Volume 31 (Special Issue) October 2024 ISSN 0216-423X (Print)
ISSN 2622-2667 (Online)

JABM
JOURNAL *of*
ACCOUNTING, BUSINESS and MANAGEMENT

Journal of Accounting, Business and Management (JABM) vol. 31 Special Issue 2024 180-196

Literature Review: Evidence of Day-of-the-Week Effect in Cryptocurrency Market

Tan Sze Kie*
Ricky Chia Chee Jiun†

Abstract

This study provides a comprehensive analysis of the anomaly of day-of-the-week effect found in cryptocurrency market. Its primary objective is to synthesize existing literature and offer an overview of the current understanding of this phenomenon, while identifying trends and research gaps. A systematic literature review was conducted across three major databases—emerald insight, science direct, and JSTOR—using the keywords "cryptocurrencies" or "cryptocurrency" and "day of the week effect." After applying inclusion and exclusion criteria, 10 relevant articles were identified, and an additional 5 studies were included through manual data extraction from included studies, resulting in a total of 15 articles analyzed. The findings reveal increasing evidence of day-of-the-week effect in cryptocurrency markets, with specific days exhibiting significantly higher or lower returns. However, the exact patterns and underlying drivers of this effect remain underexplored. This review emphasizes the need for additional research to gain a deeper understanding of the time-based anomalies in cryptocurrency price fluctuations and their effects on investors and policymakers.

Keywords: monday effect, day-of-the-week effect, bitcoin, cryptocurrency market.

I. INTRODUCTION AND BACKGROUND

Cryptocurrencies have emerged as a novel asset class, attracting significant investor interest due to their perceived market inefficiencies. The day-of-the-week effect, a widely recognized anomaly in traditional stock markets, offers a fascinating avenue for exploration within the realm of cryptocurrencies. Although this phenomenon has been thoroughly examined in equity markets, its existence and significance in the cryptocurrency sector have yet to be extensively investigated. Practical applications of this research could include the development of trading strategies that exploit potential day-of-the-week trends in cryptocurrency returns. However, the rapidly evolving nature of the cryptocurrency market poses challenges in identifying persistent anomalies that can be reliably exploited for abnormal returns. By investigating the day-of-the-week effect in cryptocurrencies, this study aims to bridge the practical gap and offer valuable insights to investors and policymakers navigating the evolving cryptocurrency market. Understanding the presence and characteristics of this effect can inform investment strategies and guide regulatory decisions in this emerging financial domain.

The efficient market hypothesis (EMH), introduced by Fama (1970), asserts that financial markets effectively assimilate all available information, resulting in unpredictable movements in asset prices. According to this hypothesis, consistently achieving returns that exceed average market returns on a risk-adjusted basis is not feasible, as current prices already incorporate all pertinent information (Nik Muhammad & Rahman, 2010).

* Corresponding author. Universiti Malaysia Sabah, Labuan Faculty of International Finance, Postgraduate Student. Phone: 0128441197. E-mail: mg2011010t@iluv.ums.edu.my.
† Universiti Malaysia Sabah, Labuan Faculty of International Finance, Senior Lecturer. E-mail: ricky_82@ums.edu.my.

However, the existence of the day-of-the-week effect in stock markets presents a challenge to the efficient market theory, suggesting that market inefficiencies or anomalies may persist. When the day-of-the-week effect is evident in a market, it indicates that asset prices do not fully reflect all available information, allowing investors to potentially capitalize on this pattern to secure above-average returns by trading on specific days. This observation contradicts the weak form of the EMH, which posits that prices incorporate all information derived from historical price movements. If the day-of-the-week effect is also found in cryptocurrency markets, it would further undermine the concept of efficient markets, indicating that prices do not consistently reflect all available information. Such findings could have profound implications for investment strategies and regulatory practices within the cryptocurrency sector.

Numerous studies have explored the day-of-the-week effect across various financial markets, including both stock and cryptocurrency markets. The results have been inconsistent, with some research confirming the existence of this anomaly while others find no supporting evidence. For instance, Aharon and Qadan (2019) reported that bitcoin displays the daily anomaly, noting higher returns and volatility on Mondays compared to other days. Conversely, Baur et al. (2019) found no persistent or recurring calendar-based anomalies in cryptocurrency returns. Furthermore, the day-of-the-week effect may not remain stable over time, as markets can transition from less efficient to more efficient states (Obalade & Muzindutsi, 2019).

Extending the investigation of the day-of-the-week effect to the cryptocurrency market offers a significant opportunity to assess the validity of the efficient market hypothesis (EMH) within this innovative asset class. Cryptocurrencies, characterized by their unique features such as decentralization and scarcity (Nakamoto, 2008), may exhibit market dynamics that differ markedly from those of traditional financial assets. By examining the day-of-the-week effect as it pertains to cryptocurrencies, researchers can contribute to the ongoing theoretical discourse regarding market efficiency and the potential for predictability in asset price movements (Caporale et al., 2019). Addressing this theoretical gap will enhance our understanding of the factors that influence cryptocurrency prices and the relevance of established financial theories in this rapidly evolving domain.

This study aims to bridge both practical and theoretical gaps by exploring the day-of-the-week effect specifically within the cryptocurrency market. By investigating potential anomalies in cryptocurrency returns across various days of the week, this research can yield valuable insights for investors and policymakers alike. Furthermore, it adds to the wider theoretical discourse on market efficiency as it relates to digital assets. Understanding whether specific days yield different returns can inform trading strategies and regulatory approaches, ultimately enhancing decision-making in this emerging financial landscape. The implications of such findings are crucial, as they could influence how market participants navigate the complexities of cryptocurrency investments and the strategies they employ to optimize returns.

II. METHODOLOGY OF PAPERS SELECTION

The methodology for this systematic literature review involves both approaches by combining database searches and manual data extraction in order to extract additional relevant literature. The key steps are as follows:

2.1. Database Searches

A thorough search was conducted across several major academic databases, including Emerald Insight, Science Direct, and JSTOR, utilizing the keywords

"cryptocurrencies" or "cryptocurrency" in conjunction with "day of the week effect." This initial search yielded a total of 218 results across the three databases, indicating a substantial body of literature related to the topic.

