leq 5$ = reasonable fit	<b>Marsh &amp; Hocevar (1985).</b>	2.264
<b>Incremental Fit Indices</b>	Comparative fit index (CFI)	1 = perfect fit $\geq 0.95$ = excellent fit $\geq .90$ = acceptable fit	<b>West et al. (2012); Fan et al. (1999).</b>	0.953
<b>Parsimony Fit Indices</b>	Adjusted goodness-of-fit index (AGFI)	$\geq 0.90$ = acceptable fit	<b>Tabachnick et al. (2007).</b>	0.868

Source: based on primary data by SPSS and AMOS.

The chi-square ( $\chi^2$ ) value indicates the difference between the expected and the observed covariance matrix. **Joreskog and Surbom (1996)** suggest that a chi-square ( $\chi^2$ ) *p*-value greater than 0.05 indicates that the proposed model fits the data. The obtained value of the chi-square ( $\chi^2$ ) *p*-value (*p*<0.05) is less than the specified value (see Table-9), indicating that the data does not fit the model. However, we know that the chi-square ( $\chi^2$ ) *p*-value is very sensitive to the sample size. Therefore the researcher must apply other appropriate indices to test whether the proposed model fits the data.

The study evaluates absolute fit measures of customer satisfaction in online shopping models with the help of the Goodness-of-Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residual (RMR), Standardized root means residual (SRMR) and normalized chi-square ( $\chi^2/df$ ). The calculated value of the various fit indices (GFI = 0.906; RMSEA = 0.069; RMR = 0.066; SRMR = 0.0512 and  $\chi^2/df = 2.264$ ) falling under the absolute fit measure is within the recommended level (see Table-9). Hence the absolute fit measure of the proposed model (customer satisfaction in online shopping) has been established.

Incremental fit indexes of customer satisfaction in the online shopping model are established using the Comparative Fit Index (CFI). The calculated CFI of customer satisfaction in online shopping is 0.953, specifying the establishment of incremental fit indices.

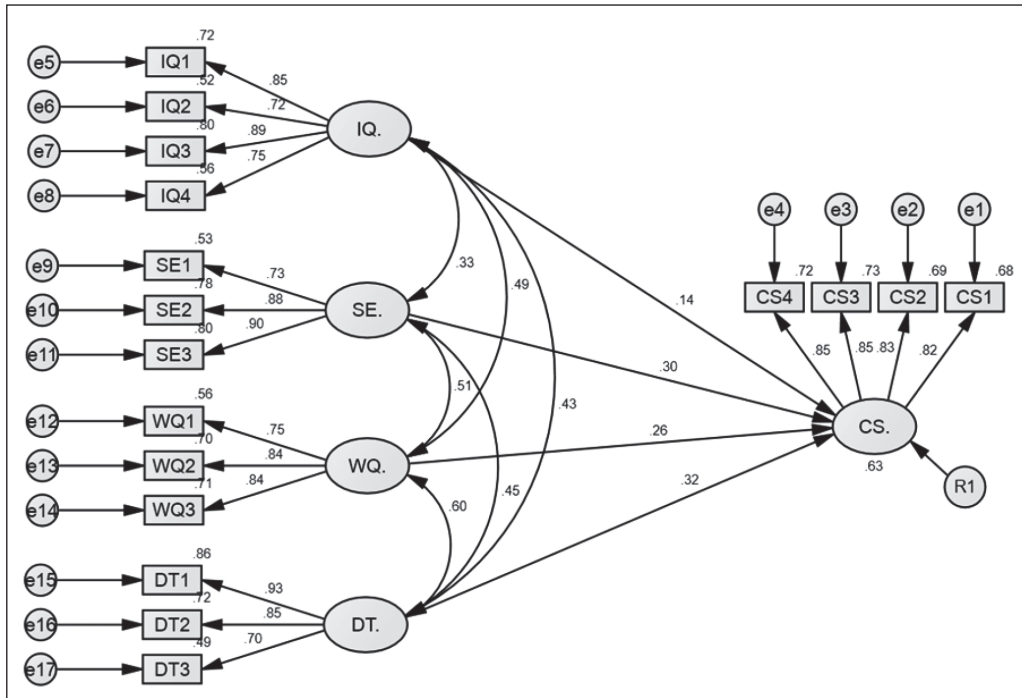
The calculated value of the Adjusted Goodness-of-Fit Index (AGFI) is 0.868 indicating the unacceptability of the model's Parsimony Fit index. However, the AGFI value is very close to the acceptable range of the Parsimony Fit Index of customer satisfaction in the online shopping model.

### **8.10. Structural Model of Customer Satisfaction:**

The study developed the structural model using AMOS of Structural Equation Modelling (SEM). The structural model of customer satisfaction in online shopping shows the causal relationship of online shopping dimensions, such as delivery time, shopping experience, website quality, and information quality, on customer satisfaction. In other words, the structural model of customer satisfaction in online shopping (see Figure-3) is used to test the proposed research hypothesis.

Figure-3 shows that customer satisfaction (CS) in online shopping is influenced by four vital online shopping dimensions, delivery time (DT), shopping experience (SE), website quality (WQ), and information quality (IQ). In addition, Figure 3 also reveals that the squared multiple correlations (R<sup>2</sup>) of customer satisfaction in online shopping is 0.63. It means that the proposed model of customer satisfaction in online shopping explains the Variance of 63 per cent with the help of four online shopping parameters delivery time (DT), shopping experience (SE), website quality (WQ), and information quality (IQ).

**Figure-3 : Reflects the Structural Model of Customer Satisfaction in Online Shopping**



Source : Calculation is based on primary data using SPSS and AMOS.

### 8.11. Testing of hypothesis:

This study tests the research hypothesis with the help of Analysis of Moment Structures (AMOS) to examine the impact of online shopping dimensions (such as delivery time, shopping experience, website quality, and information quality) on customer satisfaction in online shopping. Table-10 shows the statistical results of the proposed research hypothesis produced by AMOS.

The study briefly discusses the results of hypothesis testing as follows :

- The effect of information quality (IQ) on customer satisfaction (CS) in online shopping is positive and significant ( $b = 0.135$ ,  $t = 2.372$ ,  $p < 0.05$ ), which supports the study's proposed hypothesis H1 (See Table 10).

**Table-10 : Illustrate the Testing of the Hypothesis**

Hypothesis	Hypothesized Path	Standardized Parameter Estimate	Standard Error	t - Value	p-Value	Decision
H <sub>1</sub>	IQ ----> CS	0.135	0.055	2.372	0.018*	Supported
H <sub>2</sub>	SE ----> CS	0.299	0.067	4.891	***	Supported
H <sub>3</sub>	WQ ----> CS	0.256	0.082	3.469	***	Supported
H <sub>4</sub>	DT ---->CS	0.317	0.054	4.851	***	Supported

Source: Calculation is based on primary data with the help of AMOS

Note: \*  $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

- The effect of the shopping experience (SE) on customer satisfaction (CS) in online shopping is positive and significant ( $b = 0.299$ ,  $t = 4.891$ ,  $p < 0.001$ ), which supports the study's proposed hypothesis H2 (see Table-10).
- The effect of the website quality (WQ) on customer satisfaction (CS) in online shopping is positive and significant ( $b = 0.256$ ,  $t = 3.469$ ,  $p < 0.001$ ), which supports the study's proposed hypothesis H3 (see Table 10).
- The effect of the delivery time (DT) on customer satisfaction (CS) in online shopping is positive and significant ( $b = 0.317$ ,  $t = 4.851$ ,  $p < 0.001$ ), which supports the study's proposed hypothesis H4 (see Table 10).

## 9. Major Research Findings

The study's main objective is to understand customer satisfaction in online shopping. To fulfil the purpose of the study, first, the study explores the underlying online shopping parameters [information quality (IQ), shopping experience (SE), website quality (WQ) and delivery time (DT)] that influence customers in online shopping. Later, the study proposes a customer satisfaction model for online shopping, considering the relevant online shopping dimension. And finally, the study examines the effects of these online shopping parameters on customer satisfaction in online shopping. The major research findings are as follows :

- The online shopping parameter, that is, delivery time (DT), emerged as a significant factor (H4) influencing customer satisfaction in online shopping (see Table-10) as compared to other online parameters taken in the study. It means that online sellers are expected to deliver customer-ordered online goods and services on time to build customer satisfaction in online shopping.

- The study findings suggest that customer shopping experience (SE) related to online shopping emerges as the second crucial online parameter (H2) that influences customer satisfaction (see Table-10). In other words, customers familiar with the online shopping environment can easily buy products online. Online shopping websites that are unorganized and annoying lead customers to leave their shopping process in the middle. Hence online sellers are suggested to design their online shopping websites customer friendly.
- In online shopping, the website is regarded as equivalent to a physical store in virtual shopping. Customers access online shopping sites with the help of the Internet and browser to shop online. The findings of the study reveal that online vendors' Website Quality (WQ) (H3) affects customers' satisfaction in online shopping (see Table 10). Website quality, such as security and navigation, influences customer satisfaction in online purchases. The customer uses to share financial (bank card details) and personal data (name, mobile number, address, etc.) while shopping online. Unauthorized access to these data may affect customers financially and emotionally. Hence, online sellers must ensure that customer data must be secure and properly disposed of after complications of the transaction. Smooth navigation throughout the online vendor website facilitates the customer to quickly go to the requested webpage. It helps customers instantly access required products and services to make a rational purchase decision.
- The study findings suggest that information quality (IQ) affects customer satisfaction the least (H1) in online shopping (see Table 10). However, the study suggests online sellers to provide detailed product and service descriptions. Online sellers can take the help of graphical representations and put videos and images about the effects on their websites. It helps customers to make product evaluations and purchase decisions. Because in online shopping, customers cannot evaluate goods and services by touch and smell.

