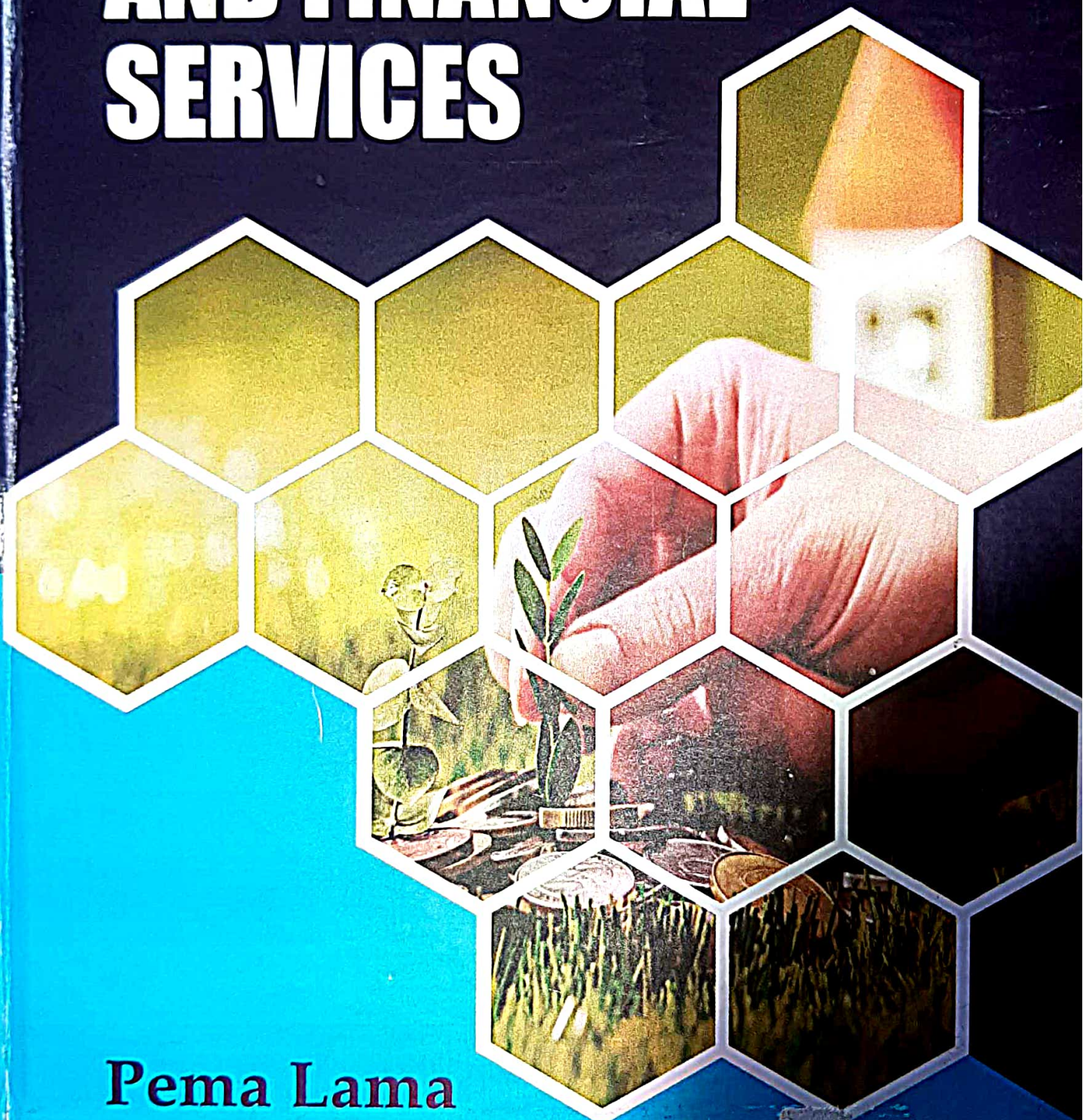


Emerging Issues in
BANKING, INSURANCE
AND FINANCIAL
SERVICES



Pema Lama
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**BANKING, INSURANCE
AND FINANCIAL SERVICES**