To refine these results and ensure relevance, specific filters were applied, which led to the selection of 10 articles that were deemed suitable for inclusion in the review. The selection process revealed that 3 of these articles were sourced from Emerald Insight, while 7 were obtained from Science Direct. Notably, no articles from JSTOR met the inclusion criteria for this particular study. This systematic approach to literature selection not only ensured the relevance of the included studies but also provided a solid foundation for analyzing the day-of-the-week effect in the context of cryptocurrencies, setting the stage for a comprehensive review of existing research on this intriguing financial phenomenon.

2.2. Manual Data Extraction from Included Studies

The initial database searches and application of inclusion criteria yielded a total of 10 articles deemed suitable for a semi-systematic literature review centered on the day-of-the-week effect in cryptocurrency markets. To expand the knowledge base, the reference lists of these included articles were meticulously scrutinized to identify any additional relevant studies. This comprehensive examination led to the identification of 5 more studies considered pertinent to the review, culminating in a final corpus of 15 studies that were ultimately incorporated into the analysis.

The process of integrating these studies involved a careful reading of each one, during which key information was systematically recorded using a standardized data extraction form. This form included various fields to capture essential study characteristics, such as authors, publication year, and journal, as well as details on methodology, including data sources and statistical techniques employed. Additionally, findings related to the day-of-the-week effect in prices of the cryptocurrency were documented to facilitate a comprehensive analysis.

After extracting the data from the 15 chosen studies, a synthesis process was undertaken to deliver a cohesive overview of the existing knowledge regarding the day-of-the-week effect in cryptocurrency markets. This synthesis process involved identifying and summarizing key themes, methodologies, and conclusions in a narrative format. The aim was to highlight the existing state of research, pinpoint any gaps, and inform future investigations in this area. By employing meticulous manual data extraction techniques, the review effectively gathered and synthesized the available evidence on the day-of-the-week effect in cryptocurrency markets. Furthermore, the systematic documentation of the search process and data extraction methods ensures transparency and allows for the replication of the review's findings, enhancing the credibility and reliability of the research.

III. EVIDENCE IN STOCK MARKETS

The day-of-the-week effect is a well-documented calendar anomaly in financial markets that has captured the interest of researchers and scholars for many years. This phenomenon, characterized by variations in asset returns on different days of the week, has generated a significant amount of research focused on understanding its implications and the underlying factors that contribute to these patterns. Importantly, the day-of-the-week effect is not confined to the U.S. equity market; it has also been observed in various international markets, underscoring its broader significance within global financial contexts. Empirical studies consistently indicate that average returns on Mondays are generally lower than those on other days, while Fridays often show significantly higher

returns. These findings raise important questions about the factors driving such patterns, as they challenge the concept of market efficiency.

3.1. Historical Context and Key Studies

The foundational studies that have significantly deepened our understanding of the day-of-the-week effect include influential works by Fields (1931), Cross (1973), French (1980), and Gibbons & Hess (1981). These pioneering researchers have provided valuable insights into market behaviors and anomalies that continue to resonate within the finance field. Their findings consistently demonstrate that certain days of the week, particularly Mondays, display distinct patterns in stock returns, with Mondays often yielding lower average returns compared to other days. This phenomenon, referred to as the day-of-the-week effect, has been documented not only in the U.S. equity market but also across various international markets, underscoring its global significance as a market anomaly.

Initial investigations into this effect have particularly focused on the so-called "Monday effect," characterized by predominantly negative returns on Mondays. Frank Cross's 1973 study was one of the first to document this effect, and since then, it has sparked extensive research and debate within academic circles. The ongoing exploration of these findings has led to a richer understanding of market dynamics and investor behavior, further solidifying the day-of-the-week effect as a critical area of study in finance.

Fields' pioneering study in 1931, which examined the Dow Jones daily average of industrials from 1915 to 1930, established a foundation for subsequent research into this fascinating phenomenon. His early work offered initial insights into the behavior of stock prices on different days of the week, paving the way for a multitude of further investigations. This call for deeper exploration has resonated through the years, with scholars such as French (1980) and Keim and Stambaugh (1984) building on Fields' groundwork to reveal patterns like the tendency for lower returns on Mondays and higher returns on Fridays. Additionally, Rogalski (1984) introduced the concept of the non-trading weekend effect, while Jaffe and Westerfield (1985) specifically focused on identifying the Monday effect within the U.S. market. The sustained interest in the day-of-the-week effect is reflected in the works of Liano and Gup (1989), Abraham and Ikenberry (1994), and Wang et al. (1997), who have investigated nuanced effects across various economic cycles and weeks of the month. Collectively, these studies contribute to a rich tapestry of research that continues to evolve as scholars strive to unravel the complexities of market behavior and the implications of the day-of-the-week effect in both traditional and emerging financial contexts.

The global significance of the day-of-the-week effect is highlighted by substantial research conducted in various markets, including the Indian market by Raj and Kumari (2006) and broader Asian stock markets by Lean et al. (2007). These studies have broadened the understanding of this anomaly beyond Western markets, demonstrating its presence and implications in diverse financial environments. Additional contributions to this body of knowledge come from Cho et al. (2007), who observed notable effects across different stock indexes, reinforcing the notion that the day-of-the-week effect is not limited to a specific region but is a widespread phenomenon in global finance. The persistence of this effect is further supported by studies examining the Johannesburg stock exchange (JSE) indices from 1995 to 2016, emphasizing its lasting relevance in understanding market dynamics and trading behaviors across various contexts.

A multitude of researchers, including Keim and Stambaugh (1984), Rogalski (1984), Jaffe and Westerfield (1985), Jacobs and Levy (1988), Aggarwal and Rivoli (1989), Liano and Gup (1989), Lakonishok and Maberly (1990), Abraham and Ikenberry (1994), Sias and Starks (1995), Wang et al. (1997), Chen and Singal (2003), Lean et al. (2007), Berument et al. (2007), Chia et al. (2008), Jones et al. (2009), Lim and Chia (2010), and Brusa et al. (2011), have all played a significant role in the ongoing discussion surrounding this intriguing market phenomenon. Their collective contributions have enriched the academic landscape, offering a thorough examination of the day-of-the-week effect across various markets and timeframes. This extensive body of research not only deepens our understanding of market anomalies but also encourages further exploration into the behavioral and structural factors that may influence these patterns. As scholars continue to investigate the complexities of the day-of-the-week effect, the insights derived from these studies will remain crucial in shaping future research and informing practical applications in trading strategies and market analysis.