## 10. Limitations of Research

The study proposed a customer satisfaction (CS) model in online shopping based on online shopping parameters, namely information quality (IQ), shopping experience (SE), website quality (WQ) and delivery time (DT). However, the study has the following research limitations :

- The geographical area of study is concentrated in only one metropolitan city, Siliguri. In other words, the study's findings are based on responses gathered from just one metropolis. Therefore, it would be unfair to generalize customer satisfaction in online shopping based on the results of this study. The upcoming researchers hope to collect data from online shoppers spread across the country (using an appropriate sampling method) to understand customer satisfaction in online shopping more accurately.
- The study respondents are the only young (especially college and university-going students) online shoppers. This means the study did not take responses from other online shoppers (such as housewives, professionals and the elderly).
- The study included online shopping parameters such as Information Quality (IQ), Shopping Experience (SE), Website Quality (WQ) and Delivery Time (DT) (based on literature support), which affect customer satisfaction. These online shopping parameters are indicative only, not an exhaustive list. Since online shopping is based on technology, technological developments can lead to a new online shopping parameter that can affect customer satisfaction in online shopping.

## **11. Conclusion**

Online shopping is becoming an essential part of everyone's life. However, satisfying the customer in the online shopping platform is challenging compared to the traditional (offline) marketplace. Online sellers must deliver goods and services to the customer on time. It enhances customer satisfaction in online shopping. Customer shopping experience affects their satisfaction in online shopping. Thus, online sellers are requested to design their online shopping site customer friendly so that even a new buyer can easily buy goods and services through their online shopping site. Customers are hesitant to make an online purchase if the online seller's website does not respond quickly. It is expected that online sellers should ensure fast navigation facilities on their online websites. In online shopping, customers evaluate goods and services based on information provided by online sellers on their websites. Insufficient, discrepancy and misinformation negatively affect customer satisfaction. Therefore, online sellers must display complete product information (including product descriptions, visuals and videos) to promote customer satisfaction in online shopping.

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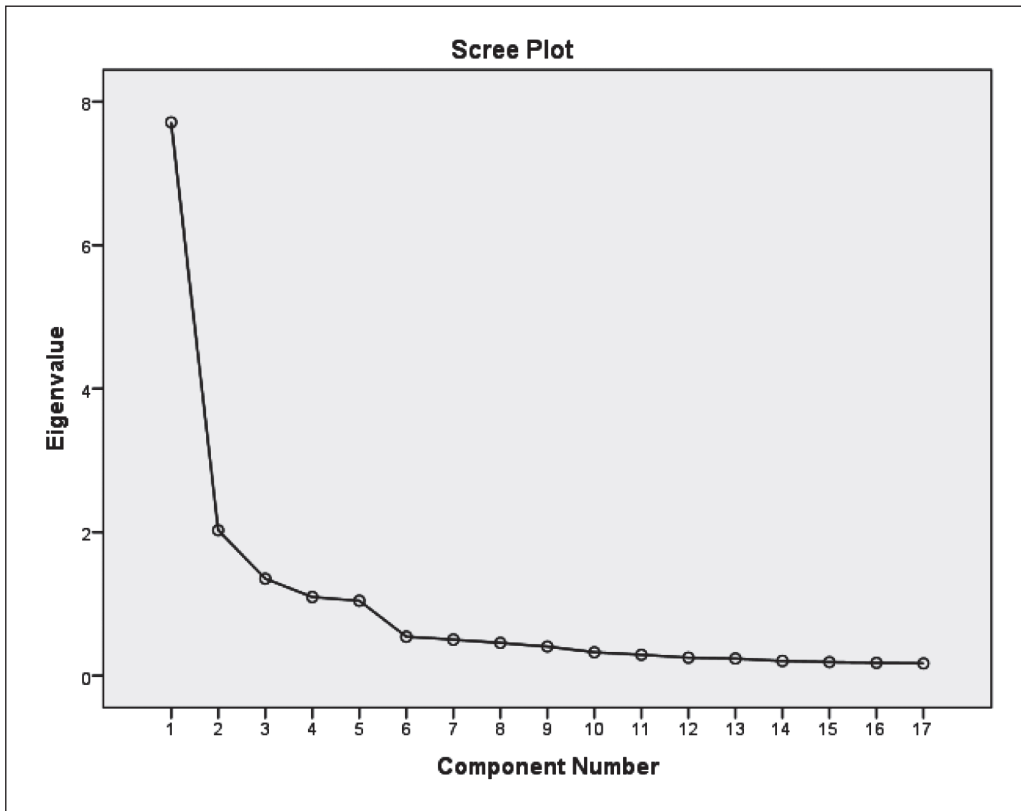
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**Annexure-I : The screen plot identifies the online shopping factors (based on the eigenvalue higher than one) influencing customer satisfaction in online shopping**



**Annexure II :**

Annex II shows the measurement items of various online shopping dimensions.

Sl. Nos.	Parameters	Measurement Items	Adopted from
1	<b>Customer Satisfaction (CS)</b>	CUSAT1: I think buying the product from the online store is a good idea.	<b>Chiu et al. (2009); and Hsu et al. (2006)</b>
		CUSAT2: I am pleased with the experience of buying the product from the online store.	
		CUSAT3: I like to buy products from online stores.	
		CUSAT4: Overall, I am satisfied with the experience of buying the product from the online store.	
2	<b>Website Quality (WQ)</b>	WEBQ1: It is easy to get anywhere on the site.	<b>Sabiote et al. (2012)</b>
		WEBQ2: The website protects personal information.	
		WEBQ3: The website has a lot of information.	
3	<b>Information Quality (IQ)</b>	INFQ1: Online shopping website provides complete information.	<b>Ahn et al., (2004)</b>
		INFQ2: Online shopping website provides detailed information.	
		INFQ3: Online shopping website offers accurate information.	
		INFQ4: Online shopping website provides reliable information.	
4	<b>Delivery Time (DT)</b>	DELT1: The online store delivers the purchased goods on time.	<b>Lee &amp; Joshi (2007); and Ahn et al. (2004)</b>
		DELT2: Products offered at online stores are securely packaged.	
		DELT3: The online store provides a tracking facility to track the expected delivery of my purchased goods.	
5	<b>Shopping Experience (SE)</b>	SHOPE1: I shop for stuff/goods online extensively.	<b>Khalifa &amp; Liu (2007)</b>
		SHOPE2: I have used the Internet for shopping for a long time.	
		SHOPE3: I often buy stuff/goods online.	

# Social Media Marketing : An Influence of Visual and Auditory Perception among Selected Social Media Platforms

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**Abstract :** *The objective of this research is to find the best social media platform from the selected platform for the producers to market their products. We adopted the procedure called survey methodology to collect retorts from 144 active social media users who dwell in the number one metropolitan city of Tamil Nadu. This research explores consumers' expectations of product information who is marketing on social media. The outcome indicates that users of the different platforms are aware of social media marketing with an 84% share. They all prefer to watch the promotion for about 30 seconds with a share of 36 % which made us clear that marketers' presentation of products on various platforms is not up to the user's expectations. It is observed from this study, among 144 answerers most of the users spend more time on Instagram with a share of 33.9% . To conclude promoters and marketers are advised to use the social media platform where users spend more time.*

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**Keywords :** Social Media, Auditory, Visual, Marketing, Platforms, Perception.

## 1. Introduction

People connected through the internet are like an association of people in the real world. Creating a strong association when it comes to ideas that are shared, supporting the fellow person in their needs, ideas, and thoughts shared, opinions and suggestions, and having identity vary from the actual-world community to the web community (Eun- ju Seo and Jin-Woo Park, 2018). Applications that connect people in both formal and informal ways urge the system of marketing, promotion, and advertisement to move to the next step. A marketer who uses the best possible way to attract user cum consumers can use both formal and

informal platforms to market their products and services. Now a day entertainment media platform plays a vital role in attracting more consumers such as YouTube and Instagram. The creation of content is an important aspect in an informal way of marketing because this media consumes less cost when compared to the traditional way of advertising. This is possible because of the growth of the internet and platforms which connect people all over the world. The observed information gives the correlation between age and usage along with product with social media users (Bernardus F. Maseke, 2022). With the intention of this, our research focuses on various informal social media platforms in marketing their products with visual and auditory perception.

## **2. A Selected Review of the Literature**

(Jayashri Sadanand Lokhande, 2023) has brought out marketing on social media platforms plays a vital role in creating awareness about the product because these platforms have billions of followers which can influence B2B and B2C marketing. The author said that the emergence of the internet era, the availability of various platforms, and the effectiveness of content creation help to reach potential consumers by marketing their products and service.

(Huzida Roza Husin & Amran Harun, 2019) have discovered that communication through the internet paves the way for many social media platforms and applications to connect people from various countries. In this research, the author implied that marketing consists of two new dimensions among various dimensions such as entertainment and perceived trust. He also concluded that when a producer markets his product through social platforms he has to impress the user individually, and in communities (Online) and should fulfill their trust to be successful.

(Dr. Sugandha Agarwal, Ankur Kumar & Pragya, 2019) In this research authors has exposed the influencing customers through various platforms plays an important role in Experiencing and customary promoting correspondence through appearance. According to this research, the author insisted that appearance and online networking plays an effective role in making the availability of products to their customers. This paper put forth the implementation, analysis, and results of some social media marketing strategies by various brands in different products. He also concluded that enabling their customer to have social discussions about their products helps to increase the social communities through social media which in turn helps in marketing.

(Fatma Ozge et al., 2019) In this research, the author examined the ocean transportation companies through an informal platform called Facebook. The

author found that posts that are related to public image and on occasion are shared in high and had an advantage in an increase in followers. He also concluded that the maritime industry has a very small share of the logistics sector in terms of social media usage efficiency. He also suggested that this type of research can also be carried out on other social media tools such as Twitter, Instagram, and LinkedIn.

