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Impact of Crude Oil Prices, FIIs and Exchange Rates on Volatile Indian Stock Market during Lockdown Period of COVID-19

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ABSTRACT

This study observes the volatility of Indian stock market and the impact of crude oil prices, FIIs, and exchange rates on the Indian stock market during continuing coronavirus. This study is based on daily time series data for the period from 31st January, 2020 to 29th May, 2020. While analysing the data, correlation analysis, ADF unit root test, ARCH, and GARCH model and ARDL cointegration test have been used. Both ARCH and GARCH test results show that the Indian stock market is volatile. ARDL bound test result shows that there is cointegration among the variables in the long-run and short-run and if the system is disturbed, a speed of 31 percent will be adjusted towards short-run stability.

Key words: Sensex, Crude oil price, FIIs, Exchange rates, GARCH model, ARDL bound test, Coronavirus

I. INTRODUCTION

Capital markets across the globe tanked unhappily due to the coronavirus declared as a pandemic. In the present condition, the stock market goes down in the world markets and Indian stock market is also going down mainly owing to the panic of the unfamiliar virus. Both economic growth and earnings growth in India are in a long-lasting silence stage because of travel disallows, trade disasters, lockdowns, and other controls (Kulkarni, March 19, 2020).

The stock market survives to give fundraising and trading for businesses and investors, which is to express money into regions of business exercises that the investment society trusts to be the most hopeful for growth and returns. By itself, the stock market purposes to deal out assets, make economic development, give liquidity, help savings and investments, and recommend an economic indicator for the strength of the real economy.

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From the perspective of the coronavirus-persuaded market anxiety, does the market volatility represent that the companies' fundamental financial states unexpectedly changed, or are there other issues coming into play? The response appears mixed. Earnings estimates and other indicators nourishing into evaluation estimates unquestionably have changed. The coronavirus pandemic directly decreased economic activities in assured industries and indirectly shrink the companies' viewpoint through macroeconomic indicators (say, increases unemployment and inflation rates, decreases expenditure, decreases interest rates, decreases crude oil price, rupee depreciates, reduces foreign investment, increases economic uncertainty, and the risk of extensive bankruptcies), additionally holding back the stock price (Su, April 3, 2020).

International crude oil prices are falling day by day and lower crude prices have a positive shock on current account deficit as well as inflation rates in India but the concurrent shock of coronavirus changes the scenery. At the same time, economic activity is slowing down due to travel prohibits; lockdowns, etc. This concern is vital in the minds of investors because the shock of a long-standing hold up will be far bigger than the advantage for India from lower oil prices (Pengonda, March 16, 2020). But India is likely to save about 45 billion US dollars on oil imports in the next year (Tiwari, March 24, 2020). Reserve Bank of India on March 12, 2020 declared a 2 billion US dollar injection into the foreign-exchange market to maintain the rupee. According to the normal economic theory, it can be said that depreciation in home currency causes a decline in stock prices because of expectations of inflation. On average, export-oriented companies are adversely affected by a stronger domestic currency while import-oriented firms benefit from it. At the micro-level, changes in the exchange rate influence the value of a domestic portfolio as well as the value of a portfolio of multinational firms. It is predicted that there is a negative relationship between the strength of the home currency and the aggregate stock prices index (Agrawal *et al.*, 2010; Malarvizhi and Jaya, 2012; Bhunia, 2013; Singh, 2015). The basic economic theory also states that an increase in the price of crude oil leads to an increase in transportation as well as production costs which have also an adverse effect on any countries economy. So, it is quite clear that rising in the price of fuel also helps to raise inflation and reduce consumers' flexible expenditure. Consequently, the financial risk of investments increases due to the wide variation in oil prices. Therefore, for any oil-importing countries like India, raise in oil price will definitely lead to an increase in different inputs of cost and therefore to diminish potential cash flow, and foremost a negative impact on the stock market (Jones and Kaul, 1996; Lake and Katrakilidis, 2009; Fatima and Bashir, 2012; Lis *et al.*, 2012; Sharma and Khanna, 2012).

Between January and March 27, 2020, the net outflows of equity and debt markets are Rs 85,558 crore in India on account of uncertainty over coronavirus. As a result, the Indian rupee is somewhat susceptible (decreases to Rs. 76.15 from Rs. 70) against the US dollar. At the same time, the Indian government has committed Rs. 1.7 lakh crore to protect the Indian economy (Adhikari, March 23, 2020). In India, Foreign Institutional Investors are allowed to invest in any investment areas which are covered either in the form of equity or debt on a daily basis. Thus, it makes an impact on the rise or fall of the Indian stock market. It has been observed in the earlier research work that the Indian stock market

increases when there are positive inflows of FIIs and decreases when there are negative inflows of FII (Goudarzi and Ramanarayanan, 2011; Mohanamani and Sivagnanasithi, 2012; Walia *et al.*, 2012; Juneja, 2013; Shrivastav, 2013).

Earlier the world economy observed different pandemic and epidemic like a plague, Spanish flu, SARS, MERS, Avian flu, Dengu, Swine flu, Cholera, Ebola, Zika, etc. (Cambre, February 24, 2020 and Nathan, March, 16, 2020) when the stock market and economic growth was going down. Numerous researches were conducted to find out the impact of different pandemic into the stock market activity as well as the economic condition of such select countries. But the volatility of the Indian stock market and the impact of changes in FII, exchange rate and crude oil prices on the Indian stock market are hardly available during any epidemic or pandemic period. This research work has been categorised in the following four segments; where the first two segments are completely dealt with the literature review and the data and methodology of the study. The third segment is the analysis of empirical results and the final segment is on the conclusion of the research work.

II. LITERATURE REVIEW

Currently, the new coronavirus epidemic is in progress; therefore, a wide-ranging study of its shock on the stock market is urgently required to identify which factors are responsible for fluctuating stock prices in the epidemic or pandemic period. Earlier researches on stock market volatility and the impact of macroeconomic factors on the stock market have been mainly empirical analyses on the epidemic period. Lots of empirical studies spotlighted on groups of countries whereas some studied a single country. A brief literature review has been presented below.

Chen *et al.* (2003) investigated the positive and negative shocks of the SARS epidemic using event study methodology for the period from 25th September, 2002 to 21st May, 2003. They confirmed that the value effect of the SARS epidemic appeared asymmetrical and the SARS epidemic had negative shocks on Asian as well as on global stock markets. Nippani and Washer (2004) observed the impact of the SARS outbreak on the global stock markets. They concluded that SARS had no negative impact on the influenced countries' stock markets except China and Vietnam. Hooper (2020) assessed and compared the economic market shock of the Wuhan Coronavirus and the past SARS 2003 epidemics. He suggested that the financial markets may be influenced by the growth concerns in China, overall Asia, and possibly even internationally. The financial markets will be more affected through the coronavirus rather than the past outbreaks. Baker *et al.* (2020) examined the stock market volatility affect among bird flu (1997-98), SARS (2003), Swine flu (2009), Ebola and MERS (2014-15), and the Covid-19 (December 2019 to March 2020). They demonstrated that the stock market shock of the COVID-19 pandemic is more temporally focused and more prone to generate daily stock market jumps as well as high stock market volatility than Spanish Flu growths a century before. They advised that the policy response to the COVID-19 pandemic gives the most convincing description for its exceptional shock on the stock market. McKibbin and Fernando (2020) observed the shocks of unlike situations on macroeconomic effects and financial markets in a worldwide

mix DSGE/CGE general equilibrium model. The results demonstrated that a contained epidemic could significantly shock the worldwide economy and the financial markets in the short-run. Zakrajšek (2020) compared the Covid-19 and SARS outbreaks on different economies during the lens of equity investors. The contrast of the particular country-specific returns during pandemics wherein the Covid-19 and SARS outbreaks outspread can give a cleaner opinion of the comparative consequences from the two epidemics across countries and time, as minimum as observed by equity investors. Liu et al. (2020) assessed the short-run shock of the coronavirus epidemic on 21 leading stock market indices in main affected countries using event study methodology and panel data methodology. Event study results showed that the stock markets in the main affected countries cut down rapidly after the virus epidemic. Asian countries experienced more negative abnormal returns as contrasted to other countries. Again, panel data regressions furthermore hold up the unfavourable result of the COVID-19 authenticated cases on stock price indices abnormal returns in the course of a useful way by reckoning investors' negative feelings on future returns as well as panics of uncertainties. Tiberiu and Albulescu (2020) examined the relationship among financial markets volatility, economic uncertainty, coronavirus dynamics, and crude oil price based on time series data between January 21, 2020 and March 09, 2020 with 49 observations using error correction model. The results indicated that the pandemic infectious disease had a minor negative shock on the crude oil prices in the long-run. However, by intensifying the volatility of financial markets, coronavirus had an indirect effect on the current vibrant of crude oil prices. Ozili and Arun (2020) observed the influence of social distancing policies on economic activities and stock market index based on the data from March 23, 2020 to April 23, 2020 considering stock markets of four continents (USA, Europe, Africa, and Asia). They confirmed that the monetary policy decisions, an increasing number of lockdown period, and global travel restrictions harshly influenced the level of economic activities and the major stock market indices. On the contrary, the forced limit on internal movement and higher fiscal policy expenditure had a positive influence on the level of economic activities and the major stock price indices, while the increasing number of coronavirus cases did not have a significant upshot on the level of economic activities.

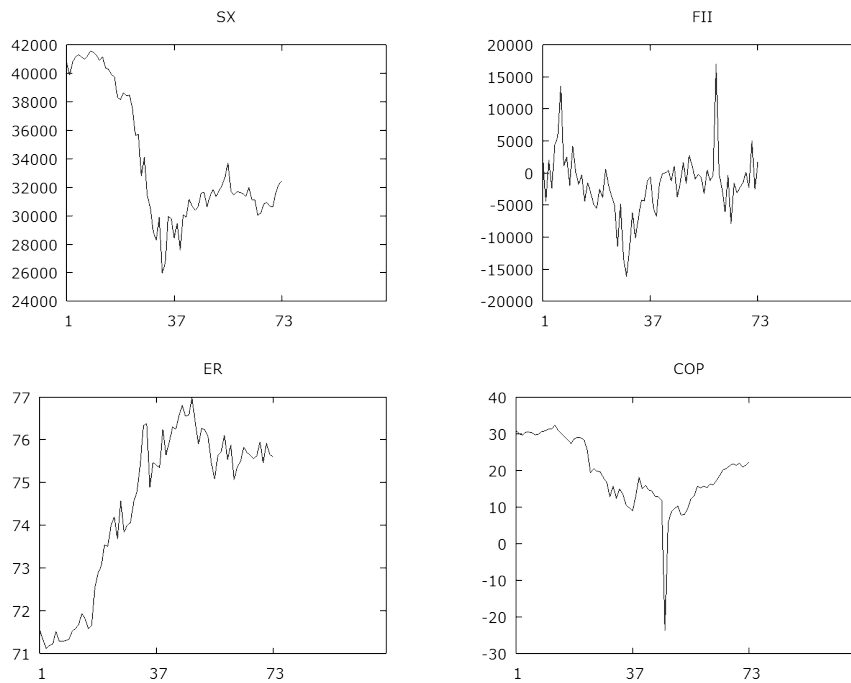
As a whole, the literature shows that coronavirus pandemic and social distancing policy negatively affect the business including export and import, affect the foreign investments and exchange rates, ultimately hit the stock markets and at the same time, coronavirus indirectly influences the crude oil prices and hits the stock markets, irrespective of the geographical closeness. Drawing on this, we examine the stock market volatility in India and the impact of crude oil price, foreign institutional investment, and exchange rates on the Indian stock market.

III. DATA AND METHODOLOGY

The daily time series data are collected from the yahoo.finance database, investing.com database and RBI database to conduct this study. The period from 31st January, 2020 to May 29, 2020 has been considered due to the situation of coronavirus and its impact on world trade, the world economy, and financial markets. The starting date 31st January, 2020 has been considered as the first

case of Covid-19 was detected in India and the last date 29th May has been considered because the strict lockdown 4.0 periods has been completed on May 31, 2020 but May 30 & 31, 2020 is not considered under the study as the market is closed on account of Saturday and Sunday. Since Foreign Institutional Investment (FII), the exchange rate (ER) and crude oil prices (COP) are affected too much due to coronavirus shock, we have used those variables as an independent variable and at the same time, Sensex (SX) in the Indian stock market has been decreased notably, especially in March 2020, we have considered Sensex as dependent variable. Initially, all the variables except FII are transformed into a natural logarithm as it reduces the chance of heteroskedasticity in the model. But the transformation of FII into a natural logarithm is not possible as the data set is negative.

FIGURE. 1

Time series Plot

The selected variables have been presented in the time series plot (Figure 1) for the period from 31st January, 2020 to May 29, 2020 whether we can develop a model to know the exact conditions of the selected variables. The diagram shows that FII has fluctuated more under the study period, the exchange rate has been fluctuated more in the lockdown period, crude oil prices have been decreased due to low demand around the globe and Sensex has also fluctuated during the lockdown period.

To analyse, descriptive statistics, correlation analysis, ADF unit root test, ARCH, and GARCH volatility model and ARDL method of cointegration have been employed in the present research work. The entire analysis test has been conducted using econometric (Eviews 9) software.

Autoregressive Conditional Heteroskedasticity (ARCH) model was proposed by Engle (1982). The model establishes the best influence which can be used in forecasting the variance. Earlier, the past forecasting errors are used for future prediction. The ARCH model is measured as an assessment of a more complex regression that has non-ARCH volatility. On the basis of the ARCH model, the impact of the absent variables could be picked up from the estimated model. The endurance of an ARCH effect perhaps recognizes as evidence of disorder, either by way of structural change or by absent variables. Then, Bollerslev (1986) was developed the Generalised Autoregressive Conditional Heteroskedasticity (GARCH) model. The model is basically assumed that the prediction of unbalanced variance is based on the lagged variance of the asset. GARCH model is a weighted average model of the past squared residuals with declining non-zero value. The GARCH model has the power to predict the conditional variances as well. The basic GARCH model can be expressed below:

$$h_{t+1} = \omega + \alpha(r_t - m_t)^2 + \beta h_t = \omega + \alpha h_t \varepsilon_t^2 + \beta h_t \dots\dots\dots (1)$$

In the above model, we need to estimate the constants (ω), ARCH (α) and GARCH (β) to forecast about the variables and residuals. Along with that, it is also to be kept in mind that the value of $\alpha + \beta < 1$ and the weights must be positive non-zero values that is $\omega > 0, \alpha > 0$ and $\beta > 0$. It was accepted in the theory that the volatility forecast would rely on the large positive and negative share price return. Also, the GARCH model can confine the volatility of the group that showed in financial returns. Generally, the GARCH model is considered as a GARCH (1,1) model. Relevancy of parenthesis of the model is standard notation where the first number refers to the ARCH terms or, number of autoregressive lags for the equation, against the second number deals with the number of specified moving average lags which is basically considered as the number of GARCH terms. But before testing the volatility of the stock market in regard to the selected variables, descriptive statistics, correlation matrix, and stationarity test must be measured as a part of the necessary analysis. Also, the proper lag length must be selected which is extremely crucial for running the appropriate model.

The ARDL model is developed for the purpose of identification of the long-run relationship between Sensex and select three macroeconomic variables using ordinary least squares (OLS) regression. The model is:

$$\ln sx = \alpha_0 + \alpha_1 fii + \alpha_2 \ln er + \alpha_3 \ln cop + \varepsilon_t \dots\dots\dots (2)$$

Where $\ln sx$ is natural logarithm of BSE-Sensex (stock price index), fii is Foreign Institutional Investment, $\ln er$ is natural logarithm of the rupee-dollar exchange rate, $\ln cop$ is the natural logarithm of international crude oil price and ε_t is error terms.

While choosing the optimum lag length, it has been found as lag 3 based on AIC value. The unrestricted error correction form of ARDL model is used to observe the long-run and the short-run association obtains the following structure.

$$\Delta \ln sx = \delta_0 + \delta_1 t + \delta_2 fii_{t-1} + \delta_3 \ln er_{t-1} + \delta_4 \ln cop_{t-1} + \sum \alpha_i \Delta \ln sx_{t-i} + \sum \beta_i \Delta fii_{t-i} + \sum \mu_i \Delta \ln er_{t-i} + \omega_i \Delta \ln cop_{t-i} + \varepsilon_t \dots\dots\dots (3)$$

Where t is time trend and \ln means that the variables have been transformed into a natural logarithm. The first division of the equation with δ_2 , δ_3 , and δ_4

denotes the long-run coefficients and the second division with α , β , and μ denote the short-run coefficients. The null hypothesis of no cointegration $H_0 : \delta_2 = \delta_3 = \delta_4$ $H_0 : \delta_2 = \delta_3 = \delta_4$ and the alternative hypothesis $H_1 : \delta_2 \neq \delta_3 \neq \delta_4$ entail cointegration amongst the time series. But before or after testing cointegration, it is essential to check the residuals.

IV. EMPIRICAL RESULTS AND ANALYSIS

4.1 Descriptive statistics

The main aim of descriptive statistics is, to sum up, the whole population in a widespread way without coming into the main conclusion. Table 1 shows that the mean value of mean foreign institutional investment (fii), the exchange rate (lner), crude oil price (lncop), and Sensex (lnsx) are more than median which indicates these are more skewed from the normal distribution. Again, the Jarque-Bera test is conducted to test the normality of data. The probability of the Jarque-Bera test confirms that the data set is not normally distributed.

TABLE 1

Descriptive Statistics

	lnsx	lner	lncop	fii
Mean	10.42	4.31	2.86	-1774.9
Median	10.36	4.32	2.93	-1586.1
Max.	10.64	4.34	3.48	17020
Min.	10.16	4.26	0.00	-16120
S. D.	0.13	0.03	0.54	4945
J.B. Stat	47.66	38.15	122.04	35.87
Prob.	0.00	0.00	0.00	0.00
n	73	73	73	73

4.2 Correlation analysis

Correlation statistics help to identify the strength and direction of the relationship among the variables. The positive correlation means that any change in the positive direction of any variable because of the market shock. Table 2 shows that both FII and COP are positively associated with Sensex but exchange rates are negatively associated with Sensex.

TABLE 2

Correlation Statistics

	lnsx	lner	lncop	fii
lnsx	1.00	-0.71	0.62	0.30
lner		1.00	-0.70	-0.43
lncop			1.00	0.38
fii				1.00

4.3 ADF unit root test results

With the intention to test the stationarity of the data ADF unit root test has been conducted both at the level and at 1st differenced. The result (shown in Table

3) at a 5 percent significance level confirms that FII is stationary at a level while the Sensex, exchange rate and crude oil price are non-stationary at the level. After converting it into the 1st differenced, all the variables are stationary.

TABLE 3
ADF Unit Root Test Results

Variables	Trend & Intercept at level			Trend & Intercept at 1 st differenced		
	t-statistic	C.V. at 5%	Decision	t-statistic	C.V. at 5%	Decision
lnsx	-1.10	-3.49	Non Stationary	-6.12	-3.49	Stationary
lnex	-0.36	-3.49	Non Stationary	-6.47	-3.49	Stationary
lncoy	-2.33	-3.49	Non Stationary	-7.21	-3.49	Stationary
fii	-4.40	-3.49	Stationary	-9.81	-3.49	Stationary

4.2 Lag length selection

Now it is very important to find out the optimum lag length for further analysis. For determining the proper lag length, three main information criteria i.e. the Akaike Information Criterion (AIC), the Hannan-Quinn Criterion (HQC), and the Schwarz-Bayesian Criterion (SBC) are considered in this study. In order to measure the optimal lag length in our model, we use a maximum lag order of 4.

The results in Table 4 show that the optimum lag length of AIC is 2 because of the minimum value than the values of SBC and HQC.