3.2. Monday Effect and Its Implications

Rogalski's influential 1984 study shed light on the existence of a weekend effect within the New York stock exchange (NYSE) and S&P 500 markets. His research revealed a pattern where negative average returns were observed from Friday's close to Monday's open, leading to compounded negative returns from one Monday's close to the next. This finding indicated that Mondays tend to underperform due to the negative returns accumulating over the weekend. Keim & Stambaugh's concurrent research further reinforced the notion of a consistent negative Monday effect, demonstrating its observability since at least 1928, highlighting the deep historical roots of this market anomaly.

In 1985, Jaffe and Westerfield expanded the understanding of the weekend effect by establishing its presence across multiple countries, including Canada, the United Kingdom, and the United States. Their findings emphasized the widespread relevance of the Monday effect, suggesting it is not confined to any single market. Furthermore, Jacobs and Levy's (1988) study introduced the "Monday blues" concept, illustrating the considerable negative returns on Mondays compared to other trading days, solidifying the idea that Mondays pose particular challenges for investors. This accumulation of research underscores the significance of the day-of-the-week effect as a critical area of inquiry in financial markets, prompting ongoing discussions about its implications and underlying factors. Collectively, these studies provide a historical context for understanding market anomalies and invite further exploration into the behavioral and structural dynamics influencing trading outcomes across different days of the week.

3.3. Behavioral Factors and Investor Activity

Research has thoroughly examined the behavioral factors that influence the day-of-the-week effect, offering valuable insights into the interplay between investor psychology and market dynamics. For instance, in 1989, Liano and Gup conducted a study that revealed significantly negative returns on Mondays compared to other weekdays in the stock market, analyzing data from 1963 to 1986. Their findings added further evidence to the ongoing discussion surrounding the day-of-the-week effect, indicating that this anomaly is deeply embedded in market behavior. Additionally, Connolly's research in the same year challenged existing assumptions about the timing of stock return declines. He demonstrated that these declines occur between Friday's close and Monday's open, rather than between Friday's close and Monday's close, as was commonly believed. This crucial insight suggests that Mondays typically have lower

average returns than Fridays, and Connolly emphasized that this phenomenon cannot be solely attributed to non-trading days.

Further contributing to this discourse, Lakonishok and Maberly's 1990 study examined the trading behaviors of individual and institutional investors on the NYSE over a 25-year period. Their findings revealed that individual investors are particularly active sellers on Mondays, especially following negative market news, which correlates strongly with the observed returns from Friday to Monday. This indicates that investor sentiment and reactions to market information significantly shape the day-of-the-week effect. In 1995, Sias and Starks expanded on this narrative by suggesting that the Monday effect is influenced by the trading behaviors of institutional investors, complicating the understanding of this anomaly. Their research highlighted the relationship between institutional trading patterns and market returns, suggesting that the dynamics of investor behavior are essential for comprehending the complexities of the day-of-the-week effect. Collectively, these studies emphasize the importance of behavioral factors in financial markets, revealing how psychological elements and trading strategies can profoundly impact stock returns on different days of the week.

3.4. Global Perspectives on the Anomaly

The Monday effect, as articulated by Wang et al. (1997), is primarily attributed to the influence of weekend news and investor behavior rather than simply delayed reactions to news from Friday. This finding emphasizes the significant role that market sentiment plays in shaping return patterns, suggesting that how investors react to information can substantially impact trading outcomes. Their research also uncovered that the mean return on Mondays during the last two weeks of the month tends to be lower compared to the first three weeks, suggesting that the timing of trading activities may further influence the manifestation of the day-of-the-week effect. Additionally, Kamara (1997) investigated the seasonality of the S&P 500 from 1962 to 1993 and discovered a reverse Monday effect in futures trading compared to spot S&P returns, underscoring a divergence in trading behaviors between these two markets.

Further investigations by Liano et al. (1999) demonstrated that the day-of-the-week effect persists across different political administrations, with more pronounced negative returns on Mondays noted during Republican administrations. In a related vein, Chen and Singal (2003) explored how the availability of put options could mitigate the weekend effect, suggesting that the presence of speculative short sellers plays a crucial role in influencing market dynamics. Lean et al. (2007) extended the discussion to Asian markets, where they observed abnormal returns characterized by higher returns on Fridays and lower returns on Mondays, reinforcing the global nature of this anomaly.

Interestingly, Raj and Kumari (2006) findings on the Indian stock market yielded unique results; they found no negative Monday or January effects. Instead, their research highlighted a positive trend on Mondays and a negative trend on Tuesdays, suggesting that cultural and market-specific factors may significantly influence the manifestation of the day-of-the-week effect in different regions. This finding is consistent with the extensive literature on calendar anomalies, where numerous studies have persistently reported substantial mean negative returns on Mondays and significant mean positive returns on Thursdays and Fridays, particularly in the context of the day-of-the-week effect, as highlighted by Tadepalli and Jain (2018). Berument et al. (2007) further contributed to this discussion by documenting higher returns on Thursdays compared to Wednesdays, while Mondays displayed lower returns and increased volatility on both Mondays and Tuesdays.

In 2009, Jones et al. revealed that larger offers on Mondays contribute to the observed anomaly, indicating that seasoned equity offerings (SEOs) issued on Mondays tend to have larger discounts, which could significantly influence investor behavior and overall market dynamics. Lim and Chia (2010) identified similar patterns in the Malaysian and Thai markets, noting lower the returns specifically on Mondays in Malaysia and greater returns on Fridays in Thailand, thus emphasizing the need for region-specific analyses of this market phenomenon.

Moreover, Brusa et al. (2011) noted that smaller companies often experience negative Monday returns, while larger companies typically observe positive returns, showcasing a reversed weekend effect that varies based on market capitalization. The pronounced Monday effect observed in Egypt's stock market stands in contrast to weaker Monday effects in Mauritius, Nigeria, and Tunisia, highlighting distinct regional variations. Interestingly, Kenya and Nigeria exhibit lower levels of Monday volatility, suggesting that local market conditions may significantly influence the manifestation of this anomaly. Research upon South African stock market indicated that other examined markets do not demonstrate significant Monday volatility, revealing asymmetrical behavior across these markets as evidenced by leverage effect terms, as noted by Chia and Lim (2011).