(Raman P et al., 2003) The authors conducted a study on the users of the B2C web which focus on observing the reasons for the influence of online and browsing attitudes of consumers. In this research, the author focused on buying attitude of a consumer with various demographic features, which serve strategies to marketers focus on buying and consumer behavior of particular goods and services.

(Livingstone S, 2010) has give explanation about the applications which help in social connection online like Facebook, Twitter, and Instagram are crucial for showcasing a user's uniqueness and relationships with others. He also underlined the need for teenagers to prioritize identity protection when utilizing various social media platforms.

(Huang Jen-Hung &Yang Yi-Chun, 2010) The author compared the motivations of male and female adolescents who purchase online based on convenience, choice, informational ease, lack of social interaction, cost-savings, adventure, social value, and authority. On the subscale of knowledge available, however, ladies scored noticeably higher than males did. Based on their research, the authors concluded that whereas female adolescents place more value on adventure, socialization, and fashion, male adolescents have more positive opinions regarding the convenience of online purchasing.

(Monika Sharma & Deepshika Karlra, 2011) Researchers have evaluated whether respondents were likely to recommend products to others via online social media, if they trusted other influencers on the platform, and whether they were impacted by influencers while making a purchase decision. The study found that 24% of consumers in Delhi agreed that online Social Media Marketing (SM) is extremely trustworthy and that 30% of consumers in Delhi acknowledged a very positive influence of social media on consumer goods purchase decisions.

(SisiraNeti, 2011) Her ideas behind this research related to online marketing through various platforms, as well as related topics like their improvements and benefits, their significance and purpose in creating awareness, their methods, and a general review of social media marketing in India. She concluded that the exponential growth of the social media phenomenon is mind-boggling. Global

businesses have used the best possible online platform for branding and to innovate in advertising crusades.

To discover the user's perception of social media advertising, their response to it, and their intention to purchase are all influenced by brand consciousness and awareness. For this, the researcher has conducted research on advertising effects on social media by collecting answers from active users of media. The results implicate that people aged between 18 to 35 years who spend more time are termed as more users in the online luxury industry (Yoojung Kim Shu-Chuan Chu & Sara Kamal, 2010).

### **3. Objectives and Limitations of the Study**

- To study the demographical profile and usage preference of the internet community.
- To explore preferences in social platforms.
- Visual and Auditory perception of the marketing of products.
- The number of participants is restricted to 144 due to expenses incurred.

### **4. Data and Methodology**

The present survey is empirical and descriptive. The collection of data is based on the survey method and framed questions were issued to 144 active social media users residing in Chennai city. Visual and Auditory perception variables for marketing product variables were calculated by a typical five-point level. To check the reliability of the scale, Cronbach's Alpha reliability coefficient was used; Kolmogorov-Smirnov and Shapiro-Wilk tests is used to test the normality. Further, to measure the perception Multivariate and Measurement model fit is applied.

The data collected were subjected to analysis using SPSS and tools such as Percentage analysis, mean rank, Descriptive analysis, a test of normality, reliability, multivariate test, and measurement model has been used to derive the articulate answer. The potential investigation is made to understand the population of the users of social media in Table-1.

Table-1 exhibits that answerers are male (67.4%), whose age falls in 18-25 years (80.6%), with their qualification of under graduation (73.6) and marital status of single (94.4%). The majority of respondents are unemployed & students with family annual income below 5 Lakhs, who are under the nuclear family (59%)



**Table-1 : Demographic Segmentation**

<b>Demographic Characteristics</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
Below 18 Years	18	12.5
18 Years - 25 Years	116	80.6
25 Years - 35 Years	7	4.9
35 Years - 55 Years	2	1.4
Above 55 Years	1	0.7
<b>Gender</b>		
Male	97	67.4
Female	47	32.6
<b>Educational Qualification</b>		
School Level	16	11.1
Graduate	106	73.6
Post Graduate	18	12.5
Professional	4	2.8
<b>Occupational Status</b>		
Salaried	17	11.8
Self Employed	28	19.4
Professional	5	3.5
Retired	1	0.7
Unemployed / Students	93	64.6
<b>Family Annual Income (In Rs.)</b>		
Below Rs.5 lakhs	136	94.4
5 - 7 lakhs	5	3.5
7 - 10 lakhs	2	1.4
Above 10 lakhs	1	0.7
<b>Nature of Family</b>		
Nuclear	85	59.0
Joint Family	45	31.3
Single Parent	14	9.7
<b>Marital Status</b>		
Single	136	94.4
Married	8	5.6

**Table-2 : Perception Profile of Social Media Usage**

<b>Perception Profile of Social Media Usage</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Are you an active social media user?</b>		
Yes	121	84.0
No	23	16.0
<b>Total Time spent on Facebook per day</b>		
Less than 1 Hour	33	22.9
One to Two hours	5	3.5
Two to Three hours	4	2.8
There to Four hours	2	1.4
Never	100	69.4
<b>Total Time spent on YouTube per day</b>		
Less than 1 Hour	68	47.2
One to Two hours	46	31.9
Two to Three hours	11	7.6
There to Four hours	5	3.5
More than FiveHours	4	2.8
Never	10	6.9
<b>Total Time spent on Instagram per day</b>		
Less than 1 Hour	38	26.4
One to Two hours	48	33.3
Two to Three hours	26	18.1
There to Four hours	10	6.9
More than Five Hours	10	6.9
Never	12	8.3
<b>Total Time spent on Twitter per day</b>		
Less than 1 Hour	29	20.1
One to Two hours	7	4.9
Two to Three hours	2	1.4
There to Four hours	1	0.7
Never	105	72.9
<b>Total Time spent on Telegram per day</b>		
Less than 1 Hour	59	41.0
One to Two hours	11	7.6
Two to Three hours	5	3.5

There to Four hours	1	0.7
Never	68	47.2
<b>Total Time spent on LinkedIn per day</b>		
Less than 1 Hour	32	22.2
One to Two hours	4	2.8
Two to Three hours	4	2.8
Never	104	72.2
<b>Total Time spent on Snapchat per day</b>		
Less than 1 Hour	72	50.0
One to Two hours	16	11.1
Two to Three hours	3	2.1
There to Four hours	2	1.4
More than 5 Hours	5	3.5
Never	46	31.9
<b>Total Time spent on Tumblr per day</b>		
Less than 1 Hour	22	15.3
One to Two hours	1	0.7
Never	121	84.0
<b>Total Time spent on Share chat per day</b>		
Less than 1 Hour	32	22.2
One to Two hours	4	2.8
Two to Three hours	1	0.7
There to Four hours	1	0.7
Never	106	73.6
<b>Are you aware of social media marketing?</b>		
Yes	104	72.2
No	40	27.8
<b>If yes how many minutes do you like to content the promotion</b>		
Below 30 Seconds	52	36.1
30 - 45 Seconds	29	20.1
1 Minute	11	7.6
1 - 2 Minutes	8	5.6
2 - 5 Minutes	4	2.8
Not Like	40	27.8

Table-2 implies that there are active social media users among answerers (84%) who spend less than 1 hour on various social media platforms such as Facebook (22.9%), YouTube (47.2%), Twitter (20.1%), Telegram (41%), LinkedIn (22.2%), Snapchat (50%), Tumblr (15.3%), share chat (22.2%). Apart from the above statement, some users spend an additional 1-2 hours on Instagram (33.3%) with awareness of social media marketing (72.2%) who have a preference for watching the promotion of the content when it is below 30 seconds (36.1%).

**Table-3 : Mean Rank Based on Social Media Platforms Usage**

Social Media Platforms Usage	Mean	SD	Rank
YouTube	8.29	1.158	II
Facebook	7.08	1.454	VIII
Tumblr	6.76	1.478	IX
Telegram	8.19	1.208	IV
Twitter	7.88	1.343	VI
LinkedIn	8.17	1.312	V
Share chat	7.63	1.457	VII
Instagram	8.53	1.017	I
Snapchat	8.28	1.233	III

Table-3 presents the mean rank based on the usage of selected social media platforms. Instagram ranked number one with the highest mean and standard deviation (Mean=8.53; SD=1.017). This is followed by the platform YouTube (Mean=8.29; SD=1.158), Snapchat (Mean=8.28; SD=1.233), Telegram (Mean=8.19; SD=1.208), LinkedIn (Mean=8.17; SD=1.312), Twitter (Mean=7.88; SD=1.343), Share chat (Mean=7.63; SD=1.457), Facebook (Mean=7.08; SD=1.454) Tumblr (Mean=6.76; SD=1.478). Overall, the table concludes that promoters can use first these three best platforms for the promotion of products.

Table-4 indicates that standard deviation values are lower than the mean values it has a robust measure of distribution. Further, Skewness values prove that there is a normal distribution in the measurement of variables. It also shows that Cronbach's Alpha values for all types of platforms are high (Above 0.700). Therefore, there is high consistency in the measurement of different types of marketing variables and also the scaling is exceedingly consistent. It also indicates the test of normality in which the variables are  $>0.05$ .