TABLE 4
Lag Length Criteria

Lag	LogL	LR	AIC	SBC	HQC
1	-29.14	306.75	-18.68	-17.80*	-18.34*
2	-10.67	27.47	-18.86*	-17.35	-18.24
3	10.45	31.66	-18.81	-16.92	-18.17
4	14.58	5.52	-18.81	-16.18	-17.80

*indicates lag order selected by the criterion. **LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SBC: Schwarz bayesian criterion; HQC: Hannan-Quinn information criterion

4.3 Stock market volatility

The volatility of the stock market is derived from internal and external macroeconomic news, the structural changes of any existing method in the stock market, and arbitrage. The volatility helps to forecast the uncertainties connected with any changes in select variables. We have used Autoregressive Conditional Heteroscedasticity (ARCH) model and Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model for testing volatility.

TABLE 5

Mean Equation and Variance Equation of ARCH Model

Mean Equation		
Variable	Coefficient	Prob.
C	0.05	0.10
D(fii)	0.06	0.01
D(lncop)	0.06	0.01
D(lner)	-0.38	0.00
Variance Equation		
C	0.03	0.00
GARCH	0.17	0.00

The result shows (shown in Table 5) that Sensex and selected variables are volatile in the short-run as a whole and statistically significant at a 5% significance level. The result shows that FII is positively volatile and a 1% change in FII, Sensex is increased by 6%. COP is also positively volatile and a 1% change in crude oil price, Sensex is increased by 6%. Again, the exchange rate is negatively volatile and a 1% change in the exchange rate, Sensex is dropped by 38% under study. This indicates that the shareholder's risk is more in this market due to the volatility in the short-run.

TABLE 6

Mean Equation and Variance Equation of GARCH Model

Mean Equation		
Variable	Coefficient	Prob.
C	0.06	0.10
D(fii)	0.04	0.04
D(lncop)	0.14	0.01
D(lner)	-0.52	0.00
Variance Equation		
C (ω)	0.10	0.08
ARCH (α)	0.05	0.02
GARCH (β)	0.88	0.00

The result shows (shown in Table 6) that Sensex and selected variables are volatile in the long-run as a whole and statistically significant at a 5% significance level. The result shows that FII is positively volatile and a 1% change in FII, Sensex is increased by 2%. COP is also positively volatile and a 1% change in crude oil price, Sensex is increased by 6%. Again, the exchange rate is negatively volatile and a 1% change in the exchange rate, Sensex is dropped by 52% under study. This indicates that the shareholder's risk is also more in this market due to the volatility in the long-run.

TABLE 7

Diagnostic Test Results on Volatility Model

Test	Statistic	Probability
Serial Correlation LM Test	1.12	0.66
Heteroscedasticity Test	1.94	0.23
Normality (Jarque-Bera) Test	1.88	0.37

The diagnostic test results in Table 7 show that the residuals are not serially correlated, homoscedastic, and normally distributed.

4.4 ARDL bound test results for long-run coefficient

To check the existence of a long-run association among the select variables, F-test is performed for the combined influence of the coefficients of the lagged levels of variables and the value has been compared with the Pesaran critical value at 5% level. Following two hypotheses are chosen to analyse the result:

H_0 : Cointegration does not exist among variables.

H_1 : Cointegration exists among variables.

The ARDL bound test result (shown in table 8) demonstrates that the value of F-statistics is 4.02 and the value is more than the lower bound limit and lowers than the upper bound limit of the Pesaran critical value at the 5% level. Hence it can be concluded that there exists a cointegration among the variables in the long-run.

TABLE 8

ARDL Bound Test Results for Long-Run Coefficient

Test Statistic	Value	Significance Level	I(0)	I(1)
F-statistic	4.02	5%	3.47	4.45

4.5 ARDL bound test results for short-run coefficient

The short-run association between Sensex and select three macroeconomic variables has been presented in Table 9. It shows that both FII and crude oil prices positively influenced the Sensex, which is statistically significant at a 5% level of significance. This entails that; a 1% increase in FII creates a 6% increase in Sensex in the short-run. Again, a 1% decrease in COP creates a 12% increase in Sensex in the short-run. Both matches with the theory because an increase in FII increases the trend of a positive stock market change and a decrease in COP increases the trend of a positive stock market change. Both are significant statistically at a 5% level of significance. Again, a 1% increase in exchange rates creates a 9% decrease in Sensex in the short-run. The exchange rate negatively influenced the Sensex, which is also statistically significant. This is a good scenario for the Indian export market for some time.

TABLE 9

ARDL Bound Test Results for Short-Run Coefficients (DV: Sensex)

Variable	Coefficient	S. E.	t-Statistic	Prob.
D(LNSX(-1))	-0.12	0.02	-5.65	0.00
D(LNSX(-2))	-0.12	0.02	-5.31	0.00
D(FII)	0.06	0.01	4.44	0.00
D(FII(-1))	0.01	0.01	3.72	0.03
D(FII(-2))	0.01	0.01	1.02	0.19
D(LNER)	-0.09	0.03	-5.11	0.00
D(LNER(-1))	-0.34	0.41	-0.93	0.52
D(LNER(-2))	-0.58	0.42	-1.52	0.21
D(LNCOP)	-0.11	0.01	-6.75	0.00

Variable	Coefficient	S. E.	t-Statistic	Prob.
D(LNCOP(-1))	-0.07	0.01	-3.98	0.00
D(LNCOP(-2))	-0.21	0.01	-6.02	0.00
ECMt-1*	0.31	0.01	7.18	0.00
C	-2.11	0.24	-4.09	0.00
R-squared	0.63	F-statistic (Prob.)		10.08 (0.00)
Adjusted R-squared	0.60	Durbin-Watson stat		2.01

The short-run adjustment procedure is observed from the ECM coefficient. The coefficient of the lagged error-correction term is 0.31, which is statistically significant at the 1 percent level. The error correction term (ECT) is positive and significant, which indicates that there is a disturbance in the system identified by the relationship; it is accepted and accustomed towards short-run equilibrium at a speed of adjustment of 31 percent.

4.6 Diagnostic test results

4.6.1 Serial correlation test result

Test of serial correlation is important to check whether there exists any autocorrelation in the model. For the purpose of testing Breusch-Godfrey Serial Correlation LM Test following two hypotheses were chosen:

H_0 : The model has no serial correlation.

H_1 : The model has a serial correlation.

TABLE 10

Breusch-Godfrey Serial Correlation LM Test Result

F-statistic	0.55	Probability	0.86
Obs*R-squared	2.49	Probability	0.59

The F-statistics value is 0.55 with probability 0.86 and observed R-squared value is 2.49 with probability 0.59 of Breusch-Godfrey Serial Correlation LM test confirms that the null hypothesis is accepted and proves that the model has no serial correlation.

4.6.2 Normality test result

A normality test is conducted to identify whether the developed model is under normal distribution or not. The probability of the Jarque-Bera statistics (432.02) confirms that residuals are normally distributed.

4.6.3 Heteroskedasticity test result

This test is important to find out whether the model exists any heteroskedasticity problem or not. This research work entails ARCH heteroscedasticity test considering the following two hypotheses are chosen for testing the heteroscedasticity:

H_0 : There does not exist a heteroskedasticity effect.

H_1 : There exists a heteroskedasticity effect.

TABLE 11

Heteroskedasticity (ARCH) Test Result

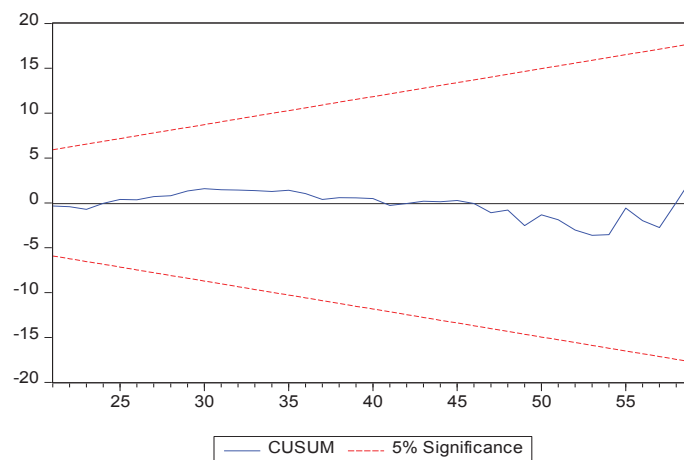
F-statistic	0.98	Probability	0.71
Obs*R-squared	1.95	Probability	0.29

F-statistics value of 0.98 with probability 0.71, together with the value of observed R-squared 1.95 with the probability of Chi-square (0.29) of the heteroscedasticity test accepts the null hypothesis and confirms that the model does not have any heteroscedasticity problem.

4.6.4 Stability test result

For testing stability of a model one important test namely the CUSUM test has been conducted in this research work. The result of the CUSUM test confirms that the model is stable at 5% significance level.

FIGURE 1
Stability Test



V. CONCLUSIONS

This research work investigates the stock market volatility in India as well as the impact of three important macroeconomic indicators on Sensex in India in the situation of coronavirus. The findings demonstrate that (i) selected variables are not normally distributed, (ii) both FII and COP are positively associated with Sensex but ER is negatively associated with Sensex, (iii) Sensex, ER and COP are not stationary at the level and FII is stationary. However, all the variables are stationary at 1st differenced. Both ARCH and GARCH test results show that the Indian stock market is volatile and the shareholder's risk is more in this market due to the volatility in the short- and long-run. ARDL bound test result shows that there is cointegration among the variables in the long-run and short-run. ARDL bound test result also shows that crude oil price and FII positively influenced the Sensex but exchange rates negatively influenced the Sensex. But the exchange rate is not harmful in the short-run but it is not helpful in the long-run. If the system is disturbed, a speed of 31 percent will be adjusted towards short-run stability.

Proper management can be taken by the government for taking the benefits of crude oil price. A favourable economic environment should be maintained in order to increase the FII and a flexible system should be taken by the government to facilitate that the exchange rates do not flow more isolated from the basic stability,

which positively affects the Indian stock market.

Unemployment rates, index of industrial production, and interest rates are very much important to identify the exact impact on the stock market in India during the pandemic period. But due to the unavailability of the daily data of these variables, these are not considered in this research work. The study could have been improved if we could consider the monthly data of all the macroeconomic factors together. This may be a future research study.

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The Relationship between Stock Prices and Accounting Variables: Evidence Based on BSE Listed Cement Companies

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ABSTRACT

The present article seeks to examine the effect of earnings per share, book-value per share and dividend per share on stock prices in India with special reference to BSE listed cement companies. The study covers a period of 5 years from 2015 to 2019 and employs correlation analysis and panel data regression to analyse the data. The empirical results suggest that book-values and dividends are positively related to market prices of equity shares while the regression coefficient of earnings per share is found to be insignificant. The study concludes that book values and dividends are value relevant.

Key words: Accounting variables, Cement companies, Regression analysis, Earnings per share, Book value per share, Dividend per share

I. INTRODUCTION

The primary aim of financial statements is to provide accounting information related to the firm to the present and potential investors. The reported accounting information is assessed by the shareholders and accordingly, the movement in stock prices takes place. The strand of literature which connects the accounting information to share prices comes under the concept of value relevance. Accounting information is said to be value relevant if it explains the variation in stock prices (Osundina *et al.*, 2016; Beisland, 2009). Barth *et al.* (2001) expressed that accounting numbers are value relevant when they are both relevant and reliable. The reliability of the accounting information depends on the regulatory frameworks and unbiased presentation of results whereas relevance depends on the flow of information mechanism as well as its effectiveness for investors while taking the investment decisions (Khanna, 2014).

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There is an abundance of literature on the usefulness of the accounting information in predicting stock prices in developed markets. However, emerging markets have received little attention from researchers and academicis. Emerging markets are characterized by poor market efficiency, presence of unsophisticated investors, low liquidity levels and these characters are different from a developed market. Thus, the examination of value relevance of accounting information is worthwhile in an emerging market like India.

India, an emerging market, is the largest producer of cement after China. The industry has large potential for growth given the government initiatives for developing infrastructure and housing projects, ready availability of raw materials, bright future prospects as Eastern States of India being a prospective market and expected future of becoming the main exporter of clinker and grey cement for other developing nations. The bright future of the cement industry makes it an industry which is of vital importance in Indian economy and it becomes worthy to examine the factors or information which affects the movement of the share prices of the cement companies. Thus, the present study focuses on examining the effect of accounting variables on stock prices in India with special reference to BSE listed cement companies.

The remainder of the paper is as follows: section 2 deals with the literature on value relevance of accounting variables, section 3 explains the data source and methodology, section 4 discusses the results and section and 5 contains the concluding remarks.

II. LITERATURE REVIEW

The value relevance of accounting information is studied extensively by researchers. The present section discusses some of the important articles relating to the area.

Ball and Brown (1968) examined the effect of reported income as accounting information on stock prices. The study concludes that reported income contains as much as half of all the information relevant for explaining stock prices, a major portion of which already adjusted the stock prices in the previous 12 months from the date of reporting and the variables could explain only 20% of the variation in stocks in the month of reporting. Naceur and Goaid (2004) reported that book value and earnings are value relevant while investment policies and debt are value irrelevant. Further, the study provided evidence that dividend policy is a signalling device for Tunisian firms. Pirie and Smith (2008) extended the market based accounting research by examining the relationship between two accounting variables and stock prices in Malaysia. The study covered a ten-year period from 1987 to 1996 and applied panel regression analysis. The results showed that both the accounting variables namely earnings per share and book-value per share are significant in the valuation process. Sharma (2011) empirically analysed the impact of book value per share, dividend per share, earnings per share, price-earnings ratio, dividend yield, dividend payout, size as proxied by sales and net worth on market prices of shares. The data for the variables has been considered from the year 1993-94 to 2008-09 and correlation and regression has been applied. The study found that the earnings per share, dividend per share and book-value per share positively affect the market price of equity shares while the dividend

yield has a negative effect and the influence of other selected variables were not significant. The study advises the investors to consider the accounting variables before investing. Glezakos (2012) produced evidence of the relationship of earnings per share and book-value per share with stock prices in Athens stock exchange during 1996 to 2008. Basically, the study used Ohlson's model and found that over the years the explanatory power of earnings has declined while the joint explanatory power of variables has increased. Sharma et al. (2012) investigated the value relevance and its impact on firms' stock prices. The author employed multiple regression models and concluded that only return on net worth is a useful measure for investment decisions. Pervan and Bartulovic (2013) observed that the relevance of book value in predicting stock price movement was higher than the value relevance of earnings per share in case of 6 different markets of South Eastern European countries. The study concluded that the investors of observed markets consider value relevance factors of balance sheets more informative than the factors of profit and loss account. Nyabundi (2013) observed the effect of earnings per share, dividend per share and book-value per share on stock prices of companies in Kenya for 6 years, from 2005 to 2010. By employing panel data analysis the study found all the variables have significant positive effects on the stock prices. In addition, dividends were proved to be a more informative factor in comparison to the other variables. Wang et al. (2013) investigated whether accounting information are significant factors in the valuation process of 60 companies listed in Shanghai stock exchange. The findings indicated that return on equity and earnings per share are the most significant variables in the stock valuation process. Vijitha and Nimalathasan (2014) investigated the value relevance of accounting information in Srilankan manufacturing companies. The study covered a period of 5 years and employed correlation analysis and multivariate regression analysis. The authors concluded that earnings per share and net asset value per share were value relevant. However, accounting variables like return on equity and price-earnings ratio have no significant impact on share prices. Modi and Pathak (2014) considered earnings per share, dividend per share, profit after tax, gross profit per share, retained earnings per share, cash flow per share, net sales per share and return on investment per share as accounting information and empirically investigated the effect of the variables on the stock prices in India. The study found dividend per share and book value per share as the most influential value relevance factor followed by earnings per share while other factors were not significant. Sharma (2014) studied the effect of dividend per share, book value per share and earnings per share on the stock prices of 20 public and 20 private sector companies listed in BSE. The study found all the variables as value relevance both for private as well as public companies. For private sector companies, the effect of dividend per share and book value per share has increased over time but the effect of earnings per share has decreased whereas, the effect of only dividend has increased in case of public companies. Overall, the study concludes that value relevance of accounting information is more in case of private companies than in public companies. Ahmadi and Bouri (2016) investigated the value relevance of earnings per share and book value per share in case of banks and other financial institutions listed in Tunisian stock exchange from the year 2010 to 2015. After employing panel regression analysis the study concluded that the accounting information efficiently explains variations in stock prices and book value per share

was more efficient as explanatory variable of stock prices than the earnings per share. Velankar (2017) considered earnings per share and dividend per share as internal factors and studied their relationship with stock prices of Indian public sector banks from the year 2006-07 to 2014-15. The study employed regression analysis and found the stock prices to be significantly affected by the earnings per share and dividend per share and both the accounting variables could explain 83.43% of variation in stock prices. Kumari and Mishra (2018) observed the relationship of earnings per share and book value per share with market price of stocks listed on BSE for the period from 1995 to 2015. The period of 21 years has witnessed the various accounting regulation reforms and hence the study could conclude that both the variables have significantly increased their value relevance with the intervention of new regulatory reforms. Ohonba (2019) investigated the relationship of Nigerian banking stock prices with earnings per share, dividend per share and book value per share for a period of 7 years, from 2010 to 2017 in order to know the effect of IFRS reporting on value relevance of the variables. Earnings per share and dividend per share were found to be more significant as value relevance factors but book value per share was not found to be value relevant after the introduction of IFRS.

On the basis of above literature, the following hypotheses are formulated:

H₁: There is a significant positive relationship between earnings per share and stock prices.

H₂: There is a significant positive relationship between book value per share and stock prices.

H₃: There is a significant positive relationship between dividend per share and stock prices.

III. DATA AND METHODOLOGY

The objective of the present article is to examine if accounting variables namely earnings per share, book-value per share and dividend per share can explain the variability in market prices of equity shares of BSE listed cement firms. The sample comprises 39 cement firms listed in BSE (see appendix) and covers a period of 5 years from 2015 to 2019. The data related to accounting variables is collected from the annual reports of the respective firms while market prices of equity shares are obtained from the official Website of BSE. The study considered the market prices of equity shares as on 31st March of each year. The definitions of the variables are presented in Table 1.

TABLE 1
Operational Definitions

	Variables	Definition	Symbol	Expected Relation
Dependent Variable	Market Price of Equity Shares	Market prices of equity shares as on 31st March each year of the study period.	MPS	
Independent Variables	Earnings per share	It is computed as a firm's profit divided by the outstanding shares of its common stock.	EPS	+
	Book-value per share	It is computed as the amount of shareholder's equity divided by the number of outstanding shares.	BVPS	+
	Dividend per share	It is calculated as the sum of declared dividends (including interim dividends) over the period of a year divided by number of outstanding shares.	DPS	+

The valuation model proposed by Ohlson (1995) is employed to capture the effect of accounting information on market prices of equity shares. The study employed panel data analysis since it captures the differences across individual cross sections better than time series or cross-section modelling.

The analysis starts with calculating the descriptive statistics for all the variables. To examine the association among the variables correlation coefficients is calculated and checked for statistical significance. To determine whether to apply the fixed effect model or the random effect model, Hausman test is used. Finally, the relationship between the selected accounting variables and stock prices is established using the panel data regression.

To achieve the objective of the study the following regression model is framed.

$$MPS = \beta_0 + \beta_1(EPS) + \beta_2(BVPS) + \beta_3(DPS) + \varepsilon$$

Where, β_0 is the intercept of the regression equation, $\beta_1, \beta_2, \beta_3$ are the coefficients of independent variables and ε is the error term.

IV. RESULTS AND DISCUSSION

TABLE 2

Summary Statistics

	MPS	EPS	BVPS	DPS
Mean	790.4810	23.88051	229.8334	4.680513
Std. Dev.	2480.785	54.68093	402.426	12.32707
Skewness	5.572450	4.740391	3.769909	7.705216
Kurtosis	35.26109	28.81693	19.93770	78.54047
Jarque-Bera	9465.519	6145.742	2792.844	48293.74
Probability	0.000000	0.000000	0.000000	0.000000
Coefficient of Variation	3.1383	2.2897	1.7509	2.6336

Source: Authors' own calculation.