Conversely, research has also identified day-of-the-week effects extending beyond Mondays into other weekdays. For instance, a study on the Japanese stock market conducted by Jaffe and Westerfield (1985) from 1970 to 1983 found that the lowest average returns occurred on Tuesdays, reflecting a seasonal pattern similar to that observed in the United States but shifted by one day. Kato (1990) further explored the Tokyo stock exchange from 1978 to 1987, revealing lower returns on Tuesdays and higher returns on Wednesdays, indicating that day-of-the-week effect can manifest differently across various markets. Additionally, a study on Turkish foreign exchange markets by Aydoğan and Booth (2003) found significantly larger exchange rate fluctuations on Tuesdays and Wednesdays compared to other weekdays, further illustrating the complexity and variability of the day-of-the-week effect across different financial contexts.

Research on the Johannesburg stock exchange (JSE) indices from July 1995 to March 2016 revealed consistent patterns in market behavior, particularly highlighting positive mean returns on Mondays and Tuesdays, while Fridays showed negative mean returns. These results reinforce the idea that the day-of-the-week effect is a persistent phenomenon across various financial markets. Notably, the Hong Kong stock market has been recognized for its unique "Friday effect," indicating potential inefficiencies in how price information is processed and reflected in market behavior, as noted by Chia et al. (2015).

A comprehensive analysis involving 28 stock markets, both developed and emerging, conducted by Zhang et al. (2017), found the presence of day-of-the-week effects across all countries studied. Their findings indicated that while significant effects were observed on Mondays for the Dow Jones industrial index, the S&P 500 Index exhibited notable patterns on Tuesdays. This suggests that different stock indices may display varying manifestations of the day-of-the-week effect, complicating the understanding of market dynamics.

Additionally, various anomalies have been documented on different days in other countries, such as Wednesday anomalies in multiple markets, Thursday anomalies in specific regions, and Friday anomalies in several others. These observations highlight the complexity and multifaceted nature of the day-of-the-week effect across diverse market

contexts. The persistence of these patterns emphasizes the importance of considering both local market conditions and broader economic factors when analyzing trading behaviors and investment strategies. As researchers continue to explore the intricacies of these anomalies, their findings contribute to a deeper understanding of how market sentiment and investor psychology can influence financial outcomes on different days of the week.

3.5. Recent Findings and Evolving Patterns

Recent research has continued to examine the day-of-the-week effect, uncovering changing patterns in stock returns that imply this anomaly may be diminishing or even vanishing over time. Significant studies by Chang et al. (1993), Keef and Roush (2002), and Al-Khazali (2008) have underscored a declining presence of this effect, particularly emphasizing the Monday effect. Specifically, their results indicate that the impact of the Monday effect has substantially weakened in major indices such as the Dow Jones and S&P 500 since 1987. Nevertheless, it persists more strongly in broader indices like NASDAQ, Russell 2000, and CRSP, suggesting that market capitalization and index composition are critical factors in the manifestation of this anomaly.

Attempts to validate the day-of-the-week effect in emerging stock markets, including those in Saudi Arabia, Kuwait, and Bahrain, have encountered challenges, particularly when adjusting for thin trading conditions and the Saturday effect, as noted by Al-Khazali et al. (2010). Philpot and Peterson (2011) observed notable changes in the significance of this anomaly over time, indicating a potential fading trend. Additionally, Alt et al. (2011) and Nippani and Greenhut (2011) found variations in day-of-the-week effect across different markets, suggesting that this phenomenon may not be universally applicable and could be influenced by local market conditions and investor behavior.

Further analysis of the Dow Jones industrial average (DJIA) index from 1900 to 2013 by Urquhart and McGroarty (2014) demonstrated a lack of persistence in the Monday effect over the years, reinforcing the idea that market dynamics are subject to change. Studies focusing on the MICEX market index emphasized the critical role of transaction costs, which can obscure or eliminate observed anomalies, as highlighted by Caporale and Zakirova (2017). Research on the Chinese stock market from 1996 to 2015 identified various calendar effects, showing inconsistent performance across different time periods and supporting the Adaptive Market Hypothesis (AMH), as indicated by Xiong et al. (2019).

In the context of the Gulf Cooperation Council (GCC) countries, including Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, and the UAE, a fifth-day effect was observed, along with various return patterns on different weekdays, as noted by Yardımcı and Erdem (2020). Recent findings in 2021 by Gkillas et al. revealed that the highest speed of adjustment in stock returns was often observed on Wednesdays, followed by Thursdays, suggesting a dynamic evolution of the day-of-the-week effect over time. A study examining the Bangladesh stock market from 2011 to 2020 identified the presence of seven calendar effects, including the day-of-the-week effect, highlighting the ongoing relevance of these anomalies in stock market dynamics, as suggested by Hasan et al. (2022).

Collectively, these studies illustrate the complexity and variability of the day-of-the-week effect across different markets and time periods, emphasizing the need for continued research to understand the underlying factors and implications of this phenomenon in the ever-evolving landscape of financial markets.

IV. RESULTS AND DISCUSSIONS

4.1. Evidence of Day-of-the-Week Effect in Cryptocurrency Market

Research on the cryptocurrency market has provided fascinating insights into the existence and implications of day-of-the-week effects, particularly regarding bitcoin and other digital currencies. Several significant studies, including those by Kaiser (2018), Aharon and Qadan (2019), Caporale and Plastun (2019), and Qadan et al. (2021), emphasize a notable positive effect on Mondays for bitcoin, indicating that this day is associated with significantly higher returns compared to other days of the week. This Monday effect in bitcoin returns has been observed across various time periods and datasets, demonstrating a consistent market behavior pattern.

While bitcoin shows a clear Monday effect, other cryptocurrencies such as litecoin, ripple, and dash have not exhibited distinct day-of-the-week effects, as noted by Caporale and Plastun (2019). This suggests that the day-of-the-week anomaly may be specific to bitcoin rather than applicable to the broader cryptocurrency market. However, a more comprehensive study encompassing bitcoin, dash, litecoin, ripple, and ethereum indicates a Monday effect across all five cryptocurrencies (Naz et al., 2023), suggesting the potential for this anomaly to exist in other digital currencies as well.