**Table-4 : Descriptive Statistics and Test of Normality of Visual and Auditory Perception of Marketing Variables**

Visual and Auditory Perception of Marketing Variables	Descriptive Statistics						Tests of Normality		Reliability
	Mean	Std. Error	SD	Variance	Skewness (Std. Error = 0.202)	Skewness (Std. Error = 0.401)	Kolmogorov-Smirnov <sup>a</sup>	Shapiro-Wilk	
							Statistic (df = 144)	Statistic (df = 144)	Cronbach's Alpha
Facebook	2.618	0.088	1.054	1.112	-0.214	-0.975	0.183*	0.916*	0.926
YouTube	3.128	0.080	0.962	0.926	-0.512	-0.465	0.169*	0.935*	0.931
Instagram	3.078	0.089	1.069	1.142	-0.159	-0.508	0.158*	0.949*	0.948
Twitter	2.589	0.085	1.024	1.049	-0.052	-0.752	0.191*	0.922*	0.958
Telegram	2.648	0.084	1.014	1.027	-0.113	-0.886	0.192*	0.929*	0.954
LinkedIn	2.587	0.091	1.092	1.192	-0.015	-1.006	0.161*	0.921*	0.951
Snapchat	2.764	0.090	1.083	1.172	-0.067	-0.787	0.184*	0.933*	0.971
Tumblr	2.318	0.086	1.036	1.074	0.283	-0.756	0.155*	0.906*	0.959
Share chat	2.422	0.083	1.000	1.000	0.124	-0.876	0.177*	0.924*	0.948
a. Lilliefors Significance Correction									

**Table-5 : Multivariate Tests**

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	0.342	6.711 <sup>b</sup>	9.000	116.000	0.000	0.342
	Wilks' Lambda	0.658	6.711 <sup>b</sup>	9.000	116.000	0.000	0.342
	Hotelling's Trace	0.521	6.711 <sup>b</sup>	9.000	116.000	0.000	0.342
	Roy's Largest Root	0.521	6.711 <sup>b</sup>	9.000	116.000	0.000	0.342
D1	Pillai's Trace	0.110	0.500	27.000	354.000	0.984	0.037
	Wilks' Lambda	0.893	0.496	27.000	339.422	0.985	0.037
	Hotelling's Trace	0.116	0.492	27.000	344.000	0.986	0.037
	Roy's Largest Root	0.062	.814 <sup>c</sup>	9.000	118.000	0.604	0.058
D2	Pillai's Trace	0.068	.945 <sup>b</sup>	9.000	116.000	0.489	0.068
	Wilks' Lambda	0.932	.945 <sup>b</sup>	9.000	116.000	0.489	0.068
	Hotelling's Trace	0.073	.945 <sup>b</sup>	9.000	116.000	0.489	0.068
	Roy's Largest Root	0.073	.945 <sup>b</sup>	9.000	116.000	0.489	0.068

D3	Pillai's Trace	0.261	1.248	27.000	354.000	0.187	0.087
	Wilks' Lambda	0.758	1.251	27.000	339.422	0.185	0.088
	Hotelling's Trace	0.295	1.253	27.000	344.000	0.183	0.090
	Roy's Largest Root	0.179	2.345 <sup>c</sup>	9.000	118.000	0.018	0.152
D4	Pillai's Trace	0.155	0.712	27.000	354.000	0.856	0.052
	Wilks' Lambda	0.852	0.707	27.000	339.422	0.861	0.052
	Hotelling's Trace	0.165	0.701	27.000	344.000	0.867	0.052
	Roy's Largest Root	0.077	1.008 <sup>c</sup>	9.000	118.000	0.437	0.071
D5	Pillai's Trace	0.119	0.543	27.000	354.000	0.971	0.040
	Wilks' Lambda	0.884	0.543	27.000	339.422	0.971	0.040
	Hotelling's Trace	0.128	0.544	27.000	344.000	0.971	0.041
	Roy's Largest Root	0.094	1.239 <sup>c</sup>	9.000	118.000	0.278	0.086
D6	Pillai's Trace	0.111	0.760	18.000	234.000	0.745	0.055
	Wilks' Lambda	0.893	.754 <sup>b</sup>	18.000	232.000	0.752	0.055
	Hotelling's Trace	0.117	0.748	18.000	230.000	0.759	0.055
	Roy's Largest Root	0.063	.824 <sup>c</sup>	9.000	117.000	0.595	0.060
D7	Pillai's Trace	0.058	.793 <sup>b</sup>	9.000	116.000	0.623	0.058
	Wilks' Lambda	0.942	.793 <sup>b</sup>	9.000	116.000	0.623	0.058
	Hotelling's Trace	0.062	.793 <sup>b</sup>	9.000	116.000	0.623	0.058
	Roy's Largest Root	0.062	.793 <sup>b</sup>	9.000	116.000	0.623	0.058
PR1	Pillai's Trace	0.038	.516 <sup>b</sup>	9.000	116.000	0.861	0.038
	Wilks' Lambda	0.962	.516 <sup>b</sup>	9.000	116.000	0.861	0.038
	Hotelling's Trace	0.040	.516 <sup>b</sup>	9.000	116.000	0.861	0.038
	Roy's Largest Root	0.040	.516 <sup>b</sup>	9.000	116.000	0.861	0.038
PR2	Pillai's Trace	0.136	2.026 <sup>b</sup>	9.000	116.000	0.042	0.136
	Wilks' Lambda	0.864	2.026 <sup>b</sup>	9.000	116.000	0.042	0.136
	Hotelling's Trace	0.157	2.026 <sup>b</sup>	9.000	116.000	0.042	0.136
	Roy's Largest Root	0.157	2.026 <sup>b</sup>	9.000	116.000	0.042	0.136
<p>a. Design : Intercept + D1 + D2 + D3 + D4 + D5 + D6 + D7 + PR1 + PR2</p> <p>b. Exact statistic</p> <p>c. The statistic is an upper bound on F that yields a lower bound on the significance level.</p>							

Tables-5 present multivariate tests are statistical techniques applied to analyze the relationships between respondents' demographic profiles, perceptions of the profile of social media usage, and visual and auditory perceptions of marketing variables. these tests are useful for examining how multiple demographic and perception profiles of social media usage variables affect visual and auditory perceptions about marketing in social media platforms variable simultaneously and can help researchers identify which demographic variable and perception profile of social media usage variables are most important for predicting or explaining variation in the visual and auditory perception about marketing in social media platforms variables. The multivariate tests, several different methods can be adopted to test between-subject outcomes. The results of the multivariate statistical analysis revealed the educational background of the participants has a notable impact on their visual and auditory perceptions regarding marketing activities on social media platforms, specifically on Telegram, Snapchat, Tumblr, and YouTube. The analysis suggests that individuals with a higher educational qualification may have a more critical and analytical approach toward evaluating marketing content on these social media channels, resulting in a deeper and more thorough understanding of the brand and its offerings. In contrast, individuals with a lower educational qualification may have a more simplistic and straightforward perception of the marketing content, which may limit their ability to fully comprehend the message, conveyed by the brand. Overall, these findings highlight the importance of considering the educational background of the target audience while developing marketing strategies on social media platforms. It emphasizes the need for creating marketing content that is both informative and easy to understand, irrespective of the educational qualification of the audience. Furthermore, the result indicates that the duration of video advertisements viewed on social media platforms, such as Facebook, YouTube, and Instagram, has a considerable impact on both visual and auditory perceptions of branding. The reason for this is that the duration of a video advertisement has a major effect in capturing the attention of the viewer and conveying the intended message effectively. Shorter ads may be more memorable and attention-grabbing, whereas longer ads may provide more information and detail about the brand. Therefore, understanding the impact of video ad length on visual and auditory brand perception is essential for developing effective advertising strategies on social media platforms.

**Table-6 : Measurement Model**

Observed	Estimate	SE	95% Confidence Intervals		$\beta$	z	P
			Lower	Upper			
M_VAPMF	1	0	1	1	0.654		
M_VAPMY	0.894	0.129	0.642	1.15	0.641	6.94	< .001
M_VAPMI	0.899	0.141	0.622	1.18	0.58	6.36	<.001
M_VAPMT	1.176	0.142	0.898	1.45	0.792	8.3	<.001
M_VAPMTL	1.288	0.143	1.007	1.57	0.877	8.99	< .001
M_VAPML	1.275	0.152	0.978	1.57	0.806	8.41	<.001
M_VAPMSC	1.062	0.146	0.776	1.35	0.677	7.28	<.001
M_VAPMTU	1.25	0.145	0.966	1.53	0.832	8.63	<.001
M_VAPMSH	1.201	0.14	0.928	1.47	0.829	8.6	<.001
<b>Model Fit Summary : CFI = 0.979; TLI = 0.973; NFI = 0.977; IFI = 0.979; SRMR = 0.027; RMSEA = 0.022</b>							

In Table-6 the Confirmatory Factor Analysis (CFA) technique can be used to evaluate the measurement model fit of the visual and auditory perceptions about marketing variables on various entertainment or informal platforms, such as Facebook, YouTube, Instagram, Twitter, Telegram, LinkedIn, Snap Chat, Tumblr, and Sharechat. The measurement model for this study would involve selecting variables that are indicative of visual and auditory perceptions of branding on social media. These variables could include factors such as ad duration, color scheme, audio quality, brand recognition, and brand recall. To evaluate the model fit, various statistical indices can be examined. The chi-square goodness-of-fit test is the traditional measure of model fit, with a non-significant value indicating a good fit. However, this test is sensitive to sample size and model complexity. Therefore, additional indices should also be considered as mentioned in Table 6. The goodness of fit for the Visual and Auditory Perception of Marketing variables would be indicated by a non-significant chi-square value, CFI and TLI >0.95, RMSEA <0.06, and SRMR <0.08. It also presents the summary of how well the model, with estimated parameters, fits the data with the help of the comparative fit index (0.979) which is above 0.95, Tucker-Lewis Index (0.973)



above 0.95, root mean square error of approximation (0.022) is good which is lesser than 0.05, the difference between the observed correlation and the model implied correlation matrix (0.027) is acceptable when it value lies between 0 and 0.08, Normed Fit Index (0.977) which is above 0.9 and Incremental fit index (0.979) above 0.90. Overall, the statistical indices suggest that the measurement model for Visual and Auditory Perceptions of Marketing variables on social media platforms is an effective representation of the construct being measured. The variables used to measure the construct are likely to be indicative of visual and auditory perceptions of branding on social media. Therefore, the results of the CFA suggest that the measurement model can be used to accurately assess the construct of visual and auditory perceptions about marketing variables on social media platforms.