The summary statistics of the variables used in the correlation and regression analysis is reported in Table 2. The mean value of MPS, EPS, BVPS and DPS are 790.481, 23.880, 229.833 and 4.680 respectively. The coefficient of variation calculated using the mean value and standard deviation indicates that MPS is the most volatile variable. Among the accounting measures DPS is the most volatile followed by EPS and BVPS. The kurtosis values indicate that the variables have leptokurtic distribution while the analysis of skewness concludes that all the variables are positively skewed. Finally, the Jarque-Bera statistics confirms that at 5 per cent level none of the variables follows a normal distribution.

TABLE 3

Correlation Analysis

	MPS	EPS	BVPS	DPS
MPS	1.000000			
EPS	0.904947* [29.54457]	1.000000		
BVPS	0.927537* [34.47878]	0.908210* [30.14767]	1.000000	
DPS	0.827969* [20.51185]	0.839910* [21.49962]	0.806566* [18.95509]	1.000000

Source: Authors' own calculation.

*and** statistically significant at 1 per cent and 5 per cent level respectively t-statistic in []

The result of correlation analysis is summarised in Table 3. The results indicate that EPS, BVPS and DPS have significant strong positive association with the market prices per share (MPS). The correlation results further indicate the existence of multicollinearity among the independent variables. However, the present study applies panel regression technique instead of pooled OLS regression to avoid the problem of multicollinearity.

TABLE 4

Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	39.655	3	0.000

Source: Authors' own calculation.

The study employed the Hausman test in order to determine whether a fixed effect model or random effect model is appropriate. The output of the Hausman test is summarised in Table 4. The result shows that the chi-square test statistic is statistically significant which indicates that the fixed effect model is the appropriate model to investigate the relationship between stock prices and accounting information.

TABLE 5

Panel Regression Test Results

Variable	Fixed Effects				Random Effects			
	Coefficient	S. E.	t-stat	Prob.	Coefficient	S. E.	t-stat	Prob.
C	-229.994	35.782	-6.427	0.000	-287.271	114.791	-2.502	0.013
EPS	-1.502	0.808	-1.859	0.065	-1.029	0.804	-1.279	0.202
BVPS	4.019	0.163	24.532	0.0000	4.219	0.152	27.697	0.000
DPS	28.616	2.307	12.400	0.0000	28.583	2.305	12.399	0.000
R-squared = 0.995, Adjusted R-squared = 0.993, F-statistic = 733.554 (Prob. 0.000)								
Durbin-Watson Statistic = 1.872								

Source: Authors' own calculation.

The results corresponding to the fixed effect model is presented in Table 5. The coefficient of EPS is negative and statistically insignificant at 5 per cent level. The insignificant coefficient of EPS shows that the information of EPS does not cause movement in stock prices. In other words, investors do not rely much on the EPS information while selecting the stocks of cement companies. The coefficients of both BVPS and DPS are positive and statistically significant at 5 per cent level. The sign of the coefficients of both BVPS and DPS is consistent with the theory.

BVPS is used by market participants to determine whether the firms' stocks are undervalued. If BVPS is higher than the market price of shares it means that the shares are undervalued while a lower BVPS suggests that the shares are overvalued. A rational investor perceives an undervalued share as valuable on the other hand investment in an overvalued stock is considered as a bad investment decision. In the present study the coefficient of BVPS is positive which suggests that increase in firm's BVPS is followed by increase in share prices which is consistent with the theory. The positive coefficient of DPS confirms the positive influence of dividend payments on the stock price of BSE listed cement firms. R^2 of the regression output is 0.995 while the adjusted R^2 is 0.993 which indicates that around 99 per cent of the variations in market price of equity shares are explained by the three independent accounting variables. The findings indicate that hypotheses numbering H_2 and H_3 hold true and are significant while hypothesis numbering H_1 does not hold true.

V. SUMMARY & CONCLUSION

The study investigates the effects of accounting variables on stock prices in India with special reference to BSE listed cement companies from 2015 to 2019. Earnings per share, book value per share and dividend per share are considered as independent variables in the present study. The study employs panel data regression with a fixed effects model and the model is selected by using the Hausman test. The correlation analysis indicates that earnings per share, book value per share and dividend per share have a strong positive association with the share prices. The output of panel data regression indicates that book value per share and dividend per share are positively related to the share prices which means that an increase in the value of these variables signals the investors to predict a rise in market prices of shares and vice versa. The coefficient of earnings per share is found negative but insignificant. Overall, the study discloses that investors depend profoundly on dividends and book value in equity valuation while the importance of earnings in equity valuation could not be established. The results relating to book value per share and dividend per share are consistent with the findings of Naceur and Goaid (2004), Sharma (2011) and Pervan and Bartulovic (2013).

The study has at least two *limitations*. First, the study has a limited time period and second, the study only focussed on firms of cement industry. Irrespective of the limitations, the findings of the study contribute to the value relevance literature from emerging markets perspective.

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APPENDIX

List of Companies

Sl No.	Company Name
1.	ACC Ltd.
2.	Ambuja Ltd.
3.	Andhra Cement Ltd.
4.	Anjani Portland Cement Ltd.
5.	Birla Corporation Ltd.
6.	Burnpur Cement Ltd.
7.	Barak Valley Cements Ltd.
8.	Century Textiles and Industries Ltd.
9.	Deccan Cements Ltd.
10.	Everest Industries
11.	Grasim Industries Ltd.
12.	Gujarat Sidhee Cement Ltd.
13.	Heidelberg Cement India Ltd.

Sl No.	Company Name
14.	HIL Ltd.
15.	Indian Hume Pipe Company Ltd.
16.	J.K.Cement Ltd.
17.	J.K.Lakshmi Cement Ltd.
18.	Kakatiya Cements Ltd.
19.	KCP Ltd.
20.	Keerthi Industries Ltd.
21.	Mangalam Cement Ltd.
22.	NCL Industries Ltd.
23.	Orient Cement Ltd.
24.	Prism Johnson Ltd.
25.	The Ramco Cements Ltd.
26.	Sagar Cements Ltd.
27.	Sahyadri Industries Ltd.
28.	Sainik Finance and Industries Ltd.
29.	Sanghi Industries Ltd.
30.	Saurashtra Cement Ltd.
31.	Scan Projects Ltd.
32.	Shiva Cement Ltd.
33.	Shree Digvijay Cement Company Ltd.
34.	Shree Cements Ltd.
35.	Star Cements Ltd.
36.	Udaipur Cement Works Ltd.
37.	Ultra Tech Cement Ltd.
38.	Vardhman Concrete Ltd.
39.	Visaka Industries Ltd.

Source: Compiled by authors.

Performance of Nifty 50 ETFs in India

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ABSTRACT

An ETF is a hybrid type of mutual fund which can be traded as shares or stock on the stock exchange. The ETF industry has grown tremendously over the past few years in terms of the size of mobilized funds and the number of schemes on the market. Evaluating the performance of Indian ETFs through various popular performance measures was considered important. The study is carried out on various selected ETFs listed on the NSE India. The present study is empirical in nature. The study analyses the returns earned by the selected ETFs and compares the fund performance with the return earned by their respective benchmark indices. The study finds that the deviations in the return is low for the funds in comparison to their benchmark return.

Key words: Exchange-Traded Funds, Nifty 50, NSE, Index ETF, Tracking Error

I. INTRODUCTION

An ETF is a fund that contains assets that try to track an index or commodity performance in the stock market, that trade as shares. ETF shares can be purchased and sold on the stock market throughout the day, in the same way as shares. Each share of an ETF constitutes a proportion of the fund's underlying stocks and assets. The value of the ETF share increases and falls with respect to the prices of the underlying stocks or assets.

ETFs are open ended, which means that new shares will be created and the fund holding increased as the demand for its shares increases. When the price of the ETF shares is higher than its underlying securities, arbitrage is used to reconcile the ETF shares Net Asset Value (NAV). If demand for an ETF decreases, the remaining shares are being redeemed and the underlying securities are being sold. Instead of investing in only one or two individual companies, ETFs enables a single investor to own a large number of shares of stocks. Private investors may benefit from a variety of asset portfolios with the same advantages as major institutional investors.

1.1 Statement of the Problem

In the last 10 years, India's mutual fund industry has grown 12.5% annually on average, outperforming the growth world and developed regions by more than double. Asset under management (AUM) of domestic mutual fund industry surpassed the Rs 20.47 lakh core marks in July 2017. Even though the ETF industry is growing, still there is a long way to go. The present work is an attempt

to fill up the gap and help investors to make meaningful investments. Therefore, the present study attempts to popularize the advantages of ETF to small and medium investors. The researcher therefore intends to study the ETF's capacity for performance and tracking. The present study aims to answer the following research questions.

1. In relation to risk and return, how do ETFs perform during the study period?
2. Whether or not the ETFs surpassed the market?
3. Which ETFs is working well and which are lower than expected?

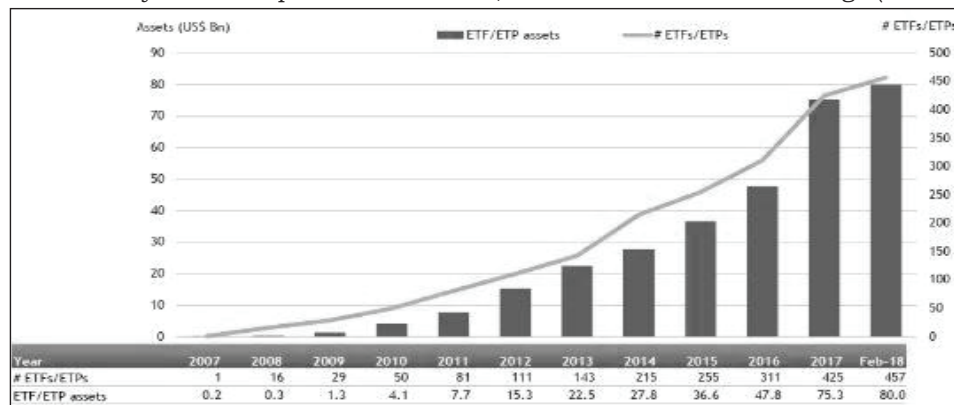
1.2 Significance and scope of the study

Much research has provided attention to the performance of mutual fund products in India, but not on ETFs, so this study is to comprehensively evaluate the performance of ETFs with respect to risk-return perspective. Examining the performance is very difficult for an average investor. It is therefore important to assess the performance of the ETFs, so that retail investors can make value judgments in selecting ETFs for their investment purpose. The present study is initiated in the light of the above observations.

The study is confined to equity index ETFs based on Nifty 50, which are listed on or before 1st April 2016 and traded in NSE India. The Scope of the study is limited to ETFs that are created from equity and listed in NSE that track Nifty 50 index, The study is restricted to the time period from April 2009 to March 2019.

II. History of ETFS

The history of the exchange-traded fund begins with the stock market crash of 1987. On October 19, 1987, better known as Black Monday, the Dow Jones Industrial Average plummeted 508 points, with a loss of \$500 billion in assets. While everyone lost money in the crash, retail investors were the biggest losers. It's the story of the ramification of how a financial invention put on the same level playing field with the Institutional investors. It not only gave the retail fund investors the freedom to trade when they wanted, but also charged the same low fees the institutions paid to buy and sell large baskets of stock. Nathan Most, the Senior Vice President for new product development at the American Stock Exchange (Amex), viewed this as an invitation to The SEC added that if an exchange did design a market-basket security (Eric Balchunas (2016). In 1993, after three years of dispute with the SEC, the American Stock Exchange (AMEX)



Source: Bloomberg Data

2.2 History of ETFs in India

In India, the first ETF was launched on the NSE in January 2002 by the name Nifty Benchmark Exchange-traded Scheme (Nifty BeES) which tracks the CNX Nifty 50 Index. Since then the ETF segment has grown slowly but steadily in India with a total of Rs.1.47 lakh core as on 31st September 2019 as per SEBI estimates (SEBI Annual Report 2018-19). Of these, the ETFs that is gaining popularity among the Indian investors recently are the gold ETFs which attempt to replicate the returns of gold without requiring the physical holding of gold on the part of investors.

III. LITERATURE REVIEW

Gallagher and Segara (2004) exhibited the performance and trading characteristics of exchange traded funds (ETFs) in Australia. The objective of the study is to investigate the ability of index oriented (classical) ETFs to track underlying equity benchmarks on the Australian Stock Exchange. The study found out that index-oriented ETFs closely track their respective benchmarks. Poterba and Shoven (2002) examined the perception of ETFs as tax-efficient alternatives by comparing the pre- and post-tax returns of the largest ETF, the SPDR, with the returns of the largest equity index fund, the Vanguard Index 500 Fund. The results suggest that between 1994 and 2000, the pre- and post-tax returns of the two funds were very similar. Kostovetsky (2003) compares two methods of passive investment using a theoretical model based on investor trading preferences, tax implications, and other variables that weigh the advantages and disadvantages of ETFs relative to index funds. Kostovetsky shows that the key areas of difference are management fees, taxation efficiency, and qualitative differences. Recently, Hilliard's (2014) examination of mispricing associated with ETFs using the Ornstein-Uhlenbeck process augmented with jumps uncovered no mispricing in the case of local US ETFs and higher long-term mean premium and lower speed of adjustments in the case, international equity ETFs and bond ETFs. In light of the fact that the public holding of domestic ETFs is much greater than that of international ETFs in the US. Qadan and Yagil (2012) investigated the price dynamics and tracking ability of 42 local US ETFs and the impact of 2008–09 financial crisis on the tracking ability of the local US ETFs using an error correction model. They find that, except for the ETFs from the real estate and banking and finance sectors, the share price of all other ETFs and their underlying index prices are co integrated, indicating the absence of arbitrage opportunities and the prevalence of a long-run equilibrium. In addition, the tracking ability of ETFs was found to be positively related to the trading volume and negatively related to the daily volatility of ETF. Prashanta Athma & K. Raj Kumar (2011) covered the trends and progress of ETFs and Index Funds in India and evaluate the performance of ETFs vis-a-vis Index Funds in India. The statistical tools like Standard Deviation, Beta, Alpha, R-squared and Sharpe Ratio is used for data analysis. It is concluded that ETFs has given better opportunity for the small investors compared to Index Funds. Ewa Lechman (2015) observes that ETFs are funds, structured to mimic the performance of selected financial assets and

are one of the newly established major innovative financial instruments. Yavas, Burhan & Rezayat, Fahimeh. (2016). observes in his paper, investigated the linkages among equity Exchange Traded Funds (ETF) returns and transmission of volatilities of the USA, Europe, and key emerging countries' stock markets. Standard & Poor's 500 (spy) and iShares Europe are used to represent the USA and European stock markets; the emerging market part of the data set consists of daily returns of equity ETF representing broad equity market indices, of the BRIC countries (Brazil, Russia, India and China); the MIST countries (Mexico, Indonesia, South Korea, and Turkey) and South Africa.

3.1 Research gap

Most of the available studies came from the markets of developed countries. ETFs, which in the US are very popular, make about 60% of equity trading via ETFs. ETF literature usually takes the same view. In emerging markets, such as India, very few ETF studies are available. Although preliminary studies have already been conducted in India concerning the performance evaluation of ETFs, no comprehensive effort has been made about tracking error computation or analysis, and the costs of these investment options are associated with, and the best ETF for different investment profiles have been empirically determined. So an attempt to study the trends and advancements of ETFs in India was made in this study.

3.2 Objectives of the study

The following are the objectives of the present study:

1. To evaluate the performance of select ETFs on the basis of various performance measures.
2. To analyse the influence of stock market index in the performance of select ETF.
3. To analyse the performance of select ETFs with reference to the performance of its stock market indices.
4. To compare the return of select ETF with its stock market index.
5. To offer suggestions for better choice to ETF investors.

3.3 Hypotheses

To achieve the second, third and fourth objectives of the study the following Null hypotheses have been formulated and tested.

H₀1: There is no significant difference between the average return of the funds that track Nifty 50 and the average return of Nifty 50.

H₀2: Return of ETF is independent of the return of Nifty 50.

IV. DATA AND METHODOLOGY

4.1 Data source

The study is based on secondary data. The relevant secondary data are gathered from the fact sheet of ETFs, Research, publications, SEBI Manuals, and data collected from websites of National Stock Exchange, Bloomberg, Seeking Alpha etc.. The daily opening and closing prices of the funds were considered.

ETFs ' performance was measured by comparing their daily returns with the underlying index ' returns.

4.2 Research design

The success of any sample depends upon its size and technique chosen for its selection. To construct the sampling frame, all ETFs listed in NSE take into consideration. A total of 14 ETFs was listed on NSE as on 31st march 2019. Out of 14 ETFs listed, 11 ETFs were selected. All the ETFs whose inception date before 1st April 2016 have been included in the sample. The details of various funds selected for the study are given below.

4.3 Sample design

To construct the sampling frame, all ETFs listed in NSE take into consideration. A total of 16 ETFs was listed on NSE as on 31st march 2018. The sampling frame was selected after considering the number of ETFs, launch date and schemes of ETFs. Out of 16 ETFs listed, 11 ETFs were selected for this study. All the ETFs whose inception date before 1st April 2016 have been included in the sample. The details of various funds selected for the study are given.

TABLE 1
Population of ETFs Under Study

Sl. No.	Name of ETFs	Name	Underlying Indices	Launch Date
1	Reliance ETF NIFTY BeES	Reliance Nippon Life Asset Management Limited	Nifty 50 Index	28-Dec-01
2	Quantum Index Fund - Growth	Quantum AMC	Nifty 50 Index	10-Jul-08
3	Kotak Nifty ETF	Kotak AMC	Nifty 50 Index	02-Feb-10
4	MOST Shares M50	Motilal Oswal AMC	Nifty 50 Index	28-Jul-10
5	Invesco India Nifty Exchange Traded Fund	Invesco Mutual Fund	Nifty 50 Index	13-Jun-11
6	Birla Sun Life Nifty ETF	Birla Sun Life AMC	Nifty 50 Index	21-Jul-11
7	ICICI Prudential Nifty ETF	ICICI Prudential AMC	Nifty 50 Index	20-Mar-13
8	Edelweiss Exchange Traded Scheme - Nifty	Edelweiss AMC	Nifty 50 Index	08-May-15
9	SBI - ETF Nifty 50	SBI AMC	Nifty 50 Index	23-Jul-15
10	HDFC Mutual Fund - HDFC Nifty ETF	HDFC Mutual Fund	Nifty 50 Index	Dec. 2015
11	UTI Nifty ETF	UTI AMC	Nifty 50 Index	03-Sep-15

Source: Computed from NSE market data.

4.3 Checking assumptions

The researcher has checked and confirmed various assumptions before proceeding with the multivariate analysis techniques. The data should be checked for certain assumptions to ensure the necessary statistical fit. The parametric or non-parametric nature of data is determined by these assumptions. The major assumptions underlying the multivariate analysis in the research area:

- i. Normality

TABLE 2
Normality of Data

Sl. No.	Exchange Traded Fund	K-S Test Statistics	P Value
1	Reliance ETF Nifty BeES	0.554	0.22
2	Quantum Index Fund - Growth	0.236	0.77
3	Kotak Nifty ETF	0.664	0.15
4	MOSSt Shares M50	0.478	0.32
5	Invesco India Nifty Exchange Traded Fund	0.874	0.22
6	Birla Sun Life Nifty ETF	0.235	0.33
7	ICICI Prudential Nifty ETF	0.645	0.08
8	Edelweiss Exchange Traded Scheme - Nifty	0.178	0.55
9	SBI - ETF Nifty 50	0.136	0.45
10	HDFC Mutual Fund - HDFC Nifty ETF	1.11	0.08
11	UTI Nifty ETF	0.964	0.18

Source: Computed from NSE market data.