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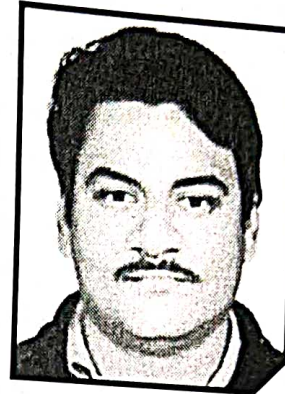
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A Study on the Progress of Bitcoin Crypto Currency and Its Scopes and Challenges



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ABSTRACT

Since the inception of Bitcoin, it has been able to manage a significant progress in short span of time. The volatile progress of Bitcoin is in a pick time now. Consideration of Bitcoin has not been welcomed yet in all the countries of the world. But, in the financial market its visibility and uses are very much seen. This is a very interesting issue, where a substitute currency emerging and running parallel without proper support of government. Considering this issue in the financial market, present study has tried to narrate the progress of Bitcoin currency. Not so many studies can be found in this area or topic. Previous studies have emphasized on the progress and volatility and on some selected factors influencing Bitcoin performance. Here, data are taken from January, 2015 to November, 2020 of different web sites as needed. Level one ARCH model is formed and it has been found that the regression coefficient of gold and crude oil price have significantly negative relationship with Bitcoin price. A considerable increasing trend is also found in the volume of Bitcoin transaction. This is showing that Bitcoin may be a significant rival against other currencies. Government should consider this early in its policy formulation. The negative impact like bubble effect may also expected if not controlled it properly in time.

Keywords: *Crypto Currency, Bitcoin, Capital Market*

I. INTRODUCTION

Considering the uses and limitations of traditional currencies, digitisation of currencies has been initiated by the different governments in the world economy. But, limitations still exists in that digital currencies as

these are backed by those traditional currencies. To nullify those limitations and to transfer the currency power from government to private parties digitization of currencies evolves a step forward into crypto currency. Even if there are some specific limitations to use crypto currency, but within a decade of its formation, it is able to put a considerable footprint in the financial market of all over the world. The uses of crypto currencies are legal in most of the developed countries. There are several developing countries including India and China, where these currencies are allowed at a restricted level. These currencies are illegal in most of the Middle East countries. Although, the legal consideration of crypto currencies by all the government are at uncertain stage, the transaction and acceptance of crypto currencies are significantly increasing over the period. This has been accepted in retail, e-commerce and physical goods transaction in addition to the capital market.

Considering the acceptability and progress of crypto currencies in the different transactions and financial market, the present paper is prepared to re-present the progress of crypto currency in the form of Bitcoin and few selective issues in relation to that. For that purpose, the paper is sectionalised in the following way. After the brief introduction in first section, second is used for literature review. The objective of the study is stated in third, methodology in fourth and findings are described in section fifth and conclusion is given in section sixth.

II. LITERATURE REVIEW

Because of its recent popularities, several literatures can be found on this topic. This can be seen from the sharp rise in the newspaper articles on Bitcoin and Google search made on the Bitcoin. But, studies to relate Bitcoin with the base of all currencies like Gold and Crude Oil prices, cannot be found that much. Considering the space and time limitation for this paper, some of the literatures are reviewed on the Bitcoin and any other variables relationship.

Nathalie et. al. (2014) have reviewed academic literature and economic theories, as well as public news helped to identify the variables related to the Bitcoin price and performance. Some of them are information demand, trade volume, world market index and trend. The variables fitted to the Bitcoin volatility registered for the sample period and is able thereby able to show, how the variables affect the Bitcoin volatility. The test result suggests that five of the ten variables are significant on a 5 % level. More specifically it suggests that information demand is a significant variable with a positive influence on the Bitcoin volatility. Kristoufek (2015) have studied on the main drivers of Bitcoin price. Here, Bitcoin price index, blockchain, search engine, financial stress index and gold price has been considered. There are several interesting findings. as the Bitcoin is usually considered a purely speculative asset and it is also found that standard fundamental factors-usage in trade, money supply and price level- play a function in Bitcoin price. Polasik (2015) has discovered that Bitcoin returns are driven primarily by its recognition, the response articulated in newspaper reports, and total number of transactions in search engine on crypto currency. The paper also reports that how country, customer and company-specific characteristics work together with the sales accredited to Bitcoin. We find that company features, use of other payment methods, customers' knowledge about