Interestingly, Decourt et al. (2017) found that bitcoin tends to yield higher returns on Tuesdays and Wednesdays compared to other days, hinting at a possible calendar anomaly influenced by factors such as investor behavior and prevailing market sentiment. This finding implies that the day-of-the-week effect in bitcoin may extend beyond Mondays and could manifest on other days of the week. Conversely, Dorfleitner and Lung (2018) discovered that returns for all eight cryptocurrencies studied were significantly lower on Sundays, likely due to reduced trading volumes typically seen on that day. Additionally, positive effects on Mondays and Thursdays are apparent when analyzing bitcoin prices across various currencies (Ma & Tanizaki, 2019), indicating that the day-of-the-week effect can vary depending on the specific market or currency pair examined.

Moreover, Mbanga (2019) identified a phenomenon known as price clustering in bitcoin, where prices tend to concentrate around whole numbers, with this effect being more pronounced on Fridays than on Mondays. This finding suggests specific trading behavior patterns that emerge on different days of the week, highlighting the potential for day-of-the-week effects to influence not only returns but also price distribution in the bitcoin market.

However, it is important to note that Kinateder and Papavassiliou (2019) found no evidence of the day-of-the-week anomaly in bitcoin, indicating that the market may be evolving toward greater efficiency. Based on empirical results, some studies suggest that bitcoin may become increasingly efficient over time (Kurihara & Fukushima, 2017). Additionally, research by Baur et al. (2019), Ma and Tanizaki (2019), Khuntia and Pattanayak (2022), and Mueller (2024) indicates that while there are time-specific anomalies in bitcoin returns, these patterns are not persistent over time, underscoring the complex and evolving nature of cryptocurrency markets. This highlights the need for ongoing research to better understand the factors influencing these anomalies and their implications for investors and market participants.

Table 1 summarizes the key findings from several studies that have examined the day-of-the-week effect in cryptocurrency markets, particularly bitcoin. In summary, while some studies find evidence of a day-of-the-week effect, particularly a Monday effect, in bitcoin and other cryptocurrencies, the findings are mixed and the anomaly does not

appear to be persistent across all studies and time periods. The day-of-the-week effect in cryptocurrencies remains an active area of research, with implications for trading strategies and market efficiency.

Table 1
List of Studies of the Day of the Week Effect in Cryptocurrencies

No.	Authors	Sample	Methodology	Results
1	Decourt et al. (2017)	Bitcoin (2013-2018)	Student's t-test	Presence of day-of-the-week effect, with Tuesdays and Wed-nesdays having higher average daily returns than other weekdays
2	Kurihara and Fukushima (2017)	Bitcoin (2010-2016)	Student's t-tests, ANOVA, the Kruskal-Wallis test, and regres-sion analysis with dummy variables	The calendar anomalies were present initially, but faded over the later part of the study period
3	Dorfleitner and Lung (2018)	Bitcoin, litecoin, dash, Ether, ripple, monero, stellar, lumens, and nem (2015-2018)	Mean-variance spanning tests, ARMA-EGARCH(-M)	The study found that the returns of all 8 cryptocurrencies were sig-nificantly lower on Sundays com-pared to other days of the week. A similar, but less pronounced, pattern was also observed in the conditional variance of the cryptocurrency returns
4	Aharon and Qadan (2019)	Bitcoin (2010-2017)	OLS, GARCH	Mondays tend to have higher average returns and volatility levels for bitcoin compared to other days of the week
5	Caporale and Plastun (2019)	Bitcoin, litecoin, ripple, dash (2013-2017)	Student's t-test, ANOVA, Krus-kal-Wallis and Mann-Whitney tests and regres-sion analysis with dummy variables	Litecoin, ripple, and dash do not display day-of-the-week effect, but bitcoin does exhibit this anomaly
6	Mbanga (2019)	Bitcoin (2011-2018)		Prices of bitcoin show the most clustering on Fridays and the least clustering on Mondays. The clustering of bitcoin prices around the top three most frequent two-digit decimals is primarily obser-ved on Fridays.
7	Ma and Tani-zaki (2019). Title: The day-of-the-week effect on bitcoin return and volatility.	Bitcoin (2013-2018)	OLS, Stochastic Volatility	The day-of-the-week effect in bit-coin returns changes across dif-ferent time periods sampled. Mon-days and Thursdays show notably higher volatilities. The significantly higher average bitcoin return on Mondays seems to be driven by the greater volatility on that day.

To be continued Table 1.

No.	Authors	Sample	Methodology	Results
8	Ma and Tanizaki (2019) Title: On the day-of-the-week effects of bitcoin markets: international evidence.	Bitcoin (2014-2018)	GARCH	Positive Monday effect and/or Thursday effect are observed when bitcoin is priced in CNY, USD, EUR, JPY, GBP, KRW, PLN, AUD, BRL, IDR, ILS, MYR, NGN, RUB, SGD, VEF and VND by employing the price data collected from various exchanges
9	Kaiser (2018)	Bitcoin, bitcoin cash, cardano, dash, ethereum, IOTA, litecoin, NEO, ripple, and stellar	OLS, Abdi and Ranaldo Method, Roger and Satchell (1991) Volatility Estimator, Student's t-test, ANOVA, Kruskal-Wallis, and regression analysis with dummy variables	The day-of-the-week effect is observed only for Bitcoin, and not the other cryptocurrencies exam-ined. Additionally, January consist-ently shows negative returns for bitcoin
10	Baur et al. (2019)	Bitcoin (2011-2017)		None persistent or recurring calendar-based anomalies in the cryptocurrency returns, such as time-of-day, day-of-the-week, or month-of-the-year effects
11	Kinateder and Papavas-siliou (2019)	Bitcoin (2013-2019)	AR(n)-GJR-GARCH(p,q) dummy model	No day-of-the-week effects
12	Qadan et al. (2021)	Bitcoin (2011-2020), litecoin (2013-2020), dash and monero (2014-2020), ripple and ethereum (2015-2020), and ethereum classic (2016-2020)	Regression analysis	Mondays tend to be associated with positive returns for Bitcoin and Nem
13	Khuntia and Pattanayak (2022)	Bitcoin, ripple, litecoin, monero, dash, dogecoin, bitshares, verge and bytecoin (2014-2019)	OLS, GARCH, and Kruskal-Wallis	Significant Monday effect, with a positive coefficient observed for all five cyptocurrencies examined (bitcoin, dash, ethereum, litecoin, and ripple)
14	Naz et al. (2023)	Bitcoin, dash, ethereum, litecoin, and ripple (2015-2020)	MGARCH	Monday effect was present across all 5 cryptocurrencies.
15	Mueller (2024)	Bitcoin, bitcoin cash, cardano, dash, ethereum, IOTA, litecoin, NEO, ripple, and stellar (2013-2024)	Student's t-test, ANOVA, Kruskal-Wallis, and regression analysis with dummy variables.	No robust evidence of the anomaly. Positive Monday effect but does not persist post 2015