4.4 Framework for analysis

The data are analysed with relevant statistical techniques to solve the research problem and to provide information in a synthesized form. The following statistical tools are used in the study to analyse the data:

- i. Descriptive statistics
- ii. Pairwise comparison tests
- iii. Linear regression

The two important financial measures in the context of evaluating the performance of Exchange Traded Funds (ETF) are used in the study are.

- i. Sharpe ratio
- ii. Treynor ratio

V. EMPIRICAL RESULT AND ANALYSIS

5.1 Performance evaluation of index exchange traded fund return and benchmark return

ETFs are an appropriate portfolio for investors for stable returns and low transaction costs. In comparison with the active index funds, spending is extremely low. Also, the long term performance track records of ETFs are fairer than other funds, and market average return is guaranteed by investing in ETFs. Even though

other actively managed funds employ analysts and investment experts to achieve more returns. ETFs is consistent with the performance of their tracking index, so the average cost of the funds are very low as compared with other funds. This is reflected in the returns the investors earn which makes the fund more attractive in the market. Investing in ETFs tracks the desired index as a whole.

TABLE 3
Descriptive Statistics of Select Index ETF and Their Indices

S.N.	Scheme	Mean	S.D.	Minimum	Maximum	Range
1	Reliance ETF Nifty BeES	0.011	0.062	-0.270	0.280	0.550
2	Quantum Index Fund- Growth	0.013	0.054	-0.104	0.276	0.380
3	Kotak Nifty ETF	0.000	0.101	-0.894	0.117	1.011
4	MOSSt Shares M 50	0.005	0.057	-0.273	0.152	0.425
5	Religare Invesco Nifty ETF	0.013	0.057	-0.170	0.180	0.350
6	Birla Sun life Nifty ETF	0.010	0.051	-0.130	0.151	0.281
7	ICICI Prudential Nifty ETF	0.015	0.078	-0.151	0.298	0.449
8	Edelweiss Exchange Traded Scheme - Nifty	0.009	0.073	-0.142	0.223	0.365
9	SBI - ETF Nifty 50	0.009	0.052	-0.100	0.090	0.190
10	HDFC Mutual Fund - HDFC Nifty ETF	0.013	0.040	-0.072	0.117	0.189
11	UTI Nifty ETF	0.012	0.038	-0.057	0.085	0.143
B M	Nifty 50 Index	0.013	0.056	-0.140	0.250	0.390

Source: Computed from NSE market data.

This table reveals that some ETFs earn an average return at par with the benchmark index, some are performing better than their benchmark index, but some are under performing. This means the price of the ETFs are not par with the average price of their respective benchmark. The return earned by the benchmark indices appropriately reflect the returns earned by the corresponding funds which makes investments in ETFs were attractive to the investors. The standard deviation measures the deviation of actual return from the average return for a given period of time. Highest standard deviation denotes highest deviation from the average return which also indicates a high amount of risk associated with the concerned fund. Higher dispersion means the occurrence of lower extreme values and higher extreme values in a series. Risk averse investors prefer funds with a lower dispersion of prices that is with much greater stability. Lower dispersion means more stability in the fluctuation of average prices over time. The descriptive statistics of the select ETFs reveal that the majority of the funds are performing at par or better than the benchmark indices. Price stability of the ETFs should be maintained for providing a consistent return to the investors.

5.2 Performance of index ETFs average returns with respect to their benchmark indices

A benchmark is an unmanaged group of securities that are considered for tracking the performance of certain funds in the market. It is the determined standard or control against which the actual performance or return from an investment is compared. The comparison of ETFs return and benchmark return is justified on the ground that investors chose their portfolio of fund investment by comparing the track record of returns of the fund with their corresponding benchmark return.

5.3 Performance of the ETFs on an average and Nifty 50

A comparison of the performance of ETFs and Nifty 50 is attempted here.

H_0 : There is no significant difference between the average return of the funds that track Nifty 50 and the average return of Nifty 50.

TABLE 4
Paired Samples Correlations of Nifty 50 ETF

Pairs	Schemes	N	Correlation	Sig.
Pair 1	Reliance ETF Nifty BeES & Nifty 50	106	.991	.000
Pair 2	Quantum Index Fund &Nifty 50	105	.953	.000
Pair 3	Kotak Nifty ETF &Nifty 50	97	.944	.000
Pair 4	MOST Shares M50 &Nifty 50	90	.243	.021
Pair 5	Religare Invesco Nifty ETF &Nifty 50	50	.667	.000
Pair 6	Birla Sun Life Nifty ETF &Nifty 50	59	.331	.010
Pair 7	ICICI Prudential Nifty ETF &Nifty 50	34	.840	.000
Pair 8	Edelweiss ETF Nifty &Nifty 50	34	.357	.038
Pair 9	SBI ETF Nifty 50 &Nifty 50	30	.852	.000
Pair 10	HDFC Nifty ETF &Nifty 50	25	.992	.000
Pair 11	UTI Nifty ETF &Nifty 50	28	.983	.000

TABLE 5
Paired Sample Test

		Mean	S.D.	S.E. Mean	t	d	sig
Pair 1	Reliance ETF Nifty BeES - Nifty 50	0.0002	0.0075	0.0007	.206	105	.837
Pair 2	Quantum Index Fund- Nifty 50	0.0007	0.0163	0.0016	.450	104	.653
Pair 3	Kotak Nifty ETF-Nifty 50	0.0002	0.0152	0.0015	.101	96	.920
Pair 4	MOST Shares M50 - Nifty 50	-0.0173	0.0899	0.0095	-1.823	89	.072
Pair 5	Religare Invesco Nifty ETF - Nifty 50	0.0026	0.0531	0.0075	.346	49	.730

		Mean	S.D.	S.E. Mean	t	d	sig
Pair 6	Birla Sun Life Nifty ETF Nifty 50	0.0001	0.0515	0.0067	.016	58	.988
Pair 7	ICICI Prudential Nifty ETF - Nifty 50	0.0013	0.0382	0.0066	.192	33	.849
Pair 8	Edelweiss ETF Nifty- Nifty 50	0.0006	0.0696	0.0119	.053	33	.958
Pair 9	SBI ETF Nifty 50-Nifty 50	0.0060	0.0276	0.0050	1.190	29	.244
Pair 10	HDFC Nifty ETF-Nifty 50	0.0011	0.0052	0.0010	1.082	24	.290
Pair 11	UTI Nifty ETF - Nifty 50	0.0013	0.0071	0.0013	.991	27	.331

Source: Computed from NSE market data.

The positive correlation between the funds tracking Nifty 50 reveals that the price of the two funds moves in the same direction with their respective benchmark index. This means that whenever there is an increase in the average price or average return of the Nifty 50, the corresponding change is seen in the return of the funds in a positive direction but at low degree. The paired sampled test otherwise known as the dependent sample test shows that, the value p is greater than .05 is statistically significant so, the null hypothesis is accepted at 5 % level with regard to fund return. The results show that there is no statistically significant difference between the return earned by the ETFs and the return earned by the benchmark or underlying index. Hence the researcher accepts the null hypothesis. Therefore there exists no significant difference between the return earned by the ETFs and their respective benchmark index Nifty 50. The analysis shows that there exists a negligible mean difference between the average return earned by the benchmark index and the funds tracking the specific underlying index. The fund's returns are at par with their benchmark Index.

5.4 Regression analysis of return of index ETF and benchmark return

The impact of changes in prices or return of the underlying or the benchmark index on the respective ETF can be traced through regression analysis. The ETF return is considered as the dependent variable and the benchmark index return is considered as the independent variable. Regression defines the degree of relationship between the benchmark return and the index fund return. The objective of this analysis is to evaluate whether investors can expect same return by holding an ETF with the underlying benchmark index. Lower tracking errors result in more accurate exposure for investors.

The regression equation is written as follows:

$$\text{the return of ETF} = \alpha + \beta(\text{the return of benchmark})$$

Where, α = constant, β = regression coefficient

5.4.1 Regression analysis of return of Nifty 50

In order to throw light on the behaviour of return under Nifty 50 and the return of the ETF the following hypothesis framed and tested

H_0 : Return of ETF is independent of the return of Nifty 50

TABLE 6
Regression Results of Nifty 50 ETF

	Funds	R2	Standardized Coefficients	df	F	Sig	Alpha (α)	Beta (β)	T	Sig
1	Kotak Nifty ETF	.890	.944	95	770.442	.001	.001	.907	0.624	.534
2	MOST Shares M 50	.803	.877	88	133.812	.001	-.004	.979	-0.954	.343
3	Invesco India Nifty ETF	.844	.967	48	38.396	.001	.006	.772	0.781	.439
4	Birla Sun life Nifty ETF	.910	.931	57	7.029	.010	.007	.397	1.079	.285
5	ICICI Prudential Nifty ETF	.806	.840	32	76.804	.001	-.001	1.142	-0.074	.941
6	Edelweiss Exchange Traded Scheme - Nifty	.727	.857	32	4.660	.038	.004	.646	0.291	.773
7	SBI - ETF Nifty 50	.826	.852	28	74.096	.001	.005	1.129	1.043	.306
8	HDFC Nifty ETF	.984	.992	30	1410.816	.001	.001	1.013	0.842	.409
9	UTI Nifty ETF	.966	.983	26	747.010	.001	.001	1.000	0.920	.366
10	Reliance ETF Nifty BeES	.982	.991	104	5738.110	.001	.001	.957	1.035	.303
11	Quantum Index Fund- Growth	.909	.953	103	1026.206	.001	.002	.916	1.123	.264

Source: Computed from NSE data

5.4.2 Reliance ETF Nifty BeES

A simple linear regression was calculated after preliminary analysis was performed to ensure there was no violation of the assumption of normality and linearity to predict Reliance ETF Nifty BeES price (dependent) based upon Nifty 50 (independent) $b = 0.991$, $t(104) = 1.035$, $<.303$. A significant regression was found $F(1, 104) = 5738.110$, $p <.001$) with an R^2 of 0.982. Reliance ETF Nifty BeES predicted return is equal to $.001 + 0.957$ (Nifty 50). Reliance ETF Nifty BeES return has increased 98.2% by a change in Nifty 50 return. Since P value is less than 0.05, the null hypothesis is rejected at 5% level and accepts that return of Reliance ETF Nifty BeES is dependent on the return of Nifty 50."Beta coefficients are 0.957 and R^2 value is 0.982 shows that the return of the benchmark index is tracked well by the funds trading under the underlying index.

5.4.3 Quantum Index Fund-Growth

The Quantum Index Fund-Growth price (dependent) based upon Nifty 50 (independent) $b = .953$, $t(103) = 1.123$, $<.264$. A significant regression was found ($F(1, 103) = 1026.206$, $p <.001$) with an R^2 of .909. Quantum Index Fund-Growth predicted return is equal to $.002 + 0.916$ (Nifty 50). Quantum Index Fund-Growth return has increased 90.9% by a change in Nifty 50 return. Since P value is less than 0.05, the null hypothesis is rejected at 5% level and accepts that return of ETF is dependent on the return of Nifty 50."Beta coefficients are 0.916 and R^2 value is 0.909 shows that the return of the benchmark index is tracked well by the funds trading under the underlying index.

5.4.4 Kotak Nifty ETF

The Kotak Nifty ETF return (dependent) based upon Nifty 50 (independent) $b = .944$, $t(95) = 0.624$, <0.534 . A significant regression was found $F(1, 95) = 770.442$, $p <0.001$) with an R^2 0.890. Kotak Nifty ETF predicted return is equal to $0.001 + .907$ (Nifty 50). The Kotak Nifty ETF return has increased 89% by a change in Nifty 50 return. Since P value is less than 0.05, the null hypothesis is rejected at the 5 % level and accepts that return of the Kotak Nifty ETF is dependent on the return of Nifty 50."Beta coefficients are 0.907 and R^2 value is 0.89 shows that the return of the benchmark index is tracked well by the funds trading under the underlying index.

5.4.5 MOST Shares M 50

The MOST Shares M50 price (dependent) based upon Nifty 50 (independent) $b = .877$, $t(88) = -0.954$, <0.343 . A significant regression was found $F(1, 88) = 133.812$, $p <.001$) with an R^2 of 0.803. MOST Shares M 50 predicted return is equal to $-.004 + .979$ (Nifty 50). MOST Shares M 50 return has increased 80.3% by a change in Nifty 50 return. Since P value is less than 0.05, the null hypothesis is rejected at 5% level and accepts that return of MOST Shares M 50 is dependent on the return of Nifty 50."Beta coefficients are 0.979 and R^2 value is 0.803 shows that the return of the benchmark index is tracked well by the funds trading under the underlying index.

5.5 Portfolio performance measures of the index funds

The investors of the fund evaluate the performance of the fund based on their performance indicators. The two major indicators of performance for evaluating the risk and return of a fund.

TABLE 7

Ranking the Sharpe Ratio of Select ETF

Sl. No.	Exchange Traded Fund	Sharpe Ratio	Ranking
1	Reliance ETF NIFTY BeES	15.80	1
2	Quantum Index Fund- Growth	15.33	2
3	Kotak Nifty ETF	0.298	9
4	MOSSt Shares M 50	-6.49	11
5	Invesco India Nifty ETF	6.08	4
6	Birla Sun life Nifty ETF	6.05	5
7	ICICI Prudential Nifty ETF	6.249	3
8	Edelweiss Exchange Traded Scheme - Nifty	-4.35	10
9	SBI - ETF Nifty 50	5.44	8
10	HDFC Mutual Fund - HDFC Nifty ETF	5.82	7
11	UTI NIFTY ETF	5.98	6

Source: Computed from NSE market data

This ratio measures the average return earned in excess of the risk free return per unit of volatility or risk assumed in the market. This ratio measures the premium return earned by the investors per unit of market risk assumed. The higher Sharpe ratio indicates better performance of the fund and favors investment by the investor. The investments with a much lower Sharpe ratio are vulnerable to financial losses to the investors as they fail to provide excess return as anticipated by the investors.

TABLE 8

Ranking the Treynor Index of Select ETF

Sl. No.	Exchange Traded Fund	Treynor Index	Ranking
1	Reliance ETF NIFTY BeES	-3.12	10
2	Quantum Index Fund- Growth	5.27	3
3	Kotak Nifty ETF	-0.09	8
4	MOSSt Shares M 50	29.01	1
5	Invesco India Nifty ETF	2.35	5
6	Birla Sun life Nifty ETF	5.19	4
7	ICICI Prudential Nifty ETF	8.09	2
8	Edelweiss Exchange Traded Scheme - Nifty	-2.84	9

Sl. No.	Exchange Traded Fund	Treynor Index	Ranking
9	SBI - ETF Nifty 50	-11.50	11
10	HDFC Mutual Fund - HDFC Nifty ETF	1.69	6
11	UTI NIFTY ETF	0.25	7

This ratio measures the extra return earned by the investor in excess of the risk free return considering the systematic risk involved in the investment portfolio. This ratio measures the premium return earned by the investors per unit of systematic risk in the investment. The higher Treynor ratio indicates better performance of the fund and favours investment by the investor. Unlike the Sharpe index, this ratio considers the beta coefficient of the investment for measuring and evaluating the performance of the specific fund.

VI. CONCLUSIONS

6.1 Major findings

The deviations in the returns are low for the funds in comparison to their benchmark return.

The performance of the Exchange Traded Funds is not in line with the return of their benchmark indices. The differences between the average earnings of selected funds are due to the fluctuations in the earning of their underlying indices.

The paired sample t test values are significant at the 5 % level of significance. This reveals that the return of the Equity Index ETFs is at par with the return of its benchmark index price.

The regression analysis reveals that the index funds beta are close to 1 and a high degree of R^2 value. Which means that the index ETFs return are perfectly tracked the return of the benchmark index. The return of the fund can significantly predict by the trading performance of their underlying indices.

Various performance measures such as the Sharpe index and the Treynor ratio indicate better fund performance in terms of providing good returns to investors.

6.2 Suggestions

If the funds track the underlying index, it can provide a good return on the investment portfolio under same underlying index.

The Exchange Traded Funds should provide consistent returns to attract more investors. The fundamental aspect to maintain a consistent return is to track the prices of the underlying index.

The ETFs should provide diversified options for both the risk averse and risk loving investors. The Sharpe ratio and Treynor ratio, which indicate the performance of the particular fund, should be used as a variable before taking the investment decision.

6.3 Limitations of the study

Size of the ETF Population in India is the main limitation. The study also has not considered macroeconomic factors like changes in exchange rate, GDP, inflation and political risks which could have impacted the performance of the

funds. Performance of ETF analysed only with benchmark Index and not with other mutual fund schemes.

6.4 Further research scope

The present study analysis the performance of ETFs for 10 years. Since the ETF has emerged in India in 2001, the study period can be increased. The present study covered only Nifty 50 based ETFs whereas in further research other types of ETFs can be studied. In this study, only ETFs listed in India are studied, other types of ETFs like ETFs listed in the foreign country from India may be used for further research.

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Issues and Challenges in Cultivation and Export of Mangoes from Malda District, West Bengal: A Perception Study

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ABSTRACT

In spite of occupying the position of the major mango producing district of West Bengal, Malda has not been able to occupy a promising mango export hub of the country because of some genuine problems associated both with respect to cultivation and export of mangoes. The study explores the perception of cultivators and exporters regarding challenges faced by them on the basis of sample survey with a view to providing some suggestions for improvement in the scenario. The study revealed that lack of Government initiative, preservation facilities, training on modern method of cultivation and excessive use of harmful pesticide/chemicals block the way of production and marketing (domestic as well as export) of good quality mangoes in the District. However, District Officials and mango merchants categorized excessive and unscientific use of pesticides and harmful chemicals as a major bottleneck to produce good quality mangoes which ultimately jeopardizes the prospect of Malda to become a mango based economy in the District.

Key words: Mango cultivation, Horticulture, Exports, Growers, Mango varieties, Mango marketing channel

I. INTRODUCTION

Mango (or *Mangifera indica*) is the most important commercially grown fruit crop of India. Scientific fossil evidence suggests mango first appeared in between 25 to 30 million years ago in North East India, Myanmar and Bangladesh, from where it was spread-out to south India and other parts of the world. It is known as the “king of fruits” because of unique taste of good quality mango and mango-products. Mango is not only famous for its pleasant taste, it is also popular with the masses due to its high nutrition value and richness in variety. Mangoes scored 93 out of 100 on the recently introduced Nu Val¹ scoring system for overall nutritional quality (Singh and Sharma, 2010).

Ripe and raw mangoes are used for preparing various products, like *Amsattwa*, *Amchur*, *Pickle*, *Murabba*, *Jam*, *Chutney*, *Sharbat*, and so many items. Good quality

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¹NuVal score is part of a labeling system, which aims to simplify nutritional information on a scale from 1 to 100. The higher the number, the healthier the food.

mango varieties are used for squash. Its starch is used for confectionary industry. Mango also has medicinal use. The ripe fruit has fattening, diuretic and laxative properties. It is helpful in increasing digestive capacity. These may be the reasons why mango ranks only second to pineapple in quantity and value, among the internationally traded tropical fruits.

India is on the pinnacle in mango production in the world (approx 40% of the world's total production) followed by China, Thailand, Mexico, Brazil and other countries. In India, mangoes are mainly cultivated in Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal. West Bengal Ranks amongst the first 10 mango producing States in India. Malda District dominates the total production of the State. It produces almost 40% to 50% of the State's production. About twenty nine thousand acres of land are covered with the mango orchards, which in normal years, bear fruit to the extent of 3,00,000 MT. In view of this, the future of the area is largely dependent upon the improvement of mango-based economic activities.

II. LITERATURE REVIEW AND RESEARCH GAP

Literature on mango cultivation and export from Malda District is very limited. There are different issues relating to its cultivation and export. To conceptualize the problem with respect to the District, following texts and documents have been consulted.

GRANITE² Phase 2 (2009) made an attempt to conceptualize the problems and prospect associated with the export of mangoes from Malda to Bangladesh and other countries. It also discussed the inability of the exporters to export mangoes in developed/developing countries other than Bangladesh.

