

## Cryptocurrency Market Anomaly : The Day-of-the-Week-Effect<sup>1</sup>

RUCHITA VERMA \*  
DHANRAJ SHARMA \*\*  
SHINEY SAM \*\*\*

---

### Abstract

Cryptocurrency has emerged as a fad amongst investors, academicians and policy-makers as a financial asset, making it important to empirically test the price behaviour of this emerging market. This paper is designed to investigate the presence of a well-known day-of-the-week effect in the young and emerging cryptocurrency market returns from August 2015 to March 2019. Using varied statistical techniques, this anomaly is examined for six cryptocurrencies (Bitcoin, Ethereum, Ripple, Litecoin, Stellar and Tether). The study applies both parametric and non-parametric statistical tests, i.e., Bar Graph, Heat map, Student's t-test, Analysis of Variance (ANOVA), regression analysis with dummy variables and the Kruskal Wallis Test. The study's findings show that no sample cryptocurrency returns exhibit the day-of-the-week effect phenomenon. The statistically insignificant result of the day-of-the-week effect in the cryptocurrency returns showcases the evidence of market efficiency in the cryptocurrency market.

---

JEL Code : C12; G14

Keywords : Cryptocurrency; Day-of-the-week Effect; Anomaly; Market efficiency; India

### I. Introduction

THE EFFICIENT MARKET hypothesis demands that prices of a security, commodity or currency in the market should fully reflect any given and readily available set of information about their intrinsic value (Kaushik, 2017), leading to impossible abnormal returns. However, many studies have focused on exploring and analysing varied trading strategies to plough above normal returns questioning the market efficiency. In the set of such research, several scientific findings demonstrate Calendar influences like

---

<sup>1</sup> Presented at IIF International Research Conference & Award Summit, August 2020

\* Assistant Professor, Central University of Punjab, Department of Financial Administration, Village Ghudda, District Bhatinda, Punjab 151001, INDIA.

\*\* Assistant Professor, Central University of Punjab, Department of Financial Administration, Village Ghudda, District Bhatinda, Punjab 151001, INDIA.

\*\*\* Assistant Professor, CHRIST (Deemed to be University), School of Business and Management, Hosur Road, Bangalore, Karnataka 560029, INDIA.

*Submitted August 2020; Accepted April 2022*

the day of the week effect and find the statistically significant evidence of the anomaly, both parametric (Average analysis, Heatmaps, Student's t-test, ANOVA, Regression with dummy variables) and non-parametric methods (Kruskal – Wallis and Mann – Whitney) are applied.

The primary technique applied is a pictorial presentation of Bar graph, and Heatmaps (through the average of the returns) indicates the absence of any day effect anomaly. Further, parametric tests of the Student's t-test and ANOVA showcased no variation or higher returns on any day of the week. Similar results were observed for the non-parametric test of Kruskal-Wallis and Mann-Whitney. Finally, the robustness of the examination of the result is affirmed through the dummy regression analysis followed by a majority of the research to evaluate the time-specific anomalies.

The empirical results observe no persistent and significant variation (higher returns) or anomaly in the cryptocurrency returns for day-of-the-week effect for any day of the week. The conclusion of the present study is consistent with the findings reported in Baur, Cahill, Godfrey and Liu (2019) and Yaya and Ogbonna (2019). To summarise, the study provides no evidence against the efficiency of the cryptocurrency market. This is important from an investor's point of view as it is clear that this young market quickly absorbs any information available, giving no large arbitrage profits to any investor. A further study can be carried out using other cryptocurrencies such as Monroe, Dash, Binance and many more, studying other calendar anomalies such as the March effect, December effect, time of the day effect, holiday effect, which have been carried out previously in the traditional markets.

### References

- Abraham, J., D. Higdon, J. Nelson and J. Ibarra, (2018), "Cryptocurrency price prediction using tweet volumes and sentiment analysis", *SMU Data Science Review*, Vol. 1, No. 3, pp. 1.
- Aharon, D. Y., and M. Qadan, (2018), "Bitcoin and the day-of-the-week effect", *Finance Research Letters*, Vol. 31
- Agarwal, J.D., M. Agarwal, Aman Agarwal and Yamini Agarwal, (2018), "The Theory of Money, Wealth and Efficient Currency Markets: Modeling M5 as Money Supply with Crypto-Currency", *Finance India*, Vol. 32, No. 2, pp. 1-52
- Aysan, A.F., E. Demir, G. Gozgor and C.K.M. Lau, (2019), "Effects of the geopolitical risks on Bitcoin returns and volatility", *Research in International Business and Finance*, Vol. 47, pp. 511-518.
- Jakub, B., (2015), "Does Bitcoin follow the hypothesis of efficient market?" *International Journal of Economic Sciences*, Vol. 4, No. 2, pp. 10-23.
- Baur, D. G., D. Cahill, K. Godfrey and Z.F. Liu, (2019), "Bitcoin time-of-day, day-of-week and month-of-year effects in returns and trading volume", *Finance Research Letters*, Vol. 31, pp. 78-92.

Caporale, G. M., and A. Plastun, (2018), "The day of the week effect in the cryptocurrency market", *Finance Research Letters*, Vol. 31.