## 5. Findings

- From this study, Consumers are aware of social media marketing and their preference to watch advertisements in social platforms is less than 45 seconds.
- Among the selected platforms, users spend more time in Instagram when its falls under the influence of visual and auditory perception.
- Visual and auditory factors with strategies in creation of advertisement such as Fear of Missing Out, reliability, riveting and Users selling proposition plays important role in influencing the users.

## 6. Suggestion

Promoters and marketers are advised to use the best platform to make awareness about their products, where users spend more time. The marketing content should be constrained to 30 seconds as users are spending limited hours using social media. The advertisers are suggested to use the best marketing strategies to attract more customers by Fear of missing out, users selling proposition in knowledge shared, riveting, and reliability. This study suggests that an attention-grabbing advertisement with information plays an important role in attracting more consumers.

## 7. Conclusion

This user perception research was conducted to examine the expectation of the user cum consumer's attitude to social media marketing who abide in Chennai city of Tamil Nadu. The outcome of the study indicates that users are divided into two assertive groups such as active social media users and average in use.

The empiric outcome upholds the visual and auditory marketing variables such as Fear of Missing Out (FOMO), Users Selling Proposition (USP) in knowledge sharing, riveting, reliability, the content of the promotion, and time spent in the attitude of users to make them sensible about the products. Finally, marketers are advised to use the best social media platform with reliability and use short marketing content to attract more customers with minimal cost when compared to traditional marketing.

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# Production and Sales Performance of Cotton Produce in Beed District

SARWADE C.W.

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**Abstract :** *Agricultural provides livelihood to about 70% of the country's population, contributes nearly 50% to the national income. Besides food agriculture is the most important raw material supplied to many industries like cotton, jute, vanaspati and sugar. Similarly, agricultural commodities occupy prime place in India's export trade, contributing 40 to 50% of the total foreign exchange.*

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**Keywords :** xxxxxxxxxxxxxxxxx

## Introduction

Agricultural plays a vital role in Indian economy as it provides employment to 69% of working population. In developing countries, agriculture contributes in a large measure to a countries economy. This role of agriculture arises out of the position, the agrarian section occupies in the overall economy of the country. During the plan period there has been a considerable growth in agriculture, signifying self- sufficiency in same of the agricultural produce. In spite of this remarkable progress the country does not have efficient agricultural marketing system.

Agricultural provides livelihood to about 70% of the country's population, contributes nearly 50% to the national income. Besides food agriculture is the most important raw material supplied to many industries like cotton, jute, vanaspati and sugar. Similarly, agricultural commodities occupy prime place in India's export trade, contributing 40 to 50% of the total foreign exchange.

## Position of Cotton in India

Remarkable decline in cotton sowing as per the latest report of Crop Weather Watch Group, cotton has been sown in 58.08 lakh hectares till July 18 in the country. This area is 11.8 lakh hectares (16.9%) down from that in the corresponding period last year. Sowing has sharply reduced in Maharashtra, Andhra Pradesh, Karnataka, Rajasthan and other states. Moreover, the standing crop in these regions is getting damaged in want of sufficient rainfall.

Traders said the average yield is likely to increase this year as the number of plants per acre is 7900 as against 6500 in the previous year. But the total production in the region is still likely to be limited to 42 lakh to 42.5 lakh bales as against 47 lakh bales of the previous year. In the western parts, cotton production is expected to witness a sharp fall. Sowing has been very low in Maharashtra, especially in Marathwada and Vidarbha. As of July 18, cotton sowing in Maharashtra was down by 9.1 lakh hectares (34.7%). In Gujarat, the largest cotton-producing State in India, sowing has improved smartly during the last week.

In the last decade, cotton acreage in each of the regions has increased by nearly 2 million hectares from 1990 to 1997. Although the acreage in each of the regions grew in the last decade, the changes in yield have been erratic. For example, from 1981 to 1994, growth in the northern and southern region increased at an annual rate of 6.6 and 4.2%, respectively, compared with negative (-0.7%) growth in the central Region. Since then, yields in the northern region have declined significantly from 470 kg/ha in 1992 to an estimated 282 kg/ha in 2002-03.

In India, cotton occupies an area of nearly 7.39 million hectares, with a production of 2.38 million metric tons (2016-17), ranking third in the world. The lint productivity of cotton is 322 kg/ha, which is the lowest and far below that of the world average of 627 kg/ha. During the last fifty years, production of cotton rose from 30 lakh bales (1 bale = 170 kg) in 1950-51 to 140 lakh bales in 2002-03. During the same period the area under cultivation increased by 58.91 lakh hectares to 73.9 lakh hectares. Using the data for the period from 1950-51 to 1999-2000 on area under cultivation, area covered under irrigation and production, decadal per cent compound growth rates (CGRs) are ascertained.

The present arrivals of cotton in Northern zone are around 40,000 bales per day. In the Central zone the cotton arrivals have increased substantially with daily arrivals touching around 75,000 bales in Maharashtra, 55,000 bales in Gujarat and 20,000 bales in Madhya Pradesh. In South zone also, the daily arrivals are

reported to be around 45,000 bales in Andhra Pradesh, 6,000 bales in Karnataka and 2,000 bales in Orissa.

### **Objectives of the Study**

The broad objectives of the present study are as follows.

1. To study the marketing and sales performance of cotton produce in Beed district.
2. To know the overall background and financial position of cotton Growers.
3. To study the government rules and regulations regarding the production and sales/purchasing practices of cotton cash crop.

### **Selection of Samples**

The Beed district is socially and economically backward district in the region. But due to the globalization and new changed government policies have motivated the farmers to grow the different types of cash crops i.e. sugarcane, oilseeds, groundnuts, Soya beans and cotton Agricultural Produce cash crops.

### **Cotton Scenario in Maharashtra**

Maharashtra is the largest cotton growing State in the country. It covers about 34% of total cotton area and contributes 17% of the production. Maharashtra produces approximately 25 lakh bales per year. Main features of cotton cultivation in Maharashtra are as below.

1. About 97% of the cotton crop is cultivated under rain fed condition.
2. The cotton is mostly grown on soils, which are black in color and called as black cotton soil. The black color of the soil is due to presence of titanium oxide.
3. In Maharashtra two species of cotton viz *G. hirsute* and *G. arboretum* are Cultivated; besides hybrids Mostly intrahirsutum hybrids are grown.
4. The cotton crop is grown in the Kharif season and sowing is generally done with onset of Monsoon.
5. The hybrids cotton covers about 73% of cotton area in the State; about 11% area is covered by improved *hirsute* varieties and 16% by *arboretum* cultivars.

## **Agriculture position of Beed district**

The forest area is 0.26 lakh Hectors out of total 10.67 lakh hectores it is only 2.40%. The area that is not suitable for agriculture is 0.43 lakh hectare while the area that can be used for cultivation is 0.62 lakh hec. The actual area under cultivation is 8.81 lakh hec. The area for cattle pastures only 0.36 lakh hectare and is proportional to cow family area is only 0.23 lakh hectare. The per head cultivated land is only 0.41 hectare. Due to irregular and in adequate Mansoon the confusions become more compounded.

As per the agricultural report of 1990-91 there are 4, 05,539 land owners possess 893872 hc. of land, from these having less than 1 hectore are 123486 and they possess only 69913 hectares of land. Those possess land between 1 to 2 hectore are 128670 possessing 188790 Hectore. Those with 2 to 4 hectore. Are 98176 having 271975 Hectore, each is 49833 having 286998 hectore. Those with 10 to 20 hectore. Are 5374 having 76196 Hectore. It is clear that 2, 52,156 are Alph Bhudharak (B.P.L.) and even less than that having only 258703 hectore of land. The proportion between the land owners and landless is 62.18% and their lands are only 28.94%.

## **Data collection and analysis**

The table No. 1.3 highlights on the area, production and productivity of cotton in India during the last six decades. The production of cotton in India, the significant achievement has been made increasing yield and production in the year 2020-21. Development is 322.00 lakh bales of high yield varieties, appropriate transfer of technology, better farm management practices increased area under cultivation of cotton etc.

The table no.1.2 indicates that, the total Production of cotton (quintal) and sale of cotton is shown in bales. The highest Production that is 108.1 quintal is in the Beed Taluka, and a total sale is of 17296 lakh bales. However, they earned profit is of 17%.

The table no. 1.2 highlights on the Production of cotton in Beed taluka in the year 2016-17. This year production is 333.8 quintal. Then sale is of 55077 lakh and the profit margin is 55%. Shirur taluka is the highest in production and sale of cotton.

The table no 1.6 highlights on the irrigation of cotton crop helps for increasing cotton production and sale. It shows the high production of cotton in Wadwani taluka at 184%, Dharur shows low as 8% of the profit margin in Beed district in the year of 2017-18.

The table no. 1.7 highlights on the Production of Cotton in Beed District. That is, 195% is the highest profit margin in Majalgaon taluka. However, 171% of the profit margin is shown in Parli taluka of the cotton production and sale in Beed District. In the year 2019-20 a Majalgaon taluka increasing cotton productivity and sale as compare to other taluka for the production and sales performance.

The table no. 1.7 highlights on the production of cotton in Beed District. It shows total production, total Sale, and percentage of profit margin. In Majalgaon taluka total production of cotton is 1183.1 quintal, total sale is of 195211.5 in bales and out of that profit margin resulting 195% in the year 2019-20. However, lowest production of cotton in Dharur taluka is the 485.5 per quintal, sale 80107.5 in bales and profit margin is 80% in the year of 2019-20.