Ganguly, Ghose and Biswas (2011) made a study on mango economy of Malda District and discussed the importance of inter-linkages among various stakeholders in the mango economy of Malda and recent changes thereon.

Banerjee (2011) made an effort to explore the relations among the area of production of mangoes, cost of the production, value to the growers, loss in the production process, marketing cost and the realizable value of the production. A comparative study of cost and realizable value of different variety of mangoes has been done. The paper also critically analysed the economic value of different mango processed food like *Jam, Jelly etc.*

Patil and Nirban (2011) described the actual scenario relating to export of mangoes from India to different countries. They analysed the reasons of low productivity of Maharashtra in spite of having highest area under mango cultivation.

Project on Sustainable Development of Mango Based Economy of Malda (2012)³ tried to explore the possibilities of mango production after considering different constraints. It highlighted the varieties of mango produced in Malda along with production during the past ten years.

Gopalakrishnan (2013) studied the present marketing systems in India and made suggestions to realize higher value for the produce. The paper also

²Grassroots Reach outs and Networking in India on Trade & Economies (GRANITE) Phase 2 is a report of proceeding of a state level Advocacy workshop.

³The report is published by the Office of the Deputy Director of Agriculture (Fruits), Malda, under the Department of Food Processing industries and Horticulture, Govt. of West Bengal.

tried to focus on the prevailing contract marketing system in India and strongly recommended for shifting from mere marketing to “supply chain management”. Sekhar *et al.* (2014) showed the importance of horticulture including mango production as a major element and its economic value for the sustainable growth of the country. Rosalin and Vinayagamoorthy (2014) described precisely the process of mango marketing after maturity of the fruit. They mainly analysed the problems and perceptions of intermediaries in marketing of mangoes of the District of Salem, Tamilnadu.

The brief review of literature as mentioned above reveals that available literature proved to be dispersed and narrower in scale to gauge the present problems with mango cultivation and export especially for the District of Malda. It is, therefore, imperative to explore these issues through a survey-based study to capture the perception from the horses’ mouth. The present study is undertaken to address some of these issues.

III. OBJECTIVES AND METHODOLOGY

The specific objectives of the study are as follows:

- To analyze the present situation of mango cultivation in Malda District.
- To highlight the problems of mango cultivation of this region and rank them according to the perception of various stakeholders associated with mango cultivation and export.
- To identify bottlenecks relating to the export of the fruit from the District, and
- To suggest the measures to improve the commercial mango-growing environment of the District.

The present study is explorative in nature. It examines socio-economic issues relating to mango cultivation in the District. For that purpose, both primary and secondary data (production and export related primarily for ten years’ period, i.e. 2007 – 2016) were used to evaluate the prospect of mango economy of the District. Besides, it aims at capturing various issues from the perspective of different stakeholders associated with mango farming and its export.

A two-stage sampling technique has been espoused for the entire study. At the first stage, four Blocks⁴ of Malda District (English-Bazar, Manikchak, Ratua-I and Ratua-II) have been selected based on purposive sampling (as they collectively occupy more than 60% area under mango cultivation of the District and collectively produce more than 50% of the total production of the District – which supposed to provide us better information on problems of mango farming as compared to other 11 Blocks where mango production is not a major activity).

In the second stage, Block-wise list of mango cultivators along with their address as obtained from the Office of the Food Processing Industries (FPI) and District Horticulture is used as sampleframe and therefrom we randomly select 30 cultivators from each Block. Total 120 (= 30 × 4) respondents from the 4 Blocks were selected for the survey. The educational profile of respondents is presented in Table 1. In the sample, majority of the growers have Primary level of education

⁴There are 15 Blocks in Malda District. Mangoes are cultivated in all the Blocks. In 2016, Englishbazar Block produces the highest quantity of mangoes followed by Manikchak, Ratua-II and Ratua-I.

(about 46%), followed by Secondary education (about 37%) and Bachelor degree (about 10%). Only 2% of the respondents have Master degree, whereas 5% of the respondents are illiterate.

At first, a pilot survey was conducted in the Engalishbazar Block and based on that knowledge; a structured questionnaire was developed to collect the perception of selected respondents. The questionnaire mainly focused on two aspects – mango production and marketing and export exposure of the growers. The profile of the questions is presented in Table 2. The questionnaire based survey was conducted on the abovementioned four Blocks of Malda District in the year 2018-19. Reliability of the questionnaire has been tested by using Kudar-Richardson 20 (KR-20)⁵ formula and the computed KR- 20 reliability coefficient is 0.749 which is considered to be satisfactory.

TABLE 1
Educational Profile of the Block wise Sample Respondents

Qualification	Ratua I		Ratua II		English Bazar		Manik-chak		TOTAL	
	No	%	No	%	No	%	No	%	No	%
Primary	16	53%	17	57%	10	34%	12	40%	55	46%
Secondary	9	30%	9	30%	13	43%	14	47%	45	37%
Bachelor	2	7%	2	7%	7	23%	1	3%	12	10%
Masters	1	3%	1	3%	0	0%	0	0%	2	2%
Illiterate	2	7%	1	3%	0	0%	3	10%	6	5%
TOTAL	30	100%	30	100%	30	100%	30	100%	120	100%

Source: Survey results and authors' calculation.

TABLE 2
Profile of Questions in the Questionnaire

Focused Area	Dichotomous Questions	Multiple Answers Questions (MAQ) (Number of alternatives)				Open Ended	Total
		III	IV	V	VII		
Production Related (P)	1	1	1	-	1	2	6
Marketing & Export (M&E)	9	-	-	2	-	-	11
P+M&E (both)	-	-	-	-	-	1	1
Total	10	5				3	18

Apart from the mango growers, the opinion of some officers of the District horticulture department, mango merchants or exporters have been taken into consideration using a special type of structured questionnaire to understand the perceptions of the mango growers regarding the opportunities and challenges of mango cultivation of the District. Simple computation, tabulation and cross

⁵Given the nature of questions, KR 20 is suitable for generating a reliability coefficient for the above case and it is regarded as the effective version of widely used 'Cronbach Alfa Coefficient'.

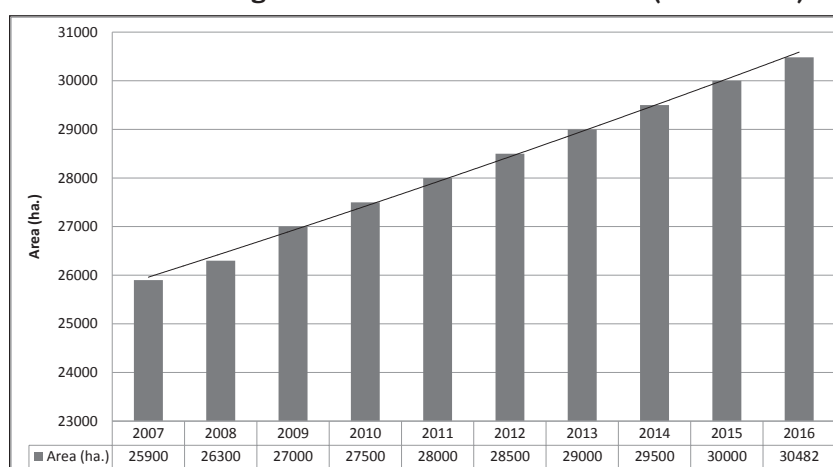
tabulation have been made to facilitate the understanding of the perceptions of the respondents. In this study, ranking method (on the basis of percentage) has been adopted to analyse the Multiple Question Answers (MQA) related to the production and export of mango. Ranking of the multiple responses against any item of the questionnaire expressed the choices of the majority of the respondents as a whole in sequential manner.

IV. PRESENT MANGO CULTIVATION SCENARIO OF MALDA DISTRICT

Malda, a small District of West Bengal, can be designated as the 'Gateway of North Bengal'. The economy of the District is basically an agrarian one and ranks as one of the most underdeveloped Districts in West Bengal. The economy is characterised by low per capita income, low yield per acre of land, industrialization backwardness, lack of capital and entrepreneurship spirit, and also lack of infrastructure and large labour surplus. Despite this backwardness, Malda occupies an important place in the map of the State for production of mango. Production of mango is an important aspect of Malda's economy. Malda alone produces almost 40% to 50% of the State's production during the period under review.

FIGURE 1

Area under Mango Production in Malda District (2007-2016)

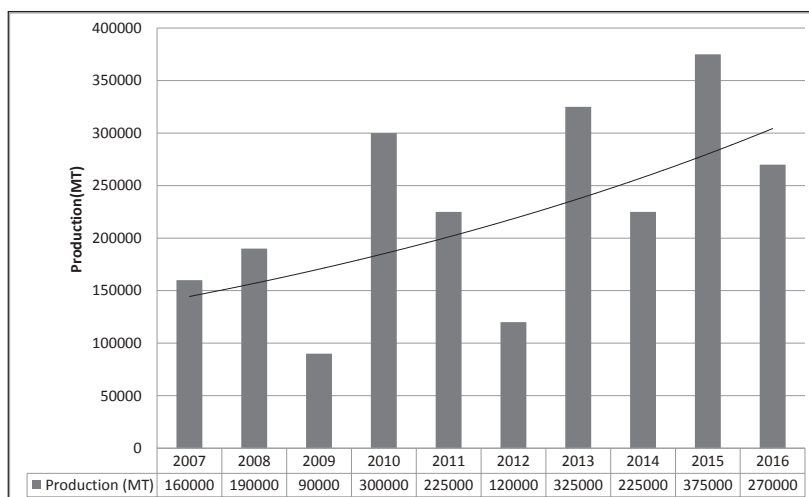


Source: Constructed from the data obtained from Office of the FPI and Horticulture (Malda).

It is evident from Figure 1 that the area under mango cultivation has been increased at a consistent rate but due to 'On year-Off year'⁶ factor there was a clear ups and down in production of the fruit in the past (Figure 2). Production fluctuation due to on-year-off year factor has been reduced in the recent time as chemicals are being used by the farmers or owners of the orchard to overcome the problem. But both area under mango production and year-wise production showed a continuously rising trend over the period under consideration.

⁶Generally, production of mango for a particular year depends on the production of the last year. Usually, huge production of one year is followed by low production of the immediate next year or vice versa. This phenomenon is known as 'On Year'- 'Off Year' factor.

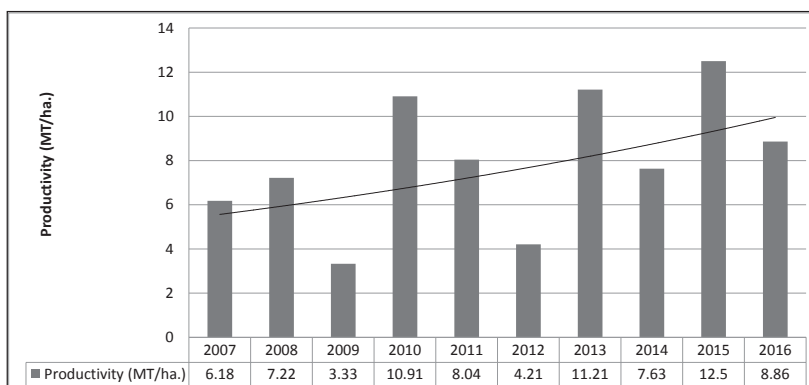
FIGURE 2

Year-wise Production of Mango in the Malda District (2007-2016)

Source: Constructed from the data obtained from Office of the FPI and Horticulture (Malda).

Average yearly production of Malda District during the period 2007 to 2016 is 228000 MT which is the highest average production of any district in the State of West Bengal for the same period. Average productivity of mango in Malda during the same period is 8.009 MT/ha (Figure 3) and it shows a steady increasing trend, whereas the mango productivity in India is estimated at 6.92 M.T./ha and that in case of the world is 7.74 M.T./ha (Singh et al. 2018). Standard Deviation of yearly production of mango for the period of 2007 to 2016 has been measured as 86464 MT.

FIGURE 3

Mango Productivity (MT/ha) of Malda District (2007 - 2016)

Source: Constructed from the data obtained from Office of the FPI and Horticulture (Malda).

There are 15 Blocks in Malda District. Mangoes are cultivated in all the Blocks. Englishbazar Block produces the highest quantity of mangoes followed by Manikchak, Ratua-II and Ratua-I in that order. These 4 Blocks together produce more than 50% of the total production of the District.

TABLE 3

Block-wise Total Area and Production of the District for the year 2016

Sl. No.	Name of the Block	Area (ha.)	Production(MT)
1	Gazole	1204	10665
2	Bamongola	240	2126
3	Habibpur	202	1789
4	Old Malda	2404	21294
5	Englishbazar	9452	83723
6	Manikchak	4064	35995
7	Kaliachak-I	1346	11922
8	Kaliachak-II	2166	19187
9	Kaliachak-III	453	4008
10	Harischandrapur-I	661	5855
11	Harischandrapur-II	910	8066
12	Chanchal-I	1212	10737
13	Chanchal-II	541	4792
14	Ratua-I	2811	24898
15	Ratua-II	2816	24943
Total	Malda District	30482	270000

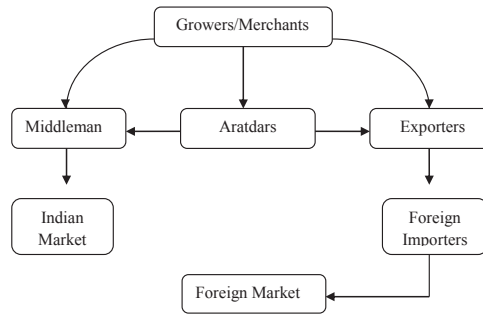
Source: Office of the FPI and Horticulture (Malda).

It is observed from Table 3 that first nine Blocks come under the Malda Sadar Sub Division and total area and production under this sub division are 21530 ha and 190709 MT respectively for the year 2016. Comparatively, remaining 6 Blocks come under the Chanchal Sub Division having total area and production 8951ha and 79291 MT respectively for the same period.

V. MANGO MARKETING SYSTEM IN MALDA DISTRICT

We all know that Mango is a perishable fruit and as such it needs special care for its marketing. Marketing of mangoes includes proper judgment of harvesting maturity, sorting, grading, packaging, ripening, storing and quick transportation followed by quick sales. There are different stakeholders who are actively involved in the marketing system during pre and post harvesting period. Some of them are Mango Merchants or Mahajans, Bariyals, Mango Growers, Aratdars (similar to Stockist), Exporters, Labourers, processing units, packaging unit and women who prepare various mango products. Mango Merchants invest their money to buy or sell the orchards with the help of the Bariyals who actually act as a garden contractor. Bariyal also takes the responsibility to look after the garden during the cultivation period on behalf of the Mahajans on the basis of pre-determined terms and condition. At the time of harvesting, Mahajans sell the produce either to the wholesaler or Aratdars (Stockist) or exporters either at their farm gate or to the wholesale market.

CHART 1
Mango Marketing Channel Prevalent in Malda District



On the other hand, growers grow mango in their own orchard with their own fund and take full charge of its maintenance. During ripening season, either they sale their produce to any middleman at their farm gate or sale to the *Aratdars*. In general, exporters in Malda mainly worked as a commission agent of the mango merchants who actually used to send their consignment directly to Bangladesh importers with the help of the Import-Export Code (IEC) of the former (Gangly *et al.* 2011). The existing mango marketing system is presented through Chart 1.

VI. MAJOR PROBLEMS OF MANGO FARMING IN MALDA DISTRICT

The questionnaire based survey result on this issue is summarized in Table 4 with ranking. As per responses, lack of preservation facilities appeared to be the number one problem followed by lack of Government initiative, lack of modern training, excessive use of pesticides, labour contract problems and poor quality of mangoes and existence of brickfield in that order. But if we consider the responses of the sample units along with the inputs received during the conversation with the district officers, the problems of mango cultivation in the District of Malda can be presented under the following sub-headings according to thing gravity.

1. Use of Harmful Chemicals

Reckless use of synthetic pyrethroids, (Alphamethrin, Deltamethrin, Cypermethrin, Lambda Cyhalothrin, Fenvalerate, etc.) primarily due to low cost, abundant availability, knock-down effect to the insects and lack of awareness among the farmers about their harmful effects, affect the quality of mangoes adversely. Such plentiful use of synthetic pyrethroids causes development of resistance among some of the insect species of mango including Mango Hopper (the most dangerous insect pest of mango). Besides, these insecticides (or pesticides) have been proved harmful to the human body as they have carcinogenic implications. 18% of the total responses categorized the excessive and unscientific use of pesticides and harmful chemicals as a major bottleneck to produce good quality mangoes (Table 4). On the other hand, 21% of the total responses consider this issue as 3rd important factor among the 5 major export barriers (refer to Table 9). The interactions with district officials reveal that the response level is low largely because of the lack of knowledge of the cultivators about the harmful effects of the chemicals.

Use of the pyrethroids can only be controlled if all the farmers of one region together control their use of pesticides. Otherwise, single individual restriction is not possible as insect pest of other gardens (those who are using pesticides) will attack together in the said no pesticides trees of the garden and ruined the entire crop.

TABLE 4

Survey Results regarding Major Problems of Mango Cultivation in Malda

Major Problems	Ratua -1	Ratua -2	English Bazar	Manik- chak	Total	% of Responses	Ranking
i. Poor Quality	4	3	3	9	19	5%	VI
ii. Excessive Pesticide and Chemicals	10	22	13	18	63	18%	IV
iii. Lack of Preservation Facilities	22	23	17	18	80	23%	I
iv. Lack of Modern Training	16	18	18	16	68	19%	III
v. Labour Contract Problems	8	2	13	7	30	8%	V
vi. Brick fields Problem	4	3	6	5	18	5%	VII
vii. Lack of Government Initiative	19	18	25	16	78	22%	II
Total	83	89	95	89	356	100%	

Source: Field survey conducted by the authors.

2. Lease-out System of Mango Orchards

Lease-out system of the mango orchard is very common in the District. Lease out system of the orchards for 2/3 years, does not ensure proper nutrient management of the trees as the leaseholders use cheaper pesticides and other growth retardant to get maximum production. As a result, general health of the trees is gradually worsening which ultimately affect the quality of production. Out of the 120 respondents, 101 respondents (84%) experienced of either taking or giving lease of mango orchard or both (Table 5). Thus, only 16% of the total respondents had experienced of farming their own mango orchard. 23 (19%) respondents and 36 (30%) respondents were ever engaged in lease giving or lease taking activities respectively. 42 (35%) of the total respondents had experience of giving and taking lease of mango orchard.

TABLE 5
Survey Result regarding Lease-out System of Mango Orchard

Category	Ratua-1	Ratua-2	English Bazar	Manikchak	Total Frequency
i. Lease Given	8	5	6	4	23
ii. Lease Taken	10	7	7	12	36
iii. Both (i)&(ii)	6	14	13	9	42
iv. Lease Neither Given nor Taken	6	4	4	5	19
Total	30	30	30	30	120

Source: Field survey conducted by the authors.

3. Lack of Adequate Irrigation Facilities

In case of mango cultivation, it is important to provide regular irrigation after fruit set; otherwise, substantial fruit drop takes place resulting in low production of fruits. But only about 40% of the orchards of the District have irrigation facility. Thus, lack of irrigation facility does not permit farmers to reap full potentiality of the garden.

4. Poor Nutrient Management System of the Orchard

In Malda, there is a lack of scientific and integrated nutrient management. Nutrient management ensures application of microbial fertilizer and organic manure. Mango farmers or growers of the selected 4 Blocks had shown a little interest to spend money on nutrition and growth related aspects of mango trees. Only 8 (6.67%) out of 120 respondents give preference to the nutrition and growth related aspects than other expenditure like pesticides, chemicals, spray or expenditure related to the harvesting and marketing. According to the concerned district horticulture officer, "Though nutrient management in mango orchard started in the District but it has been noticed that during the last 8 years only half of the total area under mango cultivation are fertilized". Even the leaves falling from the trees are collected for use of household fuel. At the same time use of only chemical fertilizers are affecting the soil health adversely. Growers are least bothered about taking initiative for proper canopy management which actually facilitates better growth of the trees. The farmers or owners of the garden are least interested to remove dead or diseased wood and additional growth of flushes to allow more light penetration into the leaf canopy.