4.2. Implications

Based on the literature review, several significant research gaps have emerged in the existing studies on the day-of-the-week effect within the cryptocurrency market. The current body of literature is relatively limited, comprising only 15 sources, which highlights the need for more in-depth exploration of this topic. This scarcity does not diminish the potential insights that could be gained; rather, it emphasizes the urgent

necessity for further investigation. The varied results from existing studies indicate a lack of consistency, complicating efforts to draw definitive conclusions about this phenomenon. For instance, while some studies have identified a pronounced "Monday effect" in bitcoin returns, as noted by researchers such as Kaiser (2018), Aharon and Qadan (2019), Caporale and Plastun (2019), and Qadan et al. (2021), findings regarding other cryptocurrencies like litecoin, ripple, and dash have shown more diverse and inconsistent results (Decourt et al., 2017; Kurihara & Fukushima, 2017; Dorfleitner & Lung, 2018; Baur et al., 2019; Ma & Tanizaki, 2019; and Khuntia & Pattanayak, 2022). This inconsistency suggests that the day-of-the-week effect may not be universally applicable across the broader cryptocurrency market, indicating a pressing need for more comprehensive research that includes a wider array of cryptocurrencies to better understand the factors influencing any observed anomalies and their persistence over time.

Furthermore, most studies have primarily focused on analyzing the day-of-the-week effect in terms of returns, with significantly less attention given to its potential impact on volatility and trading volume. This oversight presents a valuable opportunity for future research to investigate day-of-the-week patterns in these other market characteristics, which could provide critical insights into the underlying market dynamics and the potential for developing effective trading strategies. By expanding the analysis beyond mere returns, researchers can enhance their understanding of how the day-of-the-week effect manifests across various aspects of cryptocurrency markets. This comprehensive approach would contribute to a more nuanced understanding of market behavior, ultimately benefiting investors and market participants by informing their strategies and decision-making processes. As the cryptocurrency market continues to evolve, addressing these research gaps will be essential for advancing knowledge in this dynamic field.

4.3. Recommendations

In light of the identified research gaps, several recommendations for future studies are proposed to deepen our understanding of the day-of-the-week effect within the cryptocurrency market. First and foremost, it is essential to conduct research that includes a wider range of cryptocurrencies beyond just bitcoin. This expanded focus will help determine whether the day-of-the-week effect is a consistent phenomenon across various digital assets or if it shows significant variability among them. By examining multiple cryptocurrencies, researchers can develop a more comprehensive understanding of how different digital currencies respond to temporal market dynamics, potentially revealing unique patterns and anomalies specific to each asset.

Additionally, future research should investigate the impact of the day-of-the-week effect on other critical market characteristics, such as volatility and trading volume. Analyzing these dimensions can provide deeper insights into overall market behavior and may lead to the identification of innovative trading strategies that leverage day-of-the-week anomalies. For example, understanding how trading volume varies on different days could inform investors about optimal trading times, while insights into volatility patterns may assist in risk management and portfolio optimization. Furthermore, employing advanced statistical techniques and machine learning models could significantly enhance the robustness of the findings, offering a more accurate representation of the relationships between cryptocurrencies and the day-of-the-week effect. These sophisticated analytical tools can help uncover complex patterns that traditional methods might overlook.

Moreover, incorporating interdisciplinary approaches that draw from behavioral finance theories could enrich the analysis by examining how investor sentiment and trading behaviors influence the day-of-the-week effect in cryptocurrencies. Understanding the psychological factors at play, such as how emotions and cognitive biases impact trading decisions, can provide valuable context for the observed anomalies. This perspective may lead to more effective investment strategies, enabling investors to anticipate and react to market movements driven by collective investor behavior. By integrating insights from behavioral finance with empirical research on cryptocurrency returns, future studies can contribute to a more holistic understanding of market dynamics, ultimately benefiting both academic research and practical investment applications. As the cryptocurrency landscape continues to evolve, addressing these recommendations will be crucial for advancing knowledge in this dynamic field and enhancing the strategies employed by market participants.

V. CONCLUSION

In conclusion, this literature review serves to identify critical research gaps while also highlighting inconsistencies in existing findings regarding day-of-the-week effect within market of cryptocurrency. It emphasizes the substantial opportunities that lie ahead for further exploration and investigation. By addressing these identified gaps and pursuing the recommended avenues for future research, scholars can significantly enhance our understanding of the day-of-the-week effect and its broader implications for investment strategies and market efficiency in the rapidly evolving landscape of cryptocurrencies.

As cryptocurrency market further to expand and draw increasing interest from both investors and policymakers, there is a growing urgency for rigorous and insightful research in this domain. The dynamic and volatile nature of the cryptocurrency market, coupled with its unique behavioral patterns, demands a deeper examination of how temporal factors, such as the day of the week, influence asset returns and trading behaviors. By conducting comprehensive studies that incorporate a broader range of cryptocurrencies and consider various market characteristics, researchers can provide valuable insights that inform better investment decisions and enhance overall market understanding.

Furthermore, as the cryptocurrency market matures, understanding the day-of-the-week effect could play a crucial role in developing effective trading strategies and improving market efficiency. The findings from future research can aid investors in navigating this complex landscape, ultimately contributing to more informed decision-making processes. In light of these factors, the call for further investigation into the day-of-the-week effect is not only timely but essential for advancing knowledge in this exciting and rapidly changing field. The insights gained from such research will be instrumental in shaping the future of cryptocurrency investment and regulation, making it a vital area of study for scholars and practitioners alike.