Study indicates that the Functions of Primary Agriculture Produce Market Committee of Beed District. It shows Sale of Agricultural Produce i.e. Rice, Wheat, Cotton, Oilseeds, and Pulses in Primary Markets in the talukas of Beed District. Cotton Produce shows the highest total selling in Beed taluka is of 2224, out of this cotton is 230 rupees. However, the lowest cotton produces in the Georai taluka is of 88 and total produce is of 854 in the year 2016-17.

The present study also indicates that, the area of land utilization for cotton produces of Beed district. In the year 2016-17 the total area for land utilization were 10686 hectares. It shows, highest utilization in the year 2016-17, 2017-18, is of 174 hectares of land. Then, non- utilized area of land is the highest of 430 hectares and lower non- utilized area of land is of 400 hectares.

## **Conclusion and Suggestions**

1. The study incited that the acreage under cotton was least unstable for all the cotton growing parts in Beed District. It means that the cotton acreage has been most stable in the most prominent cotton growing region of Maharashtra state.
2. In the first holding group of 0-5 acres, there are 8% of the selected 4 farmers. Among the selected 14% of the 7 farmers are holding land of 5-10 acres, 24% are in holding group of 10-15 acres to the 12 farmers, 24% of the 12 farmers are in the next holding group 15-20 acres and 30% of the 15 farmers are holding range between 20-25 acres.
3. The Cotton growers in Beed taluka is the highest, from the total no of rural families (62683) 4300 are engaged in cotton produce. However, 1017 families are engaged only in Wadwani taluka in Beed District.



4. The educational background of the cotton producers in Majalgaon taluka is highest, i.e. illiterate farmers are 42%, primary educated are 30%.
5. The total cropped area such as Cereals, Pulses, Oilseeds, Sugarcane and Cotton in the year 1960-61, 1970-71, 1980-81, 2000-01, 2005-06, 2006-07. Thus, total cropped area of cotton produce shown in the year 1960 to 61 is of 5890, 1970 to 71 is of 490, 1980 to 1981 is of 310 hectares , 1990 to 1991 is of 24 hectares , 2005 to 2006 is of 92 and 2006 to 2007 is of 92 hectares. Further, it indicates total cropped area of Cereal produce is much higher than, Pulses, Oilseeds, Sugarcane, and Cotton Produce in the study period.
6. Cotton Produce shows the highest total sale in the Beed taluka i.e.R.S. 2224 out of this cotton is 230 rupees. However, the lowest cotton produces in the Georai taluka is of 88 and total produces were 854 in the year 2020-21.
7. The Percentage of gross cropped area to net area sown in Beed District for Agricultural Produce i.e. Rice, Jawar, Bajra, Corn, Cereals like, Tur, Mug, Udid, Other Pulses are Groundnut, Till, Soya bean, Karla, Oilseeds, Cotton, Sugarcane, Sunflower. The Rice crop is 50% in between the gross cropped area (2600) to net area (1300). in Beed district.

### **Important Suggestions**

To solve the problems in Cotton marketing and Selling, following important Suggestions made by the researcher.

- 1) To sustain and extend this programme to larger areas of the country, steps were initiated to increase the production of high- yielding varieties of seeds, fertilizers and pesticides within the economy and supplement the domestic production by imports whenever is necessary.
- 2) Another important measure initiated is the expansion of institutional credit to farmers, especially through co-operatives and commercial banks.
- 5) The Government has provided massive subsidies to farmers on agricultural inputs like irrigation, fertilizers and power. The object of input subsidization is to increase Agricultural Production and Productivity by encouraging the use of modern inputs in agriculture.
- 6) In a bid to provide food grains and other essential goods to consumers at cheap and subsidized rates, the Government of India has built up a borate food security system in the form of Public Distribution System (PDS) during period.

- 7) All the farmers must get the up to date knowledge regarding the prices of the Cotton. So, the Government has to start new agriculture net centers to the farmers to get the up to date agricultural knowledge and prices.
- 8) The Market Committee has to pay immediate cash payment against the produce sold in the Market Committee and there should be minimum tax and other taxes.
- 9) To store the agricultural produce the market committee has to provide good and safety warehouses to the farmers as well as traders.
- 10) All computerized billing must be made for the need and use of farmers to get transference in the daily Market Committee works.

### Overall Observations

For an Agriculturist main source of income is Sale of Agricultural Produce. It has been observed that, on an average farmer sale the goods the Rupees will not completed their needs and wants. The amount that he receives would depend upon price at which he sold his produce. The large size of the class of agricultural labors are one of the another features to be noted in the livelihood pattern of the region. This could be partly explained by a relatively larger size of land holdings. Apart from the population directly dependent on agriculture, the other warning population in the rural areas is more or less an adjunct to the agricultural population. It indicates that the more important factor for heavy dependence of labors on agricultural employment, in the non- agricultural sector due to the general lack of secondary activity in the Region.

**Table No.1.1 : Cotton Growers, Traders and Overall Market Committees at a Glance**

Sr.No.	Year	No. of Cotton Producers	No. of Cotton Mills	No. of Traders	No. of Middle men	Overall customers
1	2016-17	3450	3	3000	2	3000
2	2017-18	10500	16	12000	3	12000
3	2018-19	11250	15	2	4	2
4	2019-20	12000	14	13000	2	13000
5	2020-21	12500	12	10000	3	10000

Sources : Compiled from Annual Reports of the Market Committee (2016-17 to 2020-21)

**Table No. 1.2 : Production of Cotton in Beed District**

Sr.No.	Taluka	Total Production (in quintal)	Total Sales (in bales)	Profit Margin (%)
1	Beed	108.1	17296	17%
2	Patoda	211.1	33776	34%
3	Shirur(Kasar)	324.1	51856	52%
4	Ashti	99.3	15888	16%
5	Georai	118.6	18976	19%
6	Majalgaon	231.0	36960	37%
7	Ambajogai	170.6	27296	27%
8	Kaij	119.7	19152	19%
9	Parli	151.2	24192	24%
10	Dharur	33.7	5392	54%
11	Wadwani	128.9	20624	21%

Source : District Supervisor Agricultural Office, Beed (2020-21)

**Table No. 1.3 : Production of Cotton in Beed District**

Sr.No.	Taluka	Total Production (in quintal)	Total Sales (in bales)	Profit Margin (%)
1	Beed	333.8	55077	55%
2	Patoda	193.1	31861.5	32%
3	Shirur (Kasar)	841.3	138814.5	139%
4	Ashti	462.5	76312.5	76%
5	Georai	317.9	52453.5	52%
6	Majalgaon	421.1	69481.5	69%
7	Ambajogai	402.0	66330	66%
8	Kaij	206.3	34039.5	34%
9	Parli	634.1	104626.5	104%
10	Dharur	220.5	36382.5	36%
11	Wadwani	244.1	40276.5	40%

Source : District Supervisor Agricultural Office, Beed (2020-21)

**Table No.1.4 : Production of Cotton in Beed District**

Sr.No.	Taluka	Total Production (in quintal)	Total Sales (in bales)	Profit Margin (%)
1	Beed	645.5	103280	103%
2	Patoda	233.1	37296	37%
3	Shirur (Kasar)	925.7	148112	148%
4	Ashti	418.8	67008	67%
5	Georai	815.2	130432	136%
6	Majalgaon	915.4	146464	146%
7	Ambajogai	543.1	86896	86%
8	Kaij	285.8	45728	45%
9	Parli	397.4	63584	63%
10	Dharur	54.0	8640	8%
11	Wadwani	1155.8	184928	184%

Source : District Supervisor Agricultural Office, Beed (2020-21)

**Table No. 1.5 : Production of cotton in Beed District**

Sr.No.	Taluka	Total Production (in quintal)	Total Sales (in bales)	Profit Margin (%)
1	Beed	608.7	100435.5	100%
2	Patoda	990.7	163465.5	163%
3	Shirur(Kasar)	987.2	162888	162%
4	Ashti	255.0	42075	42%
5	Georai	701.3	115714.5	115%
6	Majalgaon	1024.6	169059	169%
7	Ambajogai	0.0	0	0%
8	Kaij	481.8	79497	79%
9	Parli	324.9	53608.5	53%
10	Dharur	542.5	89512.5	89%
11	Wadwani	529.0	87285	87%

Source : District Supervisor Agricultural Office, Beed (2020-21)

**Table No.1.6 : Production of cotton in Beed District**

Sr.No.	Taluka	Total Production (in quintal)	Total Sales (in bales)	Profit Margin (%)
1	Beed	891.0	151470	151%
2	Patoda	683.8	116246	116%
3	Shirur(Kasar)	834.0	141780	141%
4	Ashti	707.5	120275	120%
5	Georai	732.1	124457	124%
6	Majalgaon	1342.3	228191	228%
7	Ambajogai	774.9	131733	131%
8	Kaij	526.4	89488	89%
9	Parli	431.1	73287	73%
10	Dharur	753.8	128146	128%
11	Wadwani	1081.9	183923	184%

Source : District Supervisor Agricultural Office, Beed (2020-21)

**Table No. 1.7 : Production of Cotton in Beed District**

Sr.No.	Taluka	Total Production (in quintal)	Total Sales (in bales)	Profit Margin (%)
1	Beed	857.4	141471	141%
2	Patoda	625.1	103141.5	103%
3	Shirur(Kasar)	916.5	151222.5	151%
4	Ashti	980.2	161733	161%
5	Georai	900.0	148500	148%
6	Majalgaon	1183.1	195211.5	195%
7	Ambajogai	903.3	149044.5	149%
8	Kaij	973.6	160644	161%
9	Parli	1038.8	171402	171%
10	Dharur	485.5	80107.5	80%
11	Wadwani	947.2	156288	156%