5. Lack of Training on Modern Mango Cultivation Technology

Most of the mango growers are either small or marginal farmers with very small holdings which results in poor exposure and adoption to advanced technology. Conventional practices increase the cost of cultivation and negatively affect the quality of production. Only 33 respondents (27.5% of the total respondents) have taken training on modern methods of cultivation and export of mango (Table 7). About 19% of the total respondents indicated lack of modern training on mango cultivation as the 3rd most important problem out of 7 (Table 4). During survey,

13 major suggestions were recorded from the respondents of the four Blocks regarding improvement of mango cultivation and export. Out of these suggestions, need of training on modern mango cultivation ranked second (about 11% of the total responses) jointly with the need of development of proper marketing system.

TABLE 6

Responses regarding Cost of Cultivation of Mango incurred by the Farmers

Item of Expenditure or Cost	Ratua-1	Ratua-2	English Bazar	Manikchak	Total
i. Nutrition and Growth	0	5	3	0	8
ii. Pesticides or Chemicals / Spray / Machine	22	14	18	17	71
iii. Harvesting and Marketing	8	11	9	13	41
Total	30	30	30	30	120

Source: Field survey conducted by the authors.

TABLE 7

Training on the Modern Methods of Mango Cultivation and Export

Particulars	Ratua-1	Ratua-2	English Bazar	Manikchak	Total
Attended training programme	4	9	10	10	33
No training programme attended	26	21	20	20	87
Total	30	30	30	30	120

Source: Field survey conducted by the authors.

6. Inadequate Infrastructure

In order to improve mango cultivation, the infrastructure needs to be improved. This District lacks in terms of infrastructure. Almost 23% of the total respondents of the 4 Blocks indicated lack of suitable mango preservation centre or cold storage, as the foremost important problem among the 7 problems (refer to Table 4). Lack of Government initiative (about 22% of the total responses) in different infrastructural and developmental activities towards mango cultivation is the 2nd most important problem among the 7 other problems (refer to Table 4). Improvement of transportation system from the village to the main market and availability of financial facilities (like bank loan) are some of the other infrastructural requirements for the development of mango cultivation of the District.

7. Existence of Unlawful Brickfields

Some of the respondents were worried about the existence of unlawful burning of brickfields in the vicinity of mango orchards (1.6KM radius) resulting in heavy incidence of 'Black Tip'⁷ of mango. About 5% of the respondents (Table 4) feel it is a major problem of mango cultivation in this area.

⁷Black Tip is popularly known as black spots on the skin of the mango. These black spots affect the look of the fruit initially and have greater chances of being rotten once the fruit matures.

VII. MANGO EXPORT SCENARIO OF MALDA DISTRICT

As chief cash crop, mango cultivation and its marketing are expected to play a vital role in the development of the economy of Malda. Over 33% people are directly associated with the cultivation of this crop. In spite of this, economy of the District has not been developed as expected. International trade of mango provides an opportunity for the economic growth and development of the District.

Himsagar, Fazli, Langra, Aswina and Laxmanbhog are the main exportable variety of mangoes of this region. In case of export to the foreign countries (other than Bangladesh), Laxmanbhog is the most popular variety because of its poetic bent of taste and radiating golden yellow skin with reddish tinge, light sweetness with complete free from fibre. Himsagar and Langra come into the list after Laxmanbhog (about 32% of the total area under cultivation is covered by these three varieties). The export of mangoes from the District of Malda over the years is presented in Table 8, which revealed that Bangladesh had been the major importer of Malda mangoes which, on an average, accounts for about 70%-80% of the total mango production of Malda and more than 99% of the total export of the District. Exporting to neighboring country Bangladesh was easier because of three major reasons, such as:

- Huge demand of different variety of Malda mangoes in Bangladesh;
- Surface to surface road communication via Mahadipur border-Malda, and
- Less quality constraints and easy method of collecting payment for the consignment.

TABLE 8

Export of Mango from the Malda District during 2005 – 2018

Year	Export Quantity(MT)	Export Destination
2005	1.45	U.K
	108000 (72% of total production)	Bangladesh
2006	2.3	Singapore &Malayasia
	112000 (59% of total production)	Bangladesh
2007	2.5	U.K. & Germany
	152500 (95% of total production)	Bangladesh
2008	12.5	U.K
	140500 (74% of total production)	Bangladesh
2009	1.0	U.S.A
	50000 (56% of total production)	Bangladesh
2010	15000(5% of total production)	Bangladesh
2011-2017	NIL	Not Applicable
2018	2.8 MT	U.K

Source: Office of the FPI and Horticulture (Malda).

In the recent past, export to Bangladesh has gone down heavily. It was first observed in the year 2009, when export to that country came down to 56% of the total production of the District. In 2010, it was only 5% of the total production.

Since year 2011, export to Bangladesh has been fully closed because of high import duty imposed by the Bangladesh Government (presently, it is about Rs. 29 per Kg (BDT. 36/Kg). On the other hand, mango production in Bangladesh has been showing a steady growth during the last ten years. In consequence, Bangladesh has started to export mango from the year 2014-15 to Europe as per the Bangladesh Bureau of Statistics, 2015.

Experience of export of Malda mango to other distant countries (like the U.S.A., the U.K., Germany, etc.), is totally different because it demands more quality constraints, proper export infrastructure with assurance of secure payment realization. Under these circumstances, the District has tried to export mangoes to different distant destination of the world in different times with the direct help of State Government. In most of the cases of export to foreign countries other than Bangladesh, they were experimental and different precautions were taken under the supervision of District officers of the department of Horticulture and Food Processing Industries. Special care was taken for selecting each piece of mango weighing between 300–350 grams with no marks on the body, ripe yet hard enough to withstand the pressure of packing and to remain fresh for a certain length of time. In spite of all these initiatives, regular export of mango in large scale has been disrupted in different years. In between 2011 to 2017, there was no export of mango from the District.

VIII. MAJOR CHALLENGES ON EXPORT OF MANGOES FROM MALDA DISTRICT

Malda and Murshidabad together were declared as *Agri Export Zone for Mango in West Bengal* under the Exim Policy of 2001. But even after almost two decades, the export potential of Malda District has not improved. The reasons could be several and diverse. The survey points out lack of Government initiative as the foremost barrier followed by lack of formal training on export related issues, excessive use of chemicals/pesticide, lack of infrastructure and poor quality of mangoes in that order. The survey result on this is presented in Table 9.

The survey outcome and conversation with the different stakeholders, like mango merchants, exporters and officers of the District Horticulture Office revealed that despite opportunities, there are certain economic reasons for which the mango export of this area are not able to gain growth and developments so that it can take a significant place in the map of mango export of the country. The main reasons are:

- More dependency on the Bangladesh market for export;
- Lack of adequate numbers of export quality mango varieties like Alphonso, Kesar, Totapuri, etc.;
- Excessive use of cheaper insecticides, chemical fertilizers and growth retardant like paclobutrazol;
- Lack of infrastructural facilities in the District, such as, post harvest handling infrastructure, cold chain system with refrigerated transport system, modern packaging system, facility of Phytosanitary Certification, and MRL (Maximum Residue Limit) testing laboratory.
- Frequent changes in international standards for importing horticulture product are a real challenge to export mango to the developed countries.

TABLE 9
Survey Results on Major Export Barriers of Malda Mango

Export Barriers	Ratua-1	Ratua-2	English Bazar	Manik-chak	Total	% of Responses	Ranking
i. Poor Quality	3	4	10	10	27	9%	V
ii. Excessive Chemicals/ Pesticide	7	24	13	15	59	21%	III
iii. Lack of Infrastructure	13	13	14	15	55	19%	IV
iv. No Training for Export	14	20	15	16	65	23%	II
v. Lack of Government Initiative	20	22	19	19	80	28%	I
Total	57	83	71	75	286	100%	

Source: Field survey conducted by the authors.

Amidst these challenges, there are some rays of hope in the field of infrastructural development. West Bengal State Food Processing & Horticulture Development Corporation Limited has already established one APEDA assisted pack house with Cold Storage and Vapour Heat Treatment Plant facility. The Central Institute for Sub-Tropical Horticulture (CISH), Lucknow, established its regional research centre in Malda. These are expected to provide valuable support for the upliftment of the mango economy of the region in the days to come.

IX. FINDINGS AND SUGGESTIONS

The aforesaid discussions clearly demonstrate that huge production of mango in the District is not properly reflected in the economy of the District because of several barriers with respect to cultivation and export of mangoes. The findings of the study can be summarized as under:

1. The field survey highlights lack of Government initiative, preservation facilities, training on modern method of cultivation and excessive use of harmful pesticide and chemicals block the way of production and marketing of good quality mangoes in the District.
2. The process is also adversely affected due to poor marketing and supply chain management prevalent in the District.
3. Regarding export of mangoes, the Government initiative is found to be either lacking or inadequate to produce desired outcome.
4. The cultivators also highlighted lack of infrastructure and training on export-related issues along with the poor quality of mangoes produced primarily due to excessive use of harmful chemicals which block the prospect of export of mangoes from Malda.
5. The mango merchants, exporters and officers of the District Horticulture Office, however, pointed out lack of adequate numbers

of export quality mango varieties, frequent changes in international standards for importing horticulture product, excessive use of growth retardant pesticides along with infrastructural lacuna as the main export barriers.

Though international trade offers scope for developing commercial mango farming in the District, yet strengthening of domestic market may be proved effective as the North East States, like Assam and Tripura, have shown their liking towards different varieties of Malda mangoes. Besides, there is a great demand of Malda mango in the State and other parts of the country. In order to overcome the problems associated with the mango export of the District following *measures* may be considered:

1. Strict administrative intervention is desirable to restrict the use of Calcium Carbide (Carcinogenic) for ripening the fruit, Synthetic Pyrethroids, cheap pesticides along with proper training on harvesting.
2. Implementation of Global Good Agricultural Practice (GAP) in a few selected mango orchards of the District so that progressive mango growers can create a favourable export friendly environment in the District.
3. One Central Export Facilitation Centre is required to be established and work in the region for providing information and training to the different stakeholders.
4. Outlet in major export destinations, like Dubai, London, Paris, New York, may be established to promote mangoes of Malda as a brand in international markets.

Proper utilization of the available infrastructure can change the scenario of the commercial mango growing of the District. Last but not the least, is the Bangladesh issue. In the past, Bangladesh had been the major importer of Malda mango for a long time. Now she has imposed several trade barriers for import of mango from Malda. It is a bilateral trade issue between India and Bangladesh. But it can be reduced or partially solved by adopting strategic initiative at the Government level.

The present study examined the perception of mango cultivators and exporters in the District of Malda. But in reality many others, namely, wholesalers, retailers, roadside vendors and food processing firms have not been taken in the purview of our study due to time and resource constraints. As the study focused on major mango producing Blocks of Malda District, all the findings may not be applicable for low mango producing blocks of Malda District. These are some of the *limitations* of our work. Even then, there is no doubt that the findings of the present work may help policy formulation and its fruitful implementation at the local and State levels. We therefore suggest a *few areas* related to mango production in the District of Malda and marketing thereof within and outside the country, for *further research* in this context:

- Similar study with wholesalers, retailers, roadside vendors and food processing firms may be undertaken to ascertain their perceptions which will help policy formulation in local and State levels and their implementation.

- Mangoes are also produced in many other States in India. Is it possible to include one or two mango-producing Districts in other States and compare with the District of Malda in terms management of production and sale of mangoes and suggest some policy implementation for improvement of the scenario so to increase the share of their contribution to the country's GDP.
- Any kind of cost-volume-profit analysis of mango production and marketing could add another significant dimension to a future study of this nature. This is possible with external support in view of the financial background of those connected with production and marketing.

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Influential Factors of Job Stress Associated with Accountancy in Bangladesh: A Multivariate Analysis

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Abstract

The key objective of this study is to identify the determining factors of job stress of accountants. The research was based on quantitative data analysis through a questionnaire survey on 135 accountants of different local companies located in Chittagong, Bangladesh. The study unveiled that, the accountants have significant mental stress caused by role ambiguity, bullying, and time-related work pressure. This study, recommends job redesigning and organizational development interventions to minimize the degree of stress among Accountants.

Keywords: Job stress, Accountants, Stress management, Symptoms of stress, Sources of stress

I. INTRODUCTION

Job is a universal aspect of a person's life and stress related to a job is inevitable. Stress influences individual's work performance and there is a strong association between stress with organizational productivity, profitability, and growth if it is managed with due diligence (Bradley & Sutherland, 1994). Stress may diminish the growth potential and motivation of an employee (Tarkovsky, 2007) and could act as a performance slayer of an enterprise. Occupational stress is the root cause of creating different types of adverse physical, mental, and behavioral symptoms (Table 2) and the employees could be broken low if these signs of stress prevails in his work life. Prolonged job stress may lead to a life-threatening burnout situation and may cause death at work (Ross & Vasantha, 2014; Skogstad *et al.*, 2013). Stress mostly occurs when employees encounter issues of disparity between job

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and personal expectations and remain in mental anxieties of life security issues (Maslach, 2003). Managing stress at the workplace should be given high priority and this issue has become a symbol of best practices in the high performing organizations in the 21st-century.

Accounting is one of the vital components of every business and it is the main guardian of corporate governance (Ahmed, 2006). It has become a very laborious and tedious profession and significant stress is evident in this critical job (Stager, 2017; Moulang & Xiao, 2017). Accounting executives are constantly encountering different stressors (Table 1) and it is the responsibility of both the employer and employees to combat stress intelligently to remain productive. Researches on job stress in the accounting profession are available in the existing literature conducted by Jones III, Norman & Wier (2010); Ozkan & Ozdevecioglu (2013); Dalton, Davis & Viator (2015) and many others. However, there is lack of research in the context of Bangladesh – a rapidly rising country in the world. This study will endeavour to unearth the key determinants of job stress in the accounting profession and will provide possible managerial solutions to those.

II. SIGNIFICANCE OF THE STUDY

The complexity of accounting job demands commitment from the accountants (Clayton & Hutchinson, 2002), and this profession demands a bit more peaceful work-life to remain productive and attentive. As the accounting professionals deal with sensitive data analysis, record-keeping, and auditing of an enterprise, the nature of this job is very exhaustive and stressful. Hence, the physical and mental wellbeing of accountants should be the major concern of every business and it is the sheered responsibility of an employer to keep those people free from stress who deals with numbers (Feehan, 2015). Stress affects individual performance and the studies found that young accountants mostly the females are suffering from acute job stress (Moulang & Xiao, 2017; Collins, 1993). According to White (2019), one out of three accounting professionals are encountering with occupational stress due to work overload, lack of compensation & reward, absence of quality balance of work-life and so on (Accounting WEB, 2010). The statement of Lemmon (2019) shows that only two percent of accountants are out of the effect of job stress.

Stress in accounting professions is inevitable in today's corporate culture of Bangladesh and for the sake of organizational performance; our accountants should be kept free from job stress. Organizations should shoulder the responsibility to identify the sources of job stress and measure its impact on the professional life of the accountants to keep the wheel of organizational performance rotating. This study will make an empirical assessment of the symptoms and sources of job stress of accountants of different business houses based in Chittagong, Bangladesh considering their opinions in this regard.

III. OBJECTIVES OF THE SUDY

- a. To identify the most frequent symptoms of job stress among the accountants.
- b. To grade the sources of job stress according to their impacts on the work-life of the accountants.
- c. To draw a policy framework to manage the stress of this profession.

IV. LITERATURE REVIEW

Stress at work could cause a grievous human disorder in an employee's life which may create a negative impact on productivity and profitability of an organization, society or the nation at large (Huda, 2016). Occupational stress is a state of human life that generates physical, mental, and social infirmity in personal life (World Health Organization, 1948). It causes different types of health problems (Kivimaki *et al.*, 2006) and that negatively impacts organizations by increasing employee turnover, raising absenteeism, poor motivation, and declining productivity (Noblet & Lamontagne, 2006). No profession in the world is free from stress, but extreme levels of stress may affect an employee's performance resulting in gradual demission of organizational prosperity (Teasdale, 2006). If stress is not managed, organizations may face legal allegations for ill-health practice and the workplace may become violent due to employee disorder and disobedience (Babcock, 2009).

Most common causes of stress are friction among the colleagues (Friedman *et al.*, 2000), harassment by the seniors (Gholipour *et al.*, 2011), lack of job insecurity (Kuhnert, Sims & Lahey, 1989), the dearth of freedom, unmanageable family life, inadequate compensation, unachievable deadlines (Huda & Azad, 2015; Babcock, 2009; Major *et al.*, 2002; Tyler, 2006) and long work hours (Uehata, 1991). The extreme outcome of stress may cause heart failure and numerous psychological and behavioral symptoms like allegation towards organization, impoliteness, offensiveness, wickedness, irritation, nervousness, hopelessness, and most commonly declining of confidence (Lee, 2000; Teasdale, 2006) may be visible among the employee. However, employers should regularly audit the stress issues and take necessary measures to decrease the degree of stress at work (Sidle, 2008). Timely stress management may improve the physical and mental status of job stress (Jones, Tanigawa & Weiss, 2003) and may reduce health costs of the organization and facilitate productive workplace behavior (Hardy & Barkham, 1999; Murphy, 1999; Kobayashi, 1997; DeFrank & Cooper, 1987).

Accountancy is a critical but highly demanding profession in global job market (Bloom & Myring, 2008). The job is very stressful for the novice accountants and even the senior accountants are not free from the adverse impact of occupational stress (Gentle, 2017). Due to the changing nature of the 21st-century accounting system, this profession is becoming critical and stressful (Albu *et al.*, 2011; Larson, 2004). Ozkan & Ozdevecioglu (2013); Chen & Silverthorne (2008) have found a negative correlation between job stress and job satisfaction of accountants and established that if the degree of stress increase accountants' job satisfaction will decrease. Business graduates and students of the United Kingdom are little skeptical to take accountancy as a profession. Most of them perceive it as a traditional and boring career (Fisher & Murphy, 1995; Byrne & Willis, 2005). This profession is physically stressful and mentally as well (Stager, 2017). Even the British professional accountants are complaining about job stress and mostly pointing towards work overload issues (Daniels & Guppy, 1995). Kelly & Barrett (2012) had also reported the same in their article and discovered a new stressor of accountancy that is the pressure of obtaining new knowledge. They mainly pointed on the stress of professional examination.

However, Accounting WEB (2010) had reported that 77% of the accounting

professionals are stressed due to long working hours. There is existence stress associated to unclear objective (Collins & Killough, 1992), lack of freedom of choosing assignments or decision making (Larson, 2004), lack of control over work, un-supportive supervisor or lack of feedback (Dalton *et al.*, 2015) and unachievable deadlines (Viator, 2001). Many of them are reporting the stress of time pressure due to the rising number of assignments and they need to work very fast (Gaertner & Ruhe, 1981; Stager, 2017).

Accountants are facing the consequences of burnout due to role conflict and ambiguous expectations of the employer which is compelling them to quit the profession (Fogarty *et al.*, 2000; Senatra, 1980; Viator, 2001; Agarwal & Majupuria, 2010). According to Feehan (2015), 42% want to intend to resign from the job and 40% of the accountants are looking for new jobs. Balancing the work-life is also becoming a new challenge to many accountants (Collins & Killough, 1992; Greenhaus *et al.*, 1997) and the turnover rate of trained and talented accountants is increasing due to this work and family conflict issue (Pasewark & Viator, 2006). Maintaining integrity in this profession is very challenging and very tough to uphold the spirit of accounting ethics (Boyd, 2004; Simms & Zapatero, 2012). According to Perrin (2017), many European employers influence their accountants to comply with their commands and it was also reported that 64% of the accountants are pressurized by the superiors to work against professional ethics. Accountants are often bullied or harassed by their supervisors (Kinder, 2019).