REFERENCES

Abraham, A., & Ikenberry, D. L. (1994). The individual investor and the weekend effect. *The Journal of Financial and Quantitative Analysis*, 263-277.

Aggarwal, R., & Rivoli, P. (1989). Seasonal and day-of-the-week effects in four emerging stock markets. *The Financial Review*, 541-550.

Aharon, D., & Qadan, M. (2019). Bitcoin and the day-of-the-week effect. *Finance Research Letters*, 415-424.

Al-Khazali, O. (2008). The impact of thin trading on day-of-the-week effect: Evidence from the united Arab Emirates. *Review of Accounting & Finance*, 1-15.

Al-Khazali, O., Zoubi, T., & Koumanakos, E. (2010). The Saturday effect in emerging stock markets: A stochastic dominance approach. *International Journal of Emerging Markets*, 227-246.

Alt, R., Fortin, I., & Weinberger, S. (2011). The monday effect revisited: An alternative testing approach. *Journal of Empirical Finance*, 447-460.

Aydoğan, K., & Booth, G. (2003). Calendar anomalies in the Turkish foreign exchange. *Applied Financial Economics*, 353-360.

Baur, D., Cahill, D., Godfrey, K., & Liu, Z. (2019). Bitcoin time-of-day, day-of-week and month-of-year effects in returns and trading volume. *Finance Research Letters*, 78-92.

Berument, H., Coskun, M., & Sahin, A. (2007). Day of the week effect on foreign exchange market volatility: Evidence from Turkey. *Research in International Business and Finance*, 87–97.

Brusa, J., Hernandez, R., & Liu, P. (2011). Reverse weekend effect, trading volume, and illiquidity. *Managerial Finance*, 817-839.

Bush, P., & Stephens, J. (2016). The monday effect in the EUR/USD currency pair: Periods of EUR strength and weakness. *Journal of Behavioral & Experimental Finance*, 72–74.

Caporale, G. M., & Plastun, A. (2019). The day of the week effect in the cryptocurrency market. *Finance Research Letters*, 258-269.

Caporale, G. M., Gil-Alana, L., & Plastun, A. (2019). Long memory and data frequency in financial markets. *Journal of Statistical Computation & Simulation*, 1763–1779.

Caporale, G., & Zakirova, V. (2017). Calendar anomalies in the Russian stock market. *Russian Journal of Economics* , 101–108.

Chang, E., Pinegar, J., & Ravichandran, R. (1993). International evidence on the robustness of the day-of-the-week effect. *The Journal of Financial & Quantitative Analysis*, 497-513.

Chaum, D. (1983, December 18). *Blind signatures for untraceable payments* (pp. 199–203). Springer, Boston, MA.

Chen, H., & Singal, V. (2003). Role of speculative short sales in price formation: The case of the weekend effect. *The Journal of Finance*, 685-705.

Chia, R., & Lim, S. (2011). Stock market anomalies in south Africa and its neighbouring countries. *Economics Bulletin*, 3123-3137.

Chia, R. -J., Liew, V. -S., & Syed Khalid Wafa, S. (2008). Day-of-the-week effects in selected east Asian stock markets. *Economics Bulletin*, 1-13.

Chia, R. -J., Liew, V. -S., & Syed Khalid Wafa, S. (2015). The day-of-the-week effect in the Hang Seng index. *The Empirical Economics Letters*, 1-6.

Cho, Y. -H., Linton , O., & Whang, Y. -J. (2007). Are there monday effects in stock returns: A stochastic dominance approach. *Journal of Empirical Finance*, 736-755.

Connolly, R. (1989). An examination of the robustness of the weekend effect. *Journal of Financial & Quantitative Analysis*, 133-169.

Cross, F. (1973). The behavior of stock prices on fridays and mondays. *Financial Analysts Journal*, 67-69.

Decourt, R., Chohan, U., & Perugini, M. L. (2017). Bitcoin returns and the weekday effect. *La Rentabilidad De Bitcoin Y El*, 4-4.

Dorfleitner, G., & Lung, C. (2018). Cryptocurrencies from the perspective of euro investors: a reexamination of diversification benefits and a new day-of-the-week effect. *Journal of Risk & Financial Management*, 1-23.

du Toit, E., Hall, J. H., & Pradhan, R. P. (2018). The day-of-the-week effect: South African stock market indices. *African Journal of Economic & Management Studies*, 197-212.

Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 383-417.

Fields, M. (1931). Stock prices: A problem in verification. *Journal of Business of the University of Chicago*, 415-418.

French, K. R. (1980). Stock returns and the weekend effect. *Journal of Financial Economics*, 55-69.

Gibbons, M., & Hess, P. (1981). Day of the week effects and asset returns. *The Journal of Business*, 579-596.

Gkillas, K., Vortelinos, D., Babalos, V., & Wohar, M. (2021). Day-of-the-week effect and spread determinants: Some international evidence from equity markets. *International Review of Economics & Finance*, 268-288.

Hasan, M., Hassan, M., Rashid, M., Ali, M., & Hossain, M. (2022). Calendar anomalies in the stock markets: conventional vs Islamic stock indices. *Managerial Finance*, 258-276.

Jacobs, B., & Levy, K. (1988). Calendar anomalies: Abnormal returns at calendar turning points. *Financial Analysts Journal*, 28-39.

Jaffe, J., & Westerfield, R. (1985). Patterns in Japanese common stock returns: Day of the week and turn of the year. *The Journal of Financial & Quantitative Analysis*, 261-272.

Jaffe, J., & Westerfield, R. (1985). The week-end effect in common stock returns: The international evidence. *The Journal of Finance*, 433-454.

Jones, T., Fu, X., & Tang, T. (2009). Day-of-the-week effect in the seasoned equity offering discount. *Managerial Finance*, 48-62.

Jordan, S., & Jordan, B. (1991). Seasonality in daily bond returns. *Journal of Financial & Quantitative Analysis*, 269-285.

Kaiser, L. (2018). Seasonality in cryptocurrencies. *Finance Research Letters*, 232-238.

Kaiser, L. (2019). Seasonality in cryptocurrencies. *Finance Research Letters*, 232-238.