Carrick, J. (2016), "Bitcoin as a complement to emerging market currencies", *Emerging Markets Finance and Trade*, Vol. 52, No. 10, pp. 2321-2334.

Cheung, A., E. Roca and J.J. Su, (2015), "Crypto-currency bubbles: an application of the Phillips-Shi-Yu (2013) methodology on Mt. Gox bitcoin prices", *Applied Economics*, Vol. 47, No. 23, pp. 2348-2358.

Corbet, S., B. Lucey, A. Urquhart and L. Yarovaya, (2019), "Cryptocurrencies as a financial asset: A systematic analysis", *International Review of Financial Analysis*, Vol. 62, pp. 182-199.

Cross, F., (1973), "The behavior of stock prices on Fridays and Mondays", *Financial Analysts Journal*, Vol. 29, No. 6, pp. 67-69.

Das, D., and M. Kannadhasan, (2018), "Do global factors impact bitcoin prices? Evidence from Wavelet approach", *Journal of Economic Research*, Vol. 23, pp. 227-264.

Décourt, R. F., U.W. Chohan and M.L. Perugini, (2017), "Bitcoin returns and the monday effect", *Horizontes Empresariales*, Vol. 16, No. 2.

Durai, S. R. S., and S. Paul, (2018), "Calendar anomaly and the degree of market inefficiency of Bitcoin", Madras School of Economics working paper no. 168.

Dwyer, G. P., (2015), "The economics of Bitcoin and similar private digital currencies", *Journal of Financial Stability*, Vol. 17, pp. 81-91.

Fama, E.F., (1960), "Efficient market hypothesis", Doctoral dissertation (unpublished), University of Chicago Graduate School of Business.

Fields, M. J., (1931), "Stock prices: a problem in verification", *The Journal of Business of the University of Chicago*, Vol. 4, No. 4, pp. 415-418.

Fortune, P. (1998), "Weekends can be rough: revisiting the weekend effect in stock prices", Federal Reserve Bank of Boston. Working Paper No. 98-106.

French, K. R., (1980), "Stock returns and the weekend effect", *Journal of financial economics*, Vol. 8, No. 1, pp. 55-69.

Kaiser, L., (2018), "Seasonality in cryptocurrencies", *Finance Research Letters*, Vol. 31

Kapar, B., and J. Olmo, (2019), "An analysis of price discovery between Bitcoin futures and spot markets", *Economics Letters*, Vol. 174, pp. 62-64.

Kaushik, N., (2017), "Anomalies in indian stock market: Day-of-the-week effect", *IIMS Journal of Management Science*, Vol. 8, No. 3, pp. 312-320.

Kim, Y. B., J.G. Kim, W. Kim, J.H. Im, T.H. Kim, S.J. Kang and C.H. Kim, (2016), "Predicting fluctuations in cryptocurrency transactions based on user comments and replies", *PloS one*, Vol. 11, No. 8, pp. 161-197.

Kothishwar, A. ,(2021), "Influence of cryptocurrency on select global currencies – A study", *Finance India*, Vol. 35, No. 3, pp. 891-922

Kristoufek L, (2015), "What Are the Main Drivers of the Bitcoin Price? Evidence from Wavelet Coherence Analysis", *PLoS ONE*, Vol. 10, No. 4, pp. 123-923.

Kurihara, Y., and A. Fukushima, (2017), "The market efficiency of Bitcoin: a weekly anomaly perspective", *Journal of Applied Finance and Banking*, Vol. 7, No. 3, pp. 57.

Lamon, C., E. Nielsen and E. Redondo, (2017), "Cryptocurrency price prediction using news and social media sentiment", *SMU Data Sci. Rev*, Vol. 1, No. 3, pp. 1-22.

Ma, D., and H. Tanizaki, (2019), "The day-of-the-week effect on Bitcoin return and volatility", *Research in International Business and Finance*, Vol. 49, pp. 127-136.

Malik, N. S., K. Bhardawaj and R. Singla, (2019), "Price Discovery and Arbitrage Efficiency Test: A Study of Indian Options Market", *Finance India*, Vol. XXXII, No. 3, pp. 623-638.

Schwert, G., (2003), "Anomalies and market efficiency", chapter 17 of the Handbook of Economics and Finance in G. Constantinides, M. Harris, and R. Stulz, edited book. pp 937-932

Shen, D., A. Urquhart and P. Wang, (2019), "Does twitter predict Bitcoin?", *Economics Letters*, Vol. 174, pp. 118-122.

Urquhart, A. (2016), "The inefficiency of Bitcoin", *Economics Letters*, Vol. 148, pp. 80-82

Sovbetov, Y. (2018), "Factors influencing cryptocurrency prices: Evidence from bitcoin, ethereum, dash, bitcoin, and monero", *Journal of Economics and Financial Analysis*, Vol. 2, No. 2, pp. 1-27.

Varma, J. R. (2019), "Blockchain in finance", *Vikalpa*, Vol. 44, No. 1, pp. 1-11.

Wei, W.C., (2018), "Liquidity and market efficiency in cryptocurrencies", *Economics Letters*, Vol. 168, pp. 21-24.

Yaya, O. S., and E.A. Ogbonna, (2019), "Do we Experience Day-of-the-week Effects in Returns and Volatility of Cryptocurrency?", SSRN Network.