Source : District Supervisor Agricultural Office, Beed (2020-21)

**Table No. 1.8 : Cotton Growers in Beed District at a Glance**

Sr. No.	Talukas	Total Rural Families	Total Cotton Growers
1	Ashti	50704	1786
2	Patoda	24550	2344
3	Shirur (Kasar)	25133	336
4	Georai	56863	76050
5	Majalgaon	40255	1545
6	Wadwani	17166	1017
7	Beed	62683	4300
8	Kaij	48671	2584
9	Dharur	20242	1439
10	Parli	33148	1411
11	Ambajogai	35705	1225
	Total	4,15,120	25037

Source : District Statistical Office, Beed (2020-21)

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# The Effect of Website Dimensions of National Parks on Tourist Satisfaction

MUKESH SAHA AND DEBASIS BHATTACHARYA

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**Abstract :** *Tourist satisfaction is the primary concern of any national park. This study explored the website dimensions of national parks and examined their effects on tourist satisfaction. For this, the study collected data from tourists who used the national park's website to visit the national park in West Bengal, India. A total of 217 samples have been collected using snowball sampling, and multiple regression analysis has been used to examine the effect of national park website dimensions on tourist satisfaction. The study findings revealed that national park website attributes, such as website design (WD), navigation (NAV), reliability (REL) and information quality (IQ), affect tourist satisfaction (TS). The study found that the navigation dimension of the national park website has a more substantial influence on tourist satisfaction (due to the highest beta coefficient  $\beta = 0.271$ ) than the other dimensions of the national park website. Next, the effects of national park website dimensions such as "reliability", "website design," and "information quality respective beta coefficients of 0.165, 0.094, and -0.113 on tourist satisfaction are also found to be significant.*

*The findings of this study will help national park operators to know the various dimensions of a national park website. Moreover, the study's results will allow them to strategically focus on the relative importance of national park website dimensions to satisfy tourists.*

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**Keywords :** Website Design, Navigation, Reliability, Information Quality, Tourist Satisfaction.

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## **1. Introduction**

In the era of technology and digitisation, everyone is becoming directly or indirectly dependent on the internet. With the help of broadband, any message can be sent anywhere quickly, and any necessary information can be obtained within a few seconds. This is why business houses, educational institutions, government etc. are taking the help of internet to make their work smooth.

National parks are also attracted and influenced by the beneficial features of the Internet. Therefore, the operators of national parks started developing their respective national park websites. The national park website will benefit tourists and the national park operator simultaneously. Tourists will get reliable information about the national park, will be able to book slots for their visit and will pay the requisite entry fee. On the other hand, the national park operators enjoy massive reach and popularity among tourists, which helps in increasing the frequency of tourist visits to the national parks.

However, tourist satisfaction is becoming increasingly challenging for national park operators. Past literature suggest that customer expectations are increasing daily in tourism, banking and other financial sectors. Aminu (2012) noted that customers are looking for more functional benefits in industries such as tourism, banking or other economic sectors; hence, customer satisfaction is becoming the priority of these industries. Keeping in mind the sense of customer satisfaction, this study examines the contribution of national parks websites to tourist satisfaction. For this, the study will explore various dimensions of the national park website and examine their impact on tourists' satisfaction.

## **2. Reviews of Literature and Development of Hypothesis**

The study explores the previous literature to find out the various dimensions of the national park website. The important dimensions of National Park websites are given below :

### **2.1. Website Design (WD)**

The website is an intermediary between the national park operator and tourists. The interface of the National Park website should be attractive, visually appealing and accessible. In other words, the website of the National Park should be designed in a structured manner. A well-organized National Park website provides easy navigation for tourists to view photos of National Parks and book slots. According to Luo et al. (2012), a user-friendly website design helps users find desired information quickly, makes them happy, and increases their

satisfaction. The studies by Liu et al. (2008), Alam & Yasin (2010), Karim (2011), Kassim & Abdullah (2010), and Chen et al. (2012) advocated a positive relationship between customer satisfaction and website design. The study by Sakhaei et al. (2014) and Ling et al. (2016) suggested that website design positively affects customer satisfaction in Internet banking. Thus, previous literature has advocated positive the impact of website design on customer satisfaction. Therefore, the study hypothesizes that:

**H1a : The website design of a national park positively affects tourist satisfaction.**

## **2.2. Website Navigation (NAV)**

Website navigation helps tourist to access the entire webpage of a national park website. Smooth navigation of a national park website allows tourist to access the home page of the concerned national park website, hyperlink of the national park photo gallery, and payment option menu. The study by Bell & Tang (1998), Cox & Dale (2002), Huizingh (2000), Muylle et al. (2004), Ranganathan & Ganapathy (2002), Rocha (2003), Rosen & Purinton, (2004), Teo & Pian (2003), and Wan (2002) suggested that smooth navigation of the website enhances the user satisfaction. Therefore, the study hypothesises that:

**H2a : The website navigation of a national park positively affects tourist satisfaction.**

## **2.3. Website Reliability (REL)**

Reliability is the ability of a business to deliver the promised service consistently. If the company provides the services to the consumer as promised, the consumer becomes happy, and the business's reliability in terms of service delivery increases. According to Zaim et al. (2010), credibility is one of the key elements in achieving customer happiness. According to Sakhaei et al. (2014) and Ma (2012), reliability directly affects customer satisfaction in the online banking industry. Studies by Gunarathne (2014), Hossain (2012), Minh et al. (2015), Rao & Sahu (2013), and Tuan & Linh (2014) found a positive relationship between reliability and customer satisfaction in the hotel industry. Similarly, studies by Alam & Yasin (2010), Swaid & Wigand (2007), Karim (2011), and Omar et al. (2015) found a favorable relationship between reliability and customer satisfaction, especially in online shopping. Dreheeb et al. (2016) advocated that user satisfaction using an e-learning system is highly correlated with the reliability of a website. Siddiqi (2011) studied the banking sector and found a favorable relationship between website credibility and customer satisfaction.

Therefore, the study hypothesises that :

**H3a : The website reliability of a national park positively affects tourist satisfaction.**

## **2.4. Information Quality (IQ)**

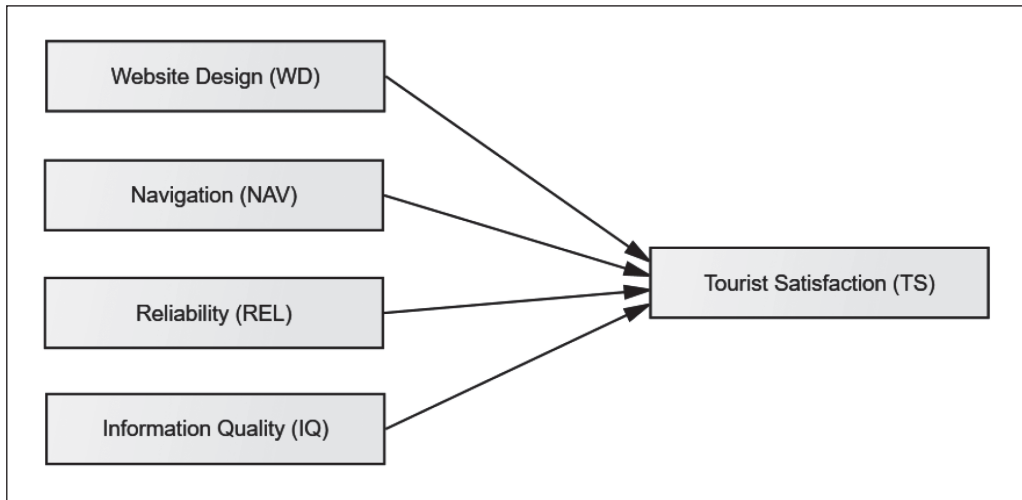
The quality and amount of information and graphics influence users' opinions about a destination and help them plan their travels (Kaplanidou & Vogt, 2006). Choi et al. (2007), Das & Utkarsh (2014), and Smith & Ze (2011) suggested that the satisfaction and retention of users on a particular website can be maintained with the help of website quality which includes accuracy, consistency, timeliness, completeness, conciseness, reliability and comprehensibility. Similarly, Das & Utkarsh (2014), Kaplanidou & Vogt (2006), and Romanazzi et al. (2011), suggested that detailed location information for depicting the beauty and attracting the traveler may be provided in the form of audio-visual materials like images, videos, and wallpapers. Similarly, national park website information quality is determined by the quality and amount of accurate information (Cuahtémoc Luna-Nevarez & Hyman, 2012), current information (Giannopoulos & Mavragani, 2011), detailed information (destination/product introduction, history, location and features of products), and ancillary services (e.g., accommodation, transportation, guide service, and restaurants)(Baggio, 2003). Therefore, the study hypothesises that :

**H4a : The website information quality of a national park positively affects tourist satisfaction.**

## **3. Proposed Research Model**

The study delved deeper into previous research on tourist satisfaction. Previous research suggests that several dimensions of a national park website can affect tourist satisfaction. However, with the help of prior literature, the study identified website attributes of national parks, such as website design, navigability, reliability and information quality, that affect tourist satisfaction. Based on the factors of the national park website, the study develops the following proposed model to assess tourist satisfaction.

The proposed research model (see Figure-1) shows that website factors of a national park, such as website design (WD), navigation (NAV), reliability (REL) and information quality (IQ), affect tourist satisfaction (TS).

**Figure-1 : Proposed Research Model**

#### **4. Measurement and Development of Questionnaire**

A structured questionnaire has been developed with the help of pre-established questions to measure the dimensions of the national park website. The national park dimension, tourist satisfaction, is measured by five items adopted from Oliver's (1981) study. The study adopts

four items from Satghare & Sawant's (2019) study to assess the quality of information. To measure navigation, four items are taken from Akama & Kieti (2003). Similarly, three items have been adopted from Wang & Tang's (2003) study to measure the reliability of website dimensions of national parks. The study measures the website design dimension of a national park with the help of three items taken from a study by Wilson & Christella (2019).