Unseen friction prevails among the male and female accounting professionals of New Zealand as females are subject to many forms of discrimination concerning work hours and career growth (Whiting & Wright, 2001). Hoddinott & Jarratt (1998); Stager, (2017) also reported the same issue of gender discrimination that may lead to interpersonal conflict. According to White (2019), 33% of accountants are stressed by office politics and 29% due to insufficient compensation and reward. They are also stressed by the emerging threat of job security issues due to pay-cuts, layoffs, and reduction of benefits (Tysiac, 2012). According to Sanders, Fulks & Knoblett (1995), Weick (1983) and many other, accounting is a physically stressful profession which is prone to many critical diseases like cardiovascular attack, backbone injury, ulcer, and headaches.

TABLE 1

Different Dimensions and Indicators of Job Stress

	Dimensions of Job Stress (Stressors)	Keyword	Code	Reference
1	Unclear objective	Objective	X1	Collins & Killough (1992)
2	Role is ambiguous	Role	X2	Senatra (1980); Viator (2001); Agarwal & Majupuria (2010)
3	Lack of control over the outcome of work	Control	X3	Dalton et al. (2015)
4	Job is highly influenced by the employer	Influence	X4	Perrin (2017)

	Dimensions of Job Stress (Stressors)	Keyword	Code	Reference
5	Employers' expectation is dilemmatic	Expectation	X5	Fogarty et al.(2000); Senatra (1980); Viator (2001); Agarwal & Majupuria (2010)
6	Massive time pressure	Time	X6	Gaertner & Ruhe (1981); Stager (2017)
7	The pressure of unachievable deadlines	Deadlines	X7	Viator (2001); Turnage & Spielberger (1991)
8	The pressure of working long hours	Long hour	X8	Whiting & Wright (2001); Uehata (1991)
9	Job is overloaded with tasks	Overload	X9	White (2019); Accounting WEB (2010); Agarwal & Majupuria (2010)
10	Work is very fast	Work fast	X10	Gaertner & Ruhe (1981); Stager (2017); Major et al. (2002)
11	Lack of freedom in choosing own assignments	Freedom	X11	Larson (2004)
12	Employers are not supportive	Support	X12	Dalton et al. (2015)
13	Workplace bullying exists in this profession	Bullying	X13	Kinder (2019); Semmer (2007)
14	Friction among the coworker is present	Friction	X14	Hoddinott & Jarratt (1998); Whiting & Wright (2001); Friedman et al. (2000)
15	The pressure of professional development	Development	X15	Kelly & Barrett (2012)
16	Inadequate compensation package	Compensation	X16	White (2019); Major et al. (2002)
17	Unmanageable family life	Family life	X17	Collins & Killough (1992); Greenhaus et al. (1997)
18	Presence of physical stress	Physical	X18	Sanders et al. (1995); Weick (1983)
19	Strong possibility to be affected by the disease	Disease	X19	Sanders et al. (1995); Weick (1983)

	Dimensions of Job Stress (Stressors)	Keyword	Code	Reference
20	Lack of job security	Job security	X20	Tysiac (2012); Semmer, (2007)
21	Difficult to uphold accounting ethics	Ethics	X21	Boyd (2004); Simms & Zapatero (2012); Banerjee (2011)
22	Existence of role conflict	Role conflict	X22	Senatra (1980); Viator (2001)
23	Absence of work-life balance	Work-life	X23	Collins & Killough (1992); Greenhaus et al. (1997)
24	Facing burnout situation	Burnout	X24	Senatra (1980); Viator (2001)
25	Feeling to quit the profession often	Quit	X25	Fogarty et al. (2000); Senatra (1980); Viator (2001)

Source: Literature Review.

There are plenty of studies on job stress in accounting professions in existing pieces of literature and most of the researches made by Fogarty *et al.* (2000); Senatra (1980); Viator (2001); Fisher (2001); Stager (2017); Agarwal & Majupuria (2010) and many more are circling within few dimensions like role conflict and role ambiguity issues and these studies are made long before. However, many important dimensions of job stress are overlooked in those studies, and discovering the symptoms of stress in the accounting profession is very rare. Surprisingly, no researcher has looked at it in the context of Bangladesh. According to the existing literature, there are plenty of stress factors attached to the accountancy profession which generates many symptoms. This study will make an endeavor to fill the gap of previous researches by discovering the fact related to the job stress of this important profession.

V. METHODOLOGY AND SCOPE

The methodology of this study was structured to attain research objectives and it is descriptive which had followed an inductive research approach to complete survey-based research. Both qualitative and quantitative methodologies were blended in this research and a structured questionnaire was used to collect necessary quantitative data. Before that, an extensive literature review was conducted to identify relevant variables (symptoms of stress listed in table 2 and sources of job stress detailed in table 1) which helped to formulate the questionnaire. The survey instruments were distributed among the accounting professionals of different companies of Chittagong, Bangladesh. A total of 160 questionnaires were distributed of which 135 were used for data analysis. We have collected 135 responses on 25 variables and maintained 1:5 data ratio following Stevens (1996) and Bentler & Chou (1987). As the survey was conducted on

corporate managers where large scale data collection is a hard, we maintained 1:5 data ratio. Also, the number of accountants who satisfy our respondent profile is low and therefore we believe 1:5 data ratio can be acceptable for this study.

There were two parts of the questionnaire. To identify the common symptoms of job stress of the accountancy professionals, a multiple-choice based close-ended questionnaire was designed. They were asked to tick on the most frequent symptoms of stress categorized in three classes i.e. Physical, psychological, and behavioral (Table 2). The second part of the questionnaire was used to measure the most influencing sources of job stress (Table 1) and this section contained 25 questions with a 5-point Likert rating scale (5= *Strongly agree* ...1=*Strongly disagree*) to capture the opinion of the respondents. Most of the respondents were with 5-7 years experienced in accountancy. Data analyses were conducted in two stages. At the first stage, the descriptive statistical tool was used to identify the frequency of the most repetitive stress symptoms and higher the percentage indicated the higher-order symptoms. The second stage used a multivariate analysis technique more explicitly the Exploratory Factor Analysis (EFA) using the most popular software SPSS-20 version. EFA was mainly used to identify the most significant sources of job stress and rank them considering the loading value (greater than 0.50) of each variable. Hence, higher loading value was selected as the most significant of the sources of job stress and vice versa.

The respondents were asked questions related to the variables of stress i.e. at what degree they are clear about their job objectives; to what extent they feel the pressure of time, about work overload issues, workplace conflict issues, job security, and so on. The survey was carried out between 1stOctober to 29thNovember 2019.

VI. FINDINGS AND DISCUSSION

Symptoms of stress in accountancy

TABLE 2
Frequency of Stress Symptoms in Accountancy

SL	Physical Symptoms		Mental Symptoms		Behavioral Symptoms	
1	Headaches	44%	Tension	56%	Aggressiveness	28%
2	Migraines	20%	Anxiety	24%	Social isolation	20%
3	Sleep Disruption	22%	Bad Temper	18%	Addiction to drugs	00%
4	Stomach disorders	00%	Low self-esteem	0%	Non-co-operative	30%
5	Blood pressure	02%	Forgetfulness	01%	Negligence in personal appearance	00%
6	Back/shoulder/neck pain	12%	Feeling powerless	01%	Less sociable/friendly	22%

Source: Field Survey.

According to the opinion of the accounting professionals, the most frequent symptom of the physical stress is “headache” (44%). Some reported that they have “sleep disruption” (22%) and “migraine problem” (20%). Few of them reported that they have back pain too (12%). It is a very upsetting fact that about 56% of accountants had marked “tension” as the most psychological/mental symptom of stress followed by feeling of “anxiety” (24%), and becoming “bad-tempered” (18%). As per the statistical results, “behavioral stress” prevails across all types of symptoms. 30% of the respondents reported that they have developed “non-cooperative” attitude due to job stress followed by becoming “aggressive” at work (28%), being “less sociable” (20%) and becoming “socially isolated” (20%).

Most influential sources of job stress

To identify the most influential sources or stressors of accountants, factor analysis was conducted. EFA can describe variability among observed and correlated variables in terms of a potentially lower number of unobserved variables. We checked the normality of data through Kurtosis and Skewness test and found that for our data set the values are 2.21 and 0.39 respectively. Principal Component Analysis through VARIMAX was used primarily on twenty-five (25) explored variables (Table 1). KMO value projecting the degree of data adequacy was found to be 0.805 and therefore the data is adequate for EFA. According to the results, Total Variance Explained (TVE) value is 55%, which is somewhat satisfactory. Hair *et al.* (2016) and Malhotra and Dash (2016) argued that in case of small sized data, a TVE of 50% and above is acceptable considering that the respondent group is hard to reach (in our case the corporate Accountants). The results of rotated factor matrix showed that these 25 variables collectively could explain more than 55% of the total variation of job stress of accounting professionals. A stringent decision was taken to discard the items with loading less than 0.50 or cross-loaded (as suggested by Hair *et al.*, 2016). In addition, communality values for each item were checked too.

At the first stage of EFA, six variables namely “X₄- Influence” “X₅- Expectation” X₁₀ “Work-fast” “X₁₁-Freedom” X₂₀ “Job Security” and X₂₅ “ and Quit-job” are discarded due to low loading and communality values. These variables may not be significantly influential in creating stress among accounting professionals. Principal Component Analysis has grouped the remaining 19 variables into five (5) broad dimensions. The loading and communality values of the remaining significant variables are projecting the extent of influence of each factor and the eigen value and percentage of variation explained of the factors are presented in Table 3. These results present the statistical fact to support the newly identified dimensions of job stress which are coded as F1, F2, F3, F4, and F5 (Table 3).

Variables under Factor 1 are X₁ objective, X₂ role, X₁₇ family-life, X₁₉ Disease, and X₂₂ role conflict respectively. Eigenvalue (4.238) and the percentage of variation explained (16.953) show a moderate degree of influence of those variables in creating job stress. Factor 2 includes five variables explicitly X₆ Time, X₇ Deadlines, X₈ Long hour, X₁₆ Compensation, and X₁₈ Physical with the eigenvalue of 3.221 and 12.885% variation explained. Factor 3 contains three variables, namely X₁₂ Support, X₁₃ Bullying, and X₁₅ Development with the eigenvalue 2.590 and 10.358% of variation explained. This factor may be responsible for causing behavioral and mental stress in the job. Variables namely X₉ Overload, X₁₄ Friction,

and X₂₄ Burnout are clustered in factor 4 with eigen value 2.045 and percentage of Variation Explained 8.181% respectively. Factor 5 contains X₃ Control, X₂₁ Ethics, and X₂₃ Work-life variables with the lowest eigen value and percentage of Variation Explained. This is 1.632 and 6.528 respectively. All the explored variables can generate all sorts of stress symptoms listed in Table 2.

TABLE 3
**Factor Summary: Sources of Stress/Stressors with Loading and
communality Values and Ranks**

Job Stress Factor	Variables	Loading Value	Communality Value	Rank based on loadings	Eigen-value	Percentage of Variation Explained
F1: Role Strain	X1 Objective	.546	.53	16th	4.238	16.953
	X2 Role	.801	.72	1st		
	X17 Family life	.630	.59	11th		
	X19 Disease	.780	.67	3rd		
	X22 Role conflict	.615	.54	13th		
F2: Time and Pay	X6 Time	.715	.64	6th	3.221	12.885
	X7 Deadlines	.745	.66	5th		
	X8 Long hour	.778	.70	4th		
	X16 Compensation	.511	.54	19th		
	X18 Physical	.541	.56	18th		
F3: Organizational Development	X12 Support	.591	.61	14th	2.590	10.358
	X13 Bullying	.800	.71	2nd		
	X15 Development	.678	.68	8th		
F4: Job design	X9 Overload	.542	.53	17th	2.045	8.181
	X14 Friction	.676	.65	9th		
	X24 Burnout	.659	.61	10th		
F5: Job Autonomy	X3 Control	.620	.59	12th	1.632	6.528
	X21 Ethics	.710	.68	7th		
	X23 Work-life	.548	.52	15th		

Source: Compiled from SPSS Version 20.

The study has projected a very comprehensive picture of job stress among the surveyed accounting professionals of Bangladesh. According to the results, headaches and sleep disruption are the most frequent physical outcomes of stress among the Bangladeshi accountants. Hence, tension is the most frequent mental stress which results to non-cooperation with co-workers. After conducting EFA, five broad factors of job stress and 19 pertinent stressors are revealed from the study. The loading value of all the variables is larger than the cut-off value (0.50)

which determines a positive relation with job stress. Two variables namely Role Ambiguity and Bullying at the workplace are highly influential amongst all the explored stressors, as their loading value is more than 0.80.

Six variables namely “X₄- Influence of the employer at work” “X₅- Dilemmatic Expectation of Employer” X₁₀ Work is very fast” “X₁₁-Freedom of Choosing Assignment” X₂₀ “Lack of Job Security” and X₂₅ “Feeling to Quit Profession” are not influential variables of job stress in accountancy as most of the Bangladeshi employees irrespective of professional differences are adopted with the traditional corporate culture which mostly follows “Exploitative Authoritative Management Style”. This means authority takes the decision and imposes it.

Factor 1, which is named “Role Strain”, obtained the highest percentage of variation explained comparing to other factors and this indicates the high probability of influence to cause job stress in the lives of the accountants. In this factor, variable X₂ role ambiguity carries the highest loading value of 0.801 (ranked 1st). This finding has echoed with the research outcome of previous studies made by Fogarty *et al.* (2000); Senatra (1980); Viator (2001) and Agarwal & Majupuria (2010). Accountants of Bangladeshi firms are encountering this stressor as they have to do additional tasks beyond their job description. Most of the respondents shared that they have to play multiple roles or do various tasks apart from pure accounting. They are to meet the clients for the receivable collection, need to deal with sales & marketing people, and visiting factories.

Variable X₁₉ the possibility to be affected by disease stands at 3rd position with a relatively higher loading value of 0.780. As the accounts are experiencing different physical symptoms of job stress (Table 2), they might have apprehended the risk of diseases caused by physical stress. The study also exposed the fact that family-life (X₁₇) of the accountants is unmanageable and the loading value (0.630) is also substantiating the reality. This variable is also ranked at 11th position which forms a lower order stressor. However, variable X₁ unclear objective (0.546; 16th position) and X₂₂ role conflict (0.615; 13th position) are inflaming stress in the lives of the accountants at a moderate level as the loading value is comparatively low to influence the stress situation at a higher degree. However, an immense amount of research has exposed role conflict as one of the significant sources of stress in accounting and many other professions.

Factor 2 is named “Time and Pay” as most of the time-related variables have clustered within it. It covers the time-related variables i.e. X₆ Time pressure (0.715; position 6th), X₇ unachievable deadlines (0.745; position 5th), and X₈ Long work hour (0.778; position 4th) with higher loading value ranging above 0.700. It is obvious that the accountants are envisaging time-related stressors at a higher degree and according to the respondents, such pressure occurs during financial closing periods and at the time of the external audit. Hence, the above situation had also created the X₁₈ physical stress at work (.541; rank 18th) due to its laboriousness. X₁₆ inadequate compensation with comparatively lower loading value is also grouped in this factor (0.511; rank 19th). This relationship is also acceptable as jobholders of this part of the world universally connect their contribution of time and labor with compensation issues. However, findings of this study do not signify physical stress and inadequate compensation issue as highly influential stressors due to poor loading value.

Variable X₁₂ Lack of Support, X₁₃ Bullying by Superiors, and X₁₅ Pressure of

Professional Development are grouped in Factor 3. As most of these variables are associated with organizational behavior and human resources development discipline, the factor is named as “Organizational Development”. It is very alarming that the state of interpersonal relationships is very unpleasant in this profession as “bullying” is ranked in the second position with a high loading value (0.800). However, lack of support from the employers’ end is also moderately prevalent in accountancy which is ranked in 14th position with the loading value 0.591. The pressure of professional development is obvious in accountancy as it demands a higher level of professional development for career progression. Kelly & Barrett (2012) had also reported the same in their research work. According to the experts, most of the accountants of Bangladesh are struggling to pass Chartered Accountancy Course as the syllabus is very vast and the examination is very tough with a low passing rate. Coextending courses like ICMA and ACCA are also of the same nature. That’s why; this variable also scored high with a loading value 0.678 and ranked as 8th influential stressor.

Factor 4 contains three variables that are very commonly found in most professions and such a situation happens due to poor “job design”. These variables are X₉ Work Overload (.542; ranked 17th), X₁₄ Friction with a coworker (0.676; ranked 9th), and X₂₄ Burnout (0.659; ranked 10th). Fogarty *et al.* (2000); Sweeney & Summers (2002); Gray-Stanley & Muramatsu (2011) have also found a strong association between work overload and burnout which may cause conflict among the colleagues. The results of this study (behavioral symptoms of stress Table 2 also complement the result of EFA as 28% of the respondents have opined that symptoms of aggressiveness are present in their behavior and 30% reported that they are non-cooperative.

X₃ Lack of control over the outcome of work (0.620; ranked 12th), X₂₁ Difficult to uphold accounting ethics (0.710; ranked 7th) and X₂₃ Absence of work-life balance (0.548; ranked 15th) have formed factor 5 and it is named as “Job Autonomy “. It is quite evident that accountancy is purely a non-strategic and clerical job and accountants have no personal control over their work. It is strictly guided by the policy and guidelines provided by external authorities. However, sometimes the accountants are compelled to hide financial information by the pressure of the employers and the higher loading value of this item gives the testimony of that. The studies made by Boyd (2004); Simms & Zapatero (2012) somewhat echoed with the outcome of this research findings. According to the results, the accountants a bit failed to take control over their family life though the variable is not that influential and positioned with a low loading value.

VII. MANAGERIAL IMPLICATIONS

It is quite evident that accountancy is a stressful profession in Bangladesh and the world as well. Though the degree of stress among the Bangladeshi accountants is in a manageable condition, the presence of some stressors like bullying and ethical matters is quite unpleasant and these stressors should be managed with due diligence. Stress regard to role issues is pretty common in all professions but this could be minimized by redesigning the job. Behavioral stress issues like bullying and accounting ethics could be addressed by initiating a wide range of organizational development programs and also following the techniques of

quality of work life. Leadership development, mentoring, and supervisory training should be emphasized in this regard. A combined initiative could be taken by the organizations in association with professional bodies like Institute of Cost and Management Accountants of Bangladesh (ICMAB) and Institute of Chartered Accountants of Bangladesh (ICAB) to institutionalize stress management policies and practice. Accounting departments of different organizations are advised to conduct regular stress audit and initiate stress management interventions as per the result of the audit. Time and pay issues should be addressed seriously and professional development matters should be formalized under the direct supervision and support of the human resource department of the organization.

The world is passing a very critical time due to the devastation of COVID 19 and its impact on the global economy would be larger than that. The post-corona economic downturn may paralyze the socioeconomic order of many developing countries like Bangladesh. To revive our economic ecosystem from this terrible depression, the businesses must refurbish its policies, practices, and the corporate culture. Job stress impedes the productivity and profitability of an enterprise which may lead to suffer an organization in the long run. Though the Bangladeshi organizations are not encountering employee turnover issues due to the dominance of the high unemployment rate, they must address job stress seriously to retain the talented and professional accountants. Stress management is a very popular employee retention strategy and to free the accountants from the curse of job stress the employers may consider the results and recommendations of this study to make our business sustainable.