Bitcoin, as well as the size of both the official and unauthorized financial system are significant determinants. DeVries (2016) narrated that the Bitcoin, the first and most popular cryptocurrency, is paving the way as a disruptive technology to long standing and unchanged financial payment systems that have been in place for many decades. While crypto currencies are not likely to replace conventional currency, but clearing away barriers surrounding to national currencies and exchange rates. Crypto currencies may transform digital trade markets by creating a free flowing trading system without fees. In the Thesis paper Zmaznev (2017) has narrated the evolution of Bitcoin and Ethereum from macro-economic perspectives. Bitcoin started with the price of approximately 1 cent per unit in 2009, and on January, 2018 it is 11000 USD. Recent years have shown a severe boost in crypto currencies. Therefore, till date different scholars are having different opinions and findings on the relationship of Bitcoin price and performances. Scholars opinions can be seen regarding the variables influencing Bitcoin price. On this issue, studies on the relationship of vital price elements like gold and crude oil price are really scanty. Considering one of the biggest open market in the world economy the relationship of traditional price deciders and Bitcoin is necessary. Thus, on this backdrop, the objective of the present study has been decided and mentioned in the next section.

III. OBJECTIVE OF THE STUDY

The objective of the present paper is to form a model, which may represent the relationship between Bitcoin price and other vital price influencing elements like Crude Oil, Gold price in a possible simplified way.

IV. RESEARCH DESIGN

Research Methodology: On the basic of secondary data collected from the respective sources, correlation and time series regression analysis are made to understand relationships among the specified variables mentioned in the following sub-sections.

The next sub-sections consist of sample selection, defining the variables, forming hypothesis, specifying statistical tools and regression model formation.

Sample: The sample has been considered on and from first January, 2015 to November, 2020. Bitcoin price, Crude Oil prices, Gold Price are taken in USD in addition to the NASDAQ and BSE Sensex market index are taken for analysis. These are taken on weekly basis. The NASDAQ and BSE Sensex are taken as control variable. Although, BSE Index may be rejected, but Indian market has more potential to absorb international issues. So, it has been considered in that respect. A total of 311 data are found from the respective web sites.

Variables: The variable are indicated and calculated in the following ways:

BTP: It is indicating Bitcoin price in terms of USD.

BSE: This is Bombay Stock Exchange sensitivity index and taken from BSE website.

COP: It is the weekly average price of Crude Oil.

NAS: It is weekly average value of NASDAQ Composite Index.

GOP: It is weekly average price of gold in USD.

Hypothesis: Considering the objective of the study, it has been hypothesized that price and transaction volume has outperformed other variables under consideration and significant influence can be found by the variables under consideration. In another way,

Null Hypothesis H_0 : There is no relation and reflexion of GOP, COP on the BTP.

Alternative Hypothesis H_1 : BTP is related significantly with GOP and COP either negatively or positively.

Tools: Simple descriptive statistics like mean, standard deviation etc. are calculated first. The bi-variate correlation is formed among the market indexes and petrol price. Stationarity of data are also tested. Regression model is formed to understand the variables under consideration.

Model: The available data are tested regarding the existence of unit root. Considering the availability of unit root in the market indexes, the ARCH model of level one is calculated by the following equation:

$$LBTP = \alpha + \alpha_1 LCOP + \alpha_2 LGOP + \alpha_3 LNAS + \alpha_4 LBSE + \varepsilon \text{ --- (1)}$$

In the next section, this model has been explained with the results by using STATA.

V. FINDINGS

The raw data are presented here in the Table I with the descriptive statistical results. The Table I is showing maximum, minimum, average and standard deviation (SD) statistics values of the selected variables. Besides the previously described variables, week end transaction volume of those selected variables are also included here.

Table I: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
BTP	201.90	18965.47	5016.01	4543.26
COP	14.63	74.67	50.83	10.72
GOP	1062.45	1997.25	1345.51	212.51
NAS	4376.44	12354.10	6915.47	1901.98
BSE	23312.70	46049.22	32643.85	5266.77
BTV	109488700.00	367606000000.00	64613226615.04	85854855678.91
COV	895058.00	62483603.00	2956183.38	3621666.31
GOV	17.00	84152285.00	1305055.93	7639798.91
NAV	4254010000.00	29200550000.00	11148746463.02	4081204259.61
BSV	19800.00	78478500.00	1090858.52	7154441.84
N=311				

Source: Authors' Calculation (Data from Finance.yahoo.com)

The Table I the BTP amount increased to the maximum of \$18965 from \$202 with 928 thousand percent. Naturally, the SD is significantly high (4543), which is indicating BTP's high volatility. Comparatively lower volatility (i.e. SD) can be found against COP (10.72) and GOP (212.51). Beside this results, a comparison of BTV and NAV volatility showing that BTV is very higher than NAV. The average value of BTV is also higher than NAV. It is showing that in several situations the BTP and BTV outperform COP, GOP and NAV respectively. The correlation table is presented next and narrated accordingly.