Kamara, A. (1997). New evidence on the monday seasonal in stock returns. *The Journal of Business*, 63-84.

Kato, K. (1990). Weekly patterns in Japanese stock returns. *Management Science*, 1031-1043.

Keef, S., & Roush, M. (2002). Presidential administration and day-of-the-week effects in the standard & poor's 500 stock index. *Review of Accounting & Finance*, 13-27.

Keim, D., & Stambaugh, R. (1984). A further investigation of the weekend effect in stock returns. *The Journal of Finance*, 819-835.

Khuntia, S., & Pattanayak, J. (2022). Adaptive calendar effects and volume of extra returns in the cryptocurrency. *International Journal of Emerging Market*, 2137-2165.

Kinateder, H., & Papavassiliou, V. (2019). Calendar effects in bitcoin returns and volatility. *Finance Research Letters*, 1-5.

Kreltszheim, D. (1999). Identifying the proceeds of electronic money fraud. *Information Management & Computer Security*, 223-231.

Kurihara, Y., & Fukushima, A. (2017). The market efficiency of bitcoin: A weekly anomaly perspective. *Journal of Applied Finance & Banking*, 57-64.

Lakonishok, J., & Maberly, E. (1990). The weekend effect: Trading patterns of individual and institutional investors. *The Journal of Finance*, 231-243.

Lakonishok, J., & Smidt, S. (1988). Are seasonal anomalies real? A ninety-year perspective. *The Review of Financial Studies*, 403-425.

Lean, H., Smyth, R., & Wong, W. (2007). Revisiting calendar anomalies in Asian stock markets using a stochastic dominance approach. *Journal of Multinational Financial Management*, 125-141.

Liano, K., & Gup, B. (1989). The day-of-the-week effect in stock returns over business cycles. *Financial Analysts Journal*, 74-77.

Liano, K., Liano, K., & Manakyan, H. (1999). Presidential administrations and the day-of-the-week effect in stock returns. *Review of Financial Economics*, 93–99.

Lim, S., & Chia, R.-J. (2010). Stock market calendar anomalies: Evidence from ASEAN-5 stock markets. *Economics Bulletin*, 996-1005.

Ma, D., & Tanizaki, H. (2019). On the day-of-the-week effects of bitcoin markets: International evidence. *China Finance Review International*, 455-478.

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

Mbanga, C. (2018). The day-of-the-week pattern of price clustering in bitcoin. *Applied Economics Letters*, 1-6.

Mbululu, D., & Chipeta, C. (2012). Day-of-the-week effect: Evidence from the nine economic sectors of the JSE. *Investment Analysts Journal*, 55-65.

Mensah, L., Bokpin, G., & Owusu-Antwi, G. (2016). Time your investment on the Ghana stock exchange (GSE). *African Journal of Economic & Management Studies*, 256-267.

Mueller, L. (2024). Revisiting seasonality in cryptocurrencies. *Finance Research Letters*, 1-13.

Nakamoto, S. (2008). *Bitcoin: A peer-to-peer electronic cash system.* Retrieved from www.bitcoin.org: https://bitcoin.org/bitcoin.pdf.

Naz, F., Sayyed, M., Rehman, R.-U., Naseem, M., Abdullah, S., & Ahmad, M. (2023). Calendar anomalies and market volatility in selected cryptocurrencies. *Cogent Business & Management*, 1-26.

Nik Muhammad, N., & Rahman, N. (2010). Efficient market hypothesis and market anomaly: Evidence from day-of-the week effect of Malaysian exchange. *International Journal of Economics & Finance*, 35-42.

Nippani, S., & Greenhut, J. (2011). Reversal of the weekend effect in Canada: An empirical analysis. *Managerial Finance*, 840-854.

Obalade, A., & Muzindutsi, P. -F. (2019). The adaptive market hypothesis and the day-of-the-week effect in African stock markets: The Markov switching model. *Comparative Economic Research, Central & Eastern Europe*, 45-162.

Philpot, J., & Peterson, C. (2011). A brief history and recent developments in day-of-the-week effect literature. *Managerial Finance*, 808-816.

Qadan, M., Aharon, D., & Eichel, R. (2021). Seasonal and calendar effects and the price efficiency of cryptocurrencies. *Finance Research Letters* , 1-7.

Raj, M., & Kumari, D. (2006). Day-of-the-week and other market anomalies in the Indian stock market. *International Journal of Emerging Markets*, 235-246.

Rogalski, R. (1984). A further investigation of the weekend effect in stock returns: Discussion. *The Journal of Finance*, 835-837.

Rogalski, R. (1984). New findings regarding day-of-the-week returns over trading and non-trading periods: A note. *The Journal of Finance*, 1603-1614.

Sias, R., & Starks, L. (1995). The day-of-the-week anomaly: The role of institutional investors. *Financial Analysts Journal*, 58-67.

Tadepalli, M., & Jain, R. (2018). Persistence of calendar anomalies: insights and perspectives from literature. *American Journal of Business*, 18-60.

Urquhart, A. (2016). The inefficiency of bitcoin. *Economics Letters*, 80-82.

Urquhart, A., & McGroarty, F. (2014). Calendar effects, market conditions and the adaptive market hypothesis: Evidence from long-run U.S. data. *International Review of Financial Analysis*, 154-166.

Wang, K., Li , Y., & Erickson , J. (1997). A new look at the Monday effect. *The Journal of Finance*, 2171-2186.

Xiong, X., Meng , Y., Xiao, L., & Shen, D. (2019). An empirical analysis of the adaptive market hypothesis with calendar effects: Evidence from China. *Finance Research Letters*, 321-333.

Yamori, N., & Kurihara, Y. (2004). The day-of-the-week effect in foreign exchange markets: multi-currency evidence. *Research in International Business & Finance*, 51-57.

Yardımcı, B., & Erdem, S. (2020). The day of the week effects in stock markets of countries with predominantly Muslim populations. *International Journal of Islamic & Middle Eastern Finance & Management*, 195-218.

Yuneline, M. H. (2019). Analysis of cryptocurrency's characteristics in four perspectives. *Journal of Asian Business & Economic Studies*, 206-219.

Zhang, J., Lai, Y., & Lin, J. (2017). The day-of-the-week effects of stock markets in different countries. *Finance Research Letters*, 47-62.