VIII. CONCLUSION AND DIRECTION FOR FURTHER RESEARCH

In order to minimize the gaps of existing literature, this study offers 19 items and 5 dimensional model of stress for accounting professionals. It is quite evident from the results of the study that there are plenty of stress factors attached to the accountancy profession which also generates many symptoms of stress. This study had identified the key determining factors of job stress i.e. role ambiguity, bullying, and time-related work pressure of accountants of Bangladesh and results of this study supports the studies conducted in India by many researchers like Agarwal & Majupuria (2010) and Banerjee (2011). The study recommends job redesign strategy and organizational development interventions to minimize the impact of stressors on the work-life of the accountants. Hence, no study is ideal and *limitation* of a research work opens a new opportunity for further investigation. Inadequate sample size could be a visible limitation of this research work and tools used for statistical analysis may limit the possibility to draw a perfect conclusion. However, researchers may carry it forward by taking a larger sample size and consider confirmatory factor analysis as a statistical tool to be flawless in testing the outcome of the research. There is an opportunity for analyzing the impact of stress on the productivity of accounting professionals and how does it affect the performance of an organization. Researchers may narrow their scope of study in an industry context and may select economically significant sectors like RMG, and Steel in this regard.

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FIFTEENTH INTERNATIONAL ACCOUNTING CONFERENCE

January 9th & 10th, 2021 (Saturday & Sunday)
Science City Auditorium¹, Kolkata-700 046

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Research-based papers on the following topics are invited for presentation at the Conference:

- Accounting and finance in digital age
- Accounting as a tool of decision science for Value Optimization for new age Corporations
- Artificial intelligence in accounting and finance
- Audit risk in digital environment
- Future of accounting and finance
- Issues in Behavioural Finance
- Accounting for MSMEs

¹Confirmation awaited.

- CSR accounting and reporting
- Corporate governance and profitability
- Sustainability Practices of Micro-entrepreneurs
- Collection of Revenue and Enforcement of Tax Laws
- COVID 19 and Challenges before the Accountants.
- Impact of COVID 19 on different Sectors of the Economy, e.g., SMEs, Travel and Tourism, Capital market, Education, etc.
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Submission Guidelines

- (1) Two hard copies and one soft copy of the paper should be submitted. The text of the paper will be in double space, 12 font, Times New Roman, keeping a margin of one inch in three sides. MS Word (.doc format) is required. Each paper should be preferably within 5000 words including tables and references, in addition, **an abstract** of not more than 500 words in a separate page.
- (2) There should be a **separate title page** on each paper giving details of author/s, affiliation, address, telephone numbers and e-mail.
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- (5) Papers must be submitted within **September 30, 2020**.
- (6) Notification about the acceptance or otherwise of a paper will be made by **November 30, 2020**.
- (7) Papers submitted for presentation will be subject to blind review and the decision of the Scientific Committee will be final.

NAMITA BANERJEE BEST PAPER MEMORIAL AWARDS

The **best two papers** will each be awarded ₹2500/- (Rupees two thousand five hundred only) to be selected by a panel of distinguished reviewers. Research papers submitted by the Delegates from SAARC countries within the age limit of 40 years will be considered for the purpose.

REGISTRATION FEES

(For delegates from India and other SAARC Countries)

	For payment on or before <u>December 09, 2020</u>	For payment after <u>December 09, 2020</u>
Member of IAARF / IAA	₹ 2500	₹ 3000
Non-member	₹ 3000	₹ 3500
Corporate	₹ 4000	₹ 4500

- **Deadline for Registration: December 20, 2020 (no spot registration).**
- Accommodation Charges for delegates from outside West Bengal only (for 3 nights, i.e., January 08, 09 & 10): **₹ 2000 per delegate on a double**

occupancy basis.

(*Only a few rooms at State Guest House, International Guest House of Ramakrishna Mission, Gol Park, etc. will be available on a first come, first served basis.)

- Registration fees will cover 3 breakfasts, 2 luncheons, 2 dinners, copy of Conference Proceedings and transport facilities within the city (for attending Conference only).

In December–January, the weather in Kolkata is pleasant, with temperature varying between 12°C and 22°C. There are many beautiful places and monuments of tourist attraction in the City. Popularly known as the Cultural Capital of India, the City is famous for the warm hospitality of Kolkatans. Kolkata is well connected by air (Netaji Subhas Chandra Bose International Airport) and rail (Howrah Station, Shalimar Station, Sealdah Station and Kolkata Station).

PARTICIPANTS

Distinguished academics and practitioners from different parts of the world are expected to attend the Conference. Besides, members of the IAA Research Foundation, representatives of Deloitte, members of Indian Accounting Association (IAA) and its key office-bearers, academic heads and deans of many reputed business schools and universities in India, representatives of three professional bodies, viz., the Institute of Chartered Accountants of India, the Institute of Cost Accountants of India and the Institute of Company Secretaries of India, will grace the occasion by their kind presence and active participation in different sessions. About 225 delegates are expected to attend the Conference.

BRIEF PROGRAMME

On 9th January, 2021, at the inaugural session, the Vice-Chancellor / Pro-Vice Chancellor (Academic), University of Calcutta, one of the past Presidents of the American Accounting Association, Present and Past Presidents of Indian Accounting Association, and Chairman, Deloitte India, are expected to grace the occasion among others. In the First Plenary Session, Professor Shyam Sunder, Yale School of Management, and past President of American Accounting Association, USA, will give the keynote address on a contemporary issue and there will be Concurrent Sessions on different business topics in the post-lunch session. On 10th the Conference will be resumed with Concurrent Sessions followed by post-lunch Plenary Sessions. Valedictory Address is expected to be delivered by Professor Arup SenGupta of Lehigh University, Pennsylvania, USA. There will be many more distinguished academics and professionals (from India and abroad) who will either chair a concurrent session or speak in a Plenary Session. Interested participants may visit the Foundation's website (www.iaarf.in) from time to time for updated information in this respect.

Some of the Eminent Scholars/Professionals who attended the previous conferences

- Professor Stephen A.Zeff, Past President, AAA, Rice University, USA
- Professor Sidney J. Gray, Professor of International Business and Co-Director of the Entrepreneurship and Innovation Research Group at the University of Sydney Business School. The University of Sydney

- Prof. Kazuo Hiramatsu, Past President, JAA (Kwansei Gakuin University) and Past President International Association for Accounting Education and Research (IAARF)
- Donna L. Street, Past President, IAAER (University of Dayton)
- Professor Andrew D. Bailey, Past President, AAA, University of Illinois at Urbana Champaign
- Professor Stefano Zambon, Italy (10th Conference)
- Professor Belvered E. Needles, Jr., DePaul University, Chicago
- Professor Tony Kang, Member, AAA(USA)
- Professor Shyam Sunder, Past President, AAA (Yale School of Management)
- Professor Rajendra P. Srivastava, The University of Kansas, USA
- Professor Bruce K. Behn, Past President, AAA (Deloitte LLP Professor, The University of Tennessee)
- Professor Bikki Jaggi, Former Chair, Rutgers University, New Brunswick, USA
- Professor S. Gupta, Former Chair, Department of Accounting, Lehigh University, USA
- CA P. R. Ramesh, Chairman, Deloitte India
- CA Dipankar Chatterjee, Partner L.B.Jha & Co.
- Professor Asis Kumar Banerjee, Former Vice-Chancellor, University of Calcutta
- CMA Souren Dutt, Director of Finance, Damodar Valley Corporation of India
- Dr. Bhaskar Banerjee, Chairman, The Calcutta Stock Exchange Ltd.

**CONTACT PERSONS FOR SENDING QUERIES,
PAPERS, REGISTRATION OF INTEREST**

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ASIAN-PACIFIC CONFERENCE
ON INTERNATIONAL ACCOUNTING ISSUES

**32nd Asian-Pacific Conference on
International Accounting Issues
Wellington, New Zealand**

October 10-13, 2021

Proudly co-hosted by:
School of Accounting and Commercial Law
Victoria University of Wellington
and
Asian-Pacific Conference on International Accounting Issues

CALL FOR PAPERS

www.apconference.org

The Thirty-Second Asian-Pacific Conference on International Accounting Issues will be held from October 10-13, 2021, in Wellington, New Zealand. The theme of the Conference is **Accounting: Maintaining Relevance in a Digital Age**. The Conference will provide an important forum for the interaction of different ideas and information between academicians and practitioners, in order to enhance the understanding of international accounting and business issues in various countries. In addition, there will be PhD Symposium for both academics and Ph.D. students.

All submissions must be received by May 16, 2021. Notification about the decision will be made by June 15, 2021. For submission requirements and instructions, please visit the Conference website at www.apconference.org

VERNON ZIMMERMAN BEST PAPER AWARDS

The best Three papers will each be awarded US\$500, to be selected by a panel of distinguished reviewers. In addition, the best doctoral student paper will also be awarded US\$500.

PUBLICATIONS

The conference is partnering with four journals for possible publication of papers presented at the Conference.

China Accounting and Finance Review (CAFR)

The Editors of China Accounting and Finance Review (CAFR) offer, for a small number of outstanding papers submitted for presentation at the Conference, an award of financial support for conference attendance (a range of \$300 to \$1500 USD per person plus registration fee) and publication in CAFR. If you are interested in having your paper considered for this award, please indicate this when submitting

your paper. CAFR publishes papers on issues related to China as well as outside China. It publishes full research papers, literature reviews, comparability studies (for example, replication of a US study for emerging countries) and short articles (Knowledge Transfer Forum).

Australian Accounting Review (AAR)

The Editors of Australian Accounting Review (AAR) invite presenters of papers at the conference to submit, post the conference, their paper for publication in AAR. Normal criteria for publication will apply but conference papers will receive a fast track review. If there are a sufficient number of papers, the Editors will consider producing a special issue for the papers from the conference. The scope of AAR is accounting professional practice and it includes articles on audit and assurance, communication and information systems, ethics and governance, financial reporting, management accounting, taxation, and treasury practices.

Accounting Research Journal (ARJ)

The Editors of Accounting Research Journal (ARJ) invite presenters of papers at the conference to submit, post the conference, their paper for publication in ARJ. Normal criteria for publication will apply but conference papers will receive a fast track review. If there are a sufficient number of papers the Editors will consider producing a special issue for the papers from the conference. ARJ embraces a range of methodological approaches in identifying and solving significant emergent problems and accounting issues. Submissions are encouraged across all areas in accounting, finance and cognate disciplines.

International Journal of Business (IJB)

The Editors of the International Journal of Business (IJB) offer, for 5-6 outstanding papers submitted for presentation at the conference, publication opportunities in their journal. All accepted papers at the 32nd Asian-Pacific Conference will be eligible for consideration.

CONTINUING PROFESSIONAL EDUCATION CREDITS

Participants in past Conferences have earned up to 16 hours of CPE credits.

CONFERENCE REGISTRATION FEE

General Registration: \$700 NZD

PhD Student Registration: \$300 NZD (Dinner is not included)

For PhD student(s) to attend the Gala Dinner: \$150 NZD

Registration fee includes:

The general registration includes: Welcome Reception, Luncheons, Gala Dinner, Coffee Breaks, a copy of the Conference Program, a digital copy of the Conference Program and Proceedings, and Admission to all Conference Sessions

The PhD student registration includes: PhD Symposium, Welcome Reception, Luncheons, Coffee Breaks, a copy of the Conference Program, a digital copy of the Conference Program and Proceedings, and Admission to all Conference Sessions. The student registration does not include the Gala dinner.

CONFERENCE ACCOMMODATIONS

There are 3 hotels close to the Conference venue as follows:

1. Bolton Hotel – Cnr Bolton and Mowbray Street, Wellington
2. Rydges – 75 Featherston Street, Wellington
3. Sofitel – 11 Bolton Street, Wellington

FOR MORE INFORMATION, PLEASE CONTACT:

Dr. Ali Peyvandi, Conference Chairman, info@apconference.org

Dr. Susan Henderson, Vice Chair, info@apconference.org

Crystal Cui, info@apconference.org

Tel: +1.559.278.2602 or +1.559.278.4723

CONFERENCE CO-ORGANIZER:

Prof. Tony van Zijl and Rebekah Sage, apciai202@vuw.ac.nz

Tel: +64 4 463 5775

Obituary/Condolence

Professor (Dr.) Pares Nath Chattopadhyay, a life member of IAA Research Foundation and a Recipient of Outstanding Researcher Award during 2012-13 from the Foundation, passed away on 21st May, 2020, at 8.40 p.m. at the age of 91+.

Dr. Chattopadhyay had a long academic career starting with the erstwhile Institute of Cost Accountants of India (Director of Research) and then moving to the Department of Business Administration, University of Burdwan (as Professor) from where he retired. In between, he had worked for a brief period as a Visiting Professor in the Department of Commerce, University of North Bengal. He also worked for some time as a Guest Faculty of the Department of Commerce, University of Calcutta.

Dr. Chattopadhyay was a prolific writer and an erudite scholar. Among numerous research articles and books, was included a research volume entitled Corporate Mis-Governance, funded by the IAA Research Foundation. That research volume was first of its kind in the sub-continent.

In national and International Conferences organised by the IAA Research Foundation, he was almost a regular Speaker/Chairperson and was undoubtedly a “darling” of the delegates. In his death, a void is created which will never be fulfilled.

His death is a great loss to the members of his loving family, members of the Foundation in particular and to the Society in general.

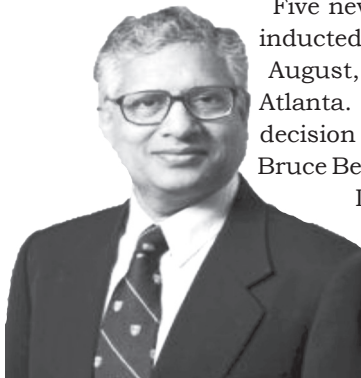
The Foundation, on behalf of its members, condole the sad demise of Dr. Chattopadhyay and pray for peace of the departed soul in heavenly abode.

For and on behalf of IAA Research Foundation

June 30, 2020

Dr. Dhrubaranjan Dandapat
Hony. Secretary

Congratulations to Professor Shyam Sunder for being one of the Inductees (2020) to The Accounting Hall of Fame of the American Accounting Association



Five new members of the Accounting Hall of Fame¹ will be inducted by the American Accounting Association (AAA) in August, 2020 during AAA's Annual Meeting in Atlanta. Professor (Dr.) Shyam Sunder is one of them. The decision was taken by a Committee chaired by Professor Bruce Behn, Past President of AAA

Dr. Shyam Sunder is the James L. Frank Professor of Accounting, Economics, and Finance at the Yale School of Management and Professor (by courtesy) in the Department of Economics. He is a renowned accounting theorist and experimental economist. His research contributions to accounting include financial reporting, information in security markets, statistical theory of valuation, social norms and regulation. He is a pioneer in the fields of experimental finance and experimental macroeconomics. Sunder's research includes ten books and more than 220 articles in the leading journals of accounting, economics and finance, as well as in popular media. His monograph, *Theory of Accounting and Control* (1997), has been translated into Chinese, Japanese, Korean, Portuguese, and Spanish. He and his research have been awarded multiple honours including the AAA/PricewaterhouseCoopers Foundation Outstanding Accounting Educator Award (2013), the AAA Distinguished International Lecturer (2000) and the AAA Presidential Research Lecturer (1999). He is a two-time Recipient of the AAA/AICPA Notable Contributions to Accounting Literature Award (1982, 1998) and a Recipient of the Competitive Manuscript Award (1975). He is a past President (2006-2007) and Director of Research (1988-1990) of the AAA (www.aaahq.org/AHOF).

Shyam Sunder was born in 1945 to Murari Lal and Yashoda Devi in Dankaur in Greater Noida district of Uttar Pradesh. He was educated at Bihari Lal College in Dankaur (high school), Government Inter College in Bulandshahr (intermediate), Indian Institute of Technology at Kharagpur and Indian Railways Institute of Mechanical and Electrical Engineering at Jamalpur in Bihar. After working for the Indian Railways, he completed his masters and doctoral education at Carnegie

¹The Accounting Hall of Fame of the American Accounting Association honours Accountants who have made, or are making, significant contributions to the advancement of accounting since the beginning of the 20th Century. Since its establishment in 1950, 101 leading Accountants have been elected to the Hall of Fame.

Mellon University. He taught at the University of Chicago, University of Minnesota, and Carnegie Mellon University before joining Yale University in 1999.

Professor Sunder is also connected with many reputable organizations in India. As a frequent visitor, speaker, teacher, and advisor to Indian universities, he has been promoting accounting education and research in India. The Indian Accounting Association Research Foundation has been fortunate enough in keeping academic relation with Prof. Sunder from its inception. He has been participating in various programmes of the Research Foundation from time to time since 2006-07. At present, he is one of the **Consulting Editors of Indian Accounting Review** in which he had already published a number of thought-provoking research articles.

The members of the Indian Accounting Association (IAA) Research Foundation are honoured to congratulate Professor (Dr.) Shyam Sunder on his rare achievement of being inducted to The Accounting Hall of Fame of the AAA. Let his contributions to the cause of accounting education and research in India continue as before.

June 30, 2020

For & on behalf of IAA Research
Foundation
Dr. Dhrubaranjan Dandapat
Hony. Secretary

INDIAN ACCOUNTING REVIEW

Statement of Policy, Requirements & Guidelines

Policy

Indian Accounting Review (IAR) is a bi-annual research journal published by the Indian Accounting Association Research Foundation. It is published in June and December each year. It is a refereed international journal with the review process being double blind. The scope of the journal encompasses all areas of accounting including auditing, taxation, management accounting and information systems. IAR seeks to publish high quality, research-oriented and original articles. It encourages both fundamental and applied research works.

Submission requirements

Two copies of manuscripts along with a C.D, should be submitted for consideration for publication in IAR. Manuscripts from abroad should be accompanied by a US \$100 non-refundable submission fee payable by cheque in favour of 'IAA Research Foundation'. For authors from SAARC countries, non-refundable submission fee is ₹ 800 but for each published article, ₹ 1,500 will be awarded.

All manuscript should be typed one and half-spaced. A separate list of references should be used, not made a part of the footnotes. Footnotes, also one and half spaced, should be listed at the end of the paper. **Manuscripts should not normally exceed 20 pages** including figures, tables, footnotes and references, printed on 8.5" x 11" paper.

Each manuscript should contain a non-mathematical abstract of not more than 100 words. There should be a title page containing the name of the article, authors' names (without designations), affiliations and corresponding author's address. The names of the authors should not appear on the first page of the manuscript to facilitate blind review. **Manuscripts must be prepared strictly following the guidelines.**

The submission of a manuscript to IAR means that the author certifies that the manuscript is not copyrighted, nor has it been accepted for publication (or published) by any refereed journal; nor is it being submitted elsewhere, at the same time.

Manuscript-preparation guidelines

The following guidelines should be followed.

Heading : Bold, centred and 14 point. Each word should start with a capital letter.

Author Name : Centred 12 point, with affiliation below the name in 10 point but no designation,

Abstract : Indented from both sides in 10 point.

Headings : Bold, upper case only centred in 12 point.

Sub-headings : Bold, upper-lowers, 10 point, from left margin.

Text : In 12 point and there should be one-inch margins on all four sides.

Tables and Figures : Table in capital and centred in 10 point, and the table description in bold, upper lower 12 point.

For further details see Journal Section of the Foundation's Website (www.iaarf.in).

References: Samples:

- (i) **Book** : Choi, F.D.S., Frost, C.A. & Meek, O.K. (1999). *International Accounting*, Upper Saddle River, N.J.: Prentice Hall, 24-31.
- (ii) **Journal** : Rivera, J.M. (1991). Prediction performance of earnings forecasts : the case of U.S. multinationals. *Journal of International Business*, 22, 265-288.

Submission address :

Manuscripts from the U.S.A., Canada, Mexico, South-American and European countries should be submitted to : **Professor Shyam Sunder**, Yale School of Management, Connecticut, USA.

Email: shyam.sunder@yale.edu

Manuscripts from other countries should be submitted to : **Professor Dhrubaranjan Dandapat**, Editor IAR, Department of Commerce, University of Calcutta, Kolkata - 700 073.

Email : dhrubacal@yahoo.co.in / drdcaluniv@gmail.com

INDIAN ACCOUNTING REVIEW

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