Table II: Correlation

	Spearman		Pearson		Kendall	
N=311	rho	sig	r	sig	tau	sig
BTP-COP	0.25	0.000	0.19	0.001	0.19	0.000
BTP-GOP	0.77	0.000	0.71	0.000	0.57	0.000
BTP-NAS	0.90	0.000	0.87	0.000	0.74	0.000
BTP-BSE	0.82	0.000	0.82	0.000	0.60	0.000
BTV-COV	0.26	0.000	0.18	0.001	0.19	0.000
BTV-GOV	0.51	0.000	0.16	0.004	0.34	0.000
BTV-NAV	0.55	0.000	0.67	0.000	0.39	0.000
BTV-BSV	0.47	0.000	-0.04	0.462	-0.03	0.542

Source: Authors' Calculation (Data from Finance.yahoo.com)

In the Table II bi-variate correlation is shown only for BTP and BTV. All three types of correlations values are calculated for better findings. Here, it can be seen that BTP has significant positive relationship with COP, GOP, NAS and BSE. Whereas, except BTV and BSV insignificant relationship, COV, GOV and NAV have positive significant relationship. The insignificant relationship may be representing that the Indian stock market is yet to be significantly influenced by the Bitcoin market. It may be due to the partial restrictions imposed by the Indian government. Overall, Bitcoin price and volume are performing equally with other selected financial market variables.

Following Table II, the Table III has been formed where comparison is made to show the existence of crude oil and gold price and index values, which are significantly differing from Bitcoin price. Table-3 is clearly showing the 't' value at p<1% of different pairs. Here, it is clear that all the dependent variables mean values are significantly differing from Bitcoin price.