Therefore, the study adopted a total of 19 questions from previous studies to measure national park website dimensions, such as website design (WD), navigation (NAV), reliability (REL), information quality (IQ), and tourist satisfaction (TS).

The study uses a five-point Likert scale to measure the items/questions of various online shopping parameters. In this five-point Likert scale, five represents "strongly agree", four represents "agree", three represents "undecided/neutral", two represents "disagree", and one represents "strongly disagree".

## 5. Collection of Data

Data is collected from tourists visiting national parks in West Bengal, India, using a structured questionnaire. The data was collected between August 2021 and April 2022. The study used the snowball sampling technique to obtain responses from tourists. Three hundred questionnaires were distributed among the tourists visiting National Park in West Bengal, India. Out of these, 258 question papers were received. However, the study had to exclude 41 questionnaires from the data analysis because they were incomplete. Therefore, 217 questionnaires were used in the study to analyse the data and interpret its results.

## 6. Testing of Reliability of Data

The study took the help of Cronbach's alpha value to examine the internal consistency in the scale items of a dimension. According to George and Mallery (2003), Cronbach's alpha score of 0.7 is satisfactory. Table-1 shows the national parks' website dimensions and their respective calculated Cronbach alphas ( $\alpha$ ) values.

**Table-1 : Cronbach Alpha Value**

National Park Website Dimension	Nos. of Items	CronbachAlpha Value ( $\alpha$ )
Website Design (WD)	03	0.77
Navigation (NAV)	04	0.70
Reliability (REL)	03	0.82
Information Quality (IQ)	04	0.91
Tourist Satisfaction (TS)	05	0.88

*Source : Calculated using primary data.*

The calculated Cronbach alpha ( $\alpha$ ) values ranged from 0.70 to 0.91 (see Table-1), which is within the prescribed acceptance limits. Therefore, a scale of website attributes of national parks, namely website design (WD), navigation (NAV), reliability (REL), information quality (IQ), and tourist satisfaction (TS), has been established.

## 7. Testing of Data Normality

The study uses descriptive statistics such as mean, standard deviation, skewness and kurtosis to establish the normality of the data for the dependent variable, tourist satisfaction. Table-2 indicates the calculated value of the descriptive statistics of the dependent variable, namely tourist satisfaction.

**Table-2 : Descriptive Statistics**

Items	N	Mean	Std. Deviation	Skewness	Overall Skewness	Kurtosis	Overall Kurtosis
TS1	217	4.09	.877	-.804	-.973	.226	.952
TS2		4.08	.924	-.876		.477	
TS3		3.88	.893	-.481		-.107	
TS4		3.83	.735	-.356		.446	
TS5		3.87	.823	-.862		.795	

Source : Calculated using primary data.

However, this study uses other descriptive statistical tools, such as skewness and kurtosis, to validate the normality of the data. According to Kline (2011), the issue of normality arises when the absolute values of kurtosis and skewness exceed three and ten, respectively. Since the calculated values of skewness and kurtosis fall within the accepted limits of the data's normality, the data's normality for the dependent variable (here, tourist satisfaction) is established.

## 8. Testing of Multicollinearity in Data

The study examines multicollinearity in the data with the help of two statistical tests : tolerance test and variance inflation factor (VIF).

**Table-3 : Testing of Multicollinearity**

Variables	Collinearity Statistics	
	Tolerance	VIF
Website Design (WD)	0.797	1.255
Navigation (NAV)	0.870	1.149
Reliability (REL)	0.856	1.168
Information Quality (IQ)	0.962	1.040

Source : Calculated using primary data.

According to Midi et al. (2010), when the tolerance value is less than 0.20 or 0.10 and/or the VIF of 5 or 10 and above, a multicollinearity problem emerges. Table 3 indicates that the calculated values of tolerance and VIF are within the specified limits. Therefore, multicollinearity is not a concern for the data used in this study.

### 9. Testing of Autocorrelation in Data

In this study, the Durbin–Watson statistical test is used to test the autocorrelation of the residuals of the regression analysis. Durbin–Watson statistical test values lie between 0 and 4. Numbers closer to 0 or 4 indicate more substantial positive or negative autocorrelation in the residuals. Eydurán et al. (2005) suggested that values close to two are considered to have low autocorrelation. The calculated Durbin-Watson statistic test result, which is 1.812, is within the prescribed limit. This indicates that the autocorrelation problem does not exist in the research data.

### 10. Testing of Hypothesis

The study used multiple regression analysis to assess how website design, navigation, reliability and information quality affect tourist satisfaction (see Table-4).

**Table-4 : Multiple Regression Analysis Outcomes**

Hypo-thesis	Regression Weights	Beta Coefficient	R <sup>2</sup>	F	t-value	p-value	Remarks
H1a	WD → TS	0.094	0.40	35.327	6.343	0.000***	Supported
H2a	NAV → TS	0.271			4.632	0.000***	Supported
H3a	REL → TS	0.165			3.649	0.000***	Supported
H4a	IQ → TS	-0.113			-3.536	0.000***	Supported

Source : Calculated using primary data.

Based on Table 4, the regression equation for estimating tourist satisfaction by website features of a national park can be formulated as follows:

$$Y = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \beta_3 * X_3 + \beta_4 * X_4$$

Or,

$$Y = \beta_0 + 0.094*(WD) + 0.271*(NAV) + 0.165*(REL) - 0.113*(IQ)$$

Were,

Y= Tourists Satisfaction (TS) by National Park Website Attributes.

And,

$\beta_0$ ,  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  and  $\beta_4$  are the beta coefficient in multiple regression analysis.

The study used statistical tools, such as multiple regression analysis, to assess how satisfied visitors were with the website features of the national park. The results of multiple regression analysis revealed the following aspects :

- a. The Website Design (WD) of the national park website significantly predicts tourist satisfaction (TS),  $F(4, 212) = 35.327$ ,  $p < 0.001$ , which indicates that the Website Design of the national park website plays a significant role in shaping tourist satisfaction ( $\beta = 0.094$ ,  $p < 0.001$ ) (see Table-4).
- b. The Navigation (NAV) attributes of the national park website significantly predict tourist satisfaction (TS),  $F(4, 212) = 35.327$ ,  $p < 0.001$ , which indicates that the Navigation features of the national park website play a significant role in shaping tourist satisfaction ( $\beta = 0.271$ ,  $p < 0.001$ ) (see Table-4).
- c. The Reliability (REL) dimension of the national park websitesignificantly predicts tourist satisfaction (TS),  $F(4, 212) = 35.327$ ,  $p < 0.001$ , which indicates that reliability attributes of the national park website play a significant role in shaping tourist satisfaction ( $\beta = 0.165$ ,  $p < 0.001$ ) (see Table-4).
- d. The Information Quality (IQ) provided by the national park website significantly predicts tourist satisfaction (TS),  $F(4, 212) = 35.327$ ,  $p < 0.001$ , which indicates that the Information Quality provided by the national park website play a significant role in shaping tourist satisfaction ( $\beta = -0.113$ ,  $p < 0.001$ ) (see Table-4).

Furthermore, the proposed model generates an  $R^2$  value of 0.40 for estimating the effects of website characteristics of national parks on tourist satisfaction. In other words, it indicates that the proposed model for evaluating tourist satisfaction with the help of website features of national parks explains 40 per cent of the variation in tourist satisfaction.

## **11. Major Research Findings**

This study investigated how tourist satisfaction can be achieved with the help of website features of a national park. After employing multiple regression analysis, the statistical results of the study revealed the following research findings :



- a) The study's findings suggest that national park website characteristics, such as website design, navigation, reliability and information quality, play a significant role in tourist satisfaction.
- b) According to the study's findings, navigation, one of the website features of national park websites, plays a significant role in tourist satisfaction (due to the highest regression beta coefficient compared to other components of national park websites). This indicates that the navigation features of the National Park website should be enhanced to promote tourist satisfaction.
- c) The study's findings suggest that website characteristics of national parks, such as website design, information quality and reliability, also affect visitor satisfaction. In other words, the national park manager should provide an attractive website design, adequate information about the national park, and a reliable website interface to enhance visitor satisfaction.
- d) The study suggests managers and national park website developers to develop a tourist-friendly website and provide easy navigation features. These features of the National Park website enable the tourists to know more about the National Park website, which ultimately increases satisfaction of the tourists.

## **12. Limitations of Research**

The study explored the dimensions of a national park's website and examined their effects on visitor satisfaction. However, the study has the following limitations :

- a) Due to a lack of time and funds, the study only took responses from tourists visiting the national park in West Bengal. In other words, the geographical area of the researcher was limited only to the national parks in West Bengal. Therefore, the research could be expanded to include other national park visitors.
- b) The study included website characteristics of national parks, such as navigation, website design, information quality and reliability, that affect visitor satisfaction. However, there can be other website characteristics apart from these that can affect visitor satisfaction. Therefore, this study could be expanded by including other website features of national parks and examining their effects on tourist satisfaction.

### **13. Conclusion**

Visitor satisfaction is the top priority of any national park manager. Many factors can affect national park visitor satisfaction. However, this study examines the website features of national parks and their effects on visitor satisfaction. The study's findings revealed that website dimensions of national parks, such as navigation, website design, information quality and reliability, affect visitor satisfaction. Therefore, the website of National Parks should be developed with information, smooth navigation features, attractive home pages, and tourist-friendly. These features of a national park website will help tourists in exploring more information about the national park, ultimately leading to tourist satisfaction.

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