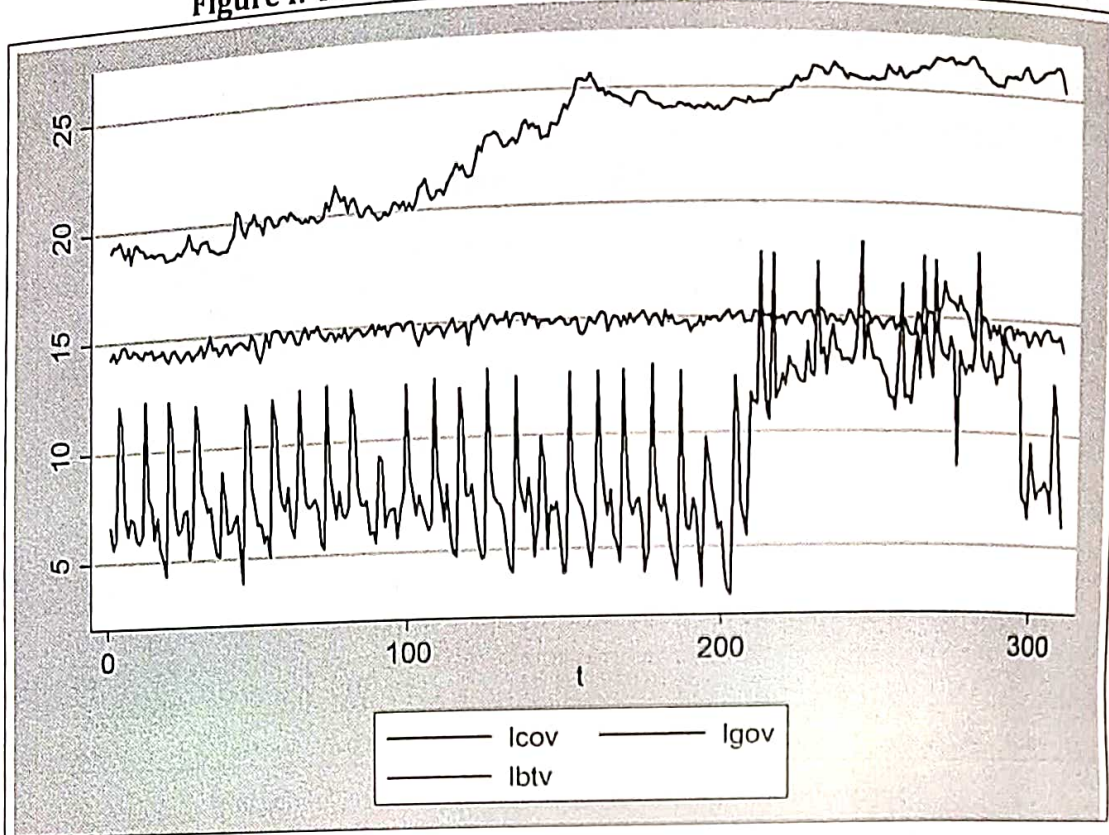
Table III: Paired t-test of Mean Value

		t	df	Sig. (2-tailed)
Pair 1	BTP-COP	13.272	310	0.000
Pair 2	BTP-GOP	13.272	310	0.000
Pair 3	BTP-NAS	11.337	310	0.000
Pair 4	BTP-BSE	13.272	310	0.000

Source: Authors' Calculation

Relating to the Table III, the prices are shown in a graph to show the trends of prices for comparison.

Figure I: Trend of Crude Oil, Gold and Bitcoin Price



Source: Authors' Calculation (Data from Finance.yahoo.com)

Considering Equation-1 (Eq-1), there are different variables, which are measured in USD and Index. Before, getting the regression result, it is necessary to test the data about the existence of non-stationary nature. To check non-stationary, the Augmented Dickey-Fuller test is applied to find out the availability of unit root in the selected variables. Except GOP, other variable are having unit root. Therefore at initial level, those variables are converted into natural log value. In addition to the log conversion it has found that normal linier (OLS) regression model is not useful due to unit root existence. Thus, an ARCH model with different level can be formed. The ARCH model at level one is having significant test statistics 4.37 at $p < 1\%$, but at level two and three the test statistics values are insignificant at $p > 10\%$.

Considering the above results, ARCH model is shown below at level one. Following the Equation-1 it is found that the ARCH at L(1) Wald χ^2 is 12987.58 at $p < 1\%$.

$$LBTP = -28.6721 - 0.6309 LCOP - 2.2733 LGOP + 4.5338 LNAS + 1.5366 LBSE \quad \text{---} \\ \text{---(2)}$$

$$LBTP = -28.6721 - 0.6309 LCOP - 2.2733 LGOP + 4.5338 LNAS + 1.5366 LBSE \quad \text{---} \\ \text{---(2)}$$

SE	(1.5985)	(0.0702)	(0.1707)	(0.1778)	(0.2371)
p	0.000	0.000	0.000	0.000	0.000

From Equ.-2 it can be seen that the coefficient values are significant at $p < 1\%$ and the value of standard errors are below one. This is showing that the relationship of independent variables with the dependent variable BTP. Notable is that the coefficients of COP (0.6309) and GOP (2.2733) are significant and negative, in comparison to other control variables. These results show that the selected variables are significantly related to the BTP's volatility. The coefficient value of COP is significantly negative. This means that the rise in COP by one percent will cause reduction in BTP by 0.63%. Or in another way, the rise in BTP may cause reduction in the price of Bitcoin. In reality, it indicates that the COP and BTP inverse relation, meaning that price decreases in COP or improper decrease in price may help to increase the price of BTP. Same interpretation may be considered for GOP also. In addition to those results, after taking log value to all the variable, existence of auto-correlations has also been nullified in Eq.-2.

CONCLUSION

Therefore, from the above study results of correlations it can be said that there is significant positive relationship of gold price, crude oil price with Bitcoin price. The descriptive table is showing that there is very high volatility of Bitcoin price and volume in comparison with other variable in addition to the better return. To confirm this assumption, ARCH model is formed in Eq.-2 and the equation is showing that the reduction in the price of gold and crude oil may cause a significant increase in Bitcoin price. However, further study needed on the actual quantification in terms of counting of Bitcoin. These results are also showing that in near future money and digital money may get less priority if the crypto currency will be more secured. Beside these results, we should not forget that Bitcoin has invented in the year 2008, which is certainly the year of sub-prime crisis. So, there is high possibility of inclusion of toxic money in the Bitcoin or crypto currency market. It may be said that the short period improvement may cause another bubble burst very soon. Increase in the number of time series data will make the study more robust.

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