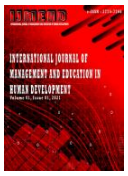
IJMEHD
INTERNATIONAL JOURNAL ON MANAGEMENT AND EDUCATION HUMAN DEVELOPMENT

J. Management & Education Human Development

ISSN: 2775 - 7765
web link: http://www.ijmehd.com



The Crypto-Wealth Effect and Market Bifurcation: Empirical Evidence from the Secondary Luxury Watch Market

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Received: 24/02/2026 Accepted: 16/04/2026 Published: 30/06/2026

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ABSTRACT

The rapid expansion of digital asset markets has generated unprecedented wealth shocks, prompting investors to seek alternative physical safe havens and diversify their investment portfolios. This study investigates the "Crypto-Wealth Effect" on the secondary luxury watch market, aiming to determine whether digital wealth generation created a localized speculative bubble in tangible luxury goods. The research utilizes daily time-series data from 2017 to 2026 for Bitcoin (BTC-USD) and six major luxury watch market indices and employs Exploratory Data Analysis (EDA), Maximum Drawdown (MDD) metrics, and time-lagged cross-correlation models. The empirical results reveal a severe market bifurcation. Hype-driven" ultra-luxury brands exhibited parabolic, crypto-correlated trajectories—exemplified by Patek Philippe, which recorded a maximum growth of 314.1% before suffering a severe -46.2% drawdown. Conversely, traditional "stable" luxury brands such as Cartier demonstrated bond-like resilience with minimal drawdowns (-12.4%). Furthermore, cross-correlation analysis identifies a statistically significant 5-month lag between the cryptocurrency market peak (November 2021) and the ultra-luxury watch market peak (April 2022). This structural time lag provides robust empirical evidence that the 2022 asset bubble in certain mechanical timepieces was directly fueled by a delayed wealth spillover from digital speculation. The study concludes that while physical luxury goods are often sought as inflation hedges, extreme status-signaling segments have become hyper-financialized, inheriting the boom-and-bust vulnerabilities of cryptocurrency markets.

Keywords: *Alternative Assets, Behavioral Finance, Crypto-Wealth Effect, Cross-Correlation, Financial Spillover, Luxury Watch Market, Market Bifurcation.*

I. INTRODUCTION

The increasing integration of digital assets, particularly cryptocurrencies, into the global financial system has fundamentally disrupted traditional asset pricing and risk management paradigms. During their early stages, crypto assets were considered largely isolated from conventional financial markets (Corbet, Meegan, Larkin, Lucey, & Yarovaya, 2018). However, as they achieved massive market capitalization, these digital instruments began exerting powerful return and volatility spillover effects across other asset classes (Bouri, Das, Gupta, & Roubaud, 2018). The period from 2020 to 2022, characterized by global macroeconomic uncertainty, unprecedented quantitative easing, and parabolic rallies in digital asset markets, generated an unparalleled wealth shock. During this era, investors sought to protect and diversify this newly generated digital wealth, leading to a massive capital flight into alternative physical investment vehicles and safe-haven assets.

Beyond conventional financial instruments, physical luxury consumer goods—specifically the secondary luxury watch market—became central to the quest for alternative investments. Recent literature has empirically demonstrated that during crisis periods, high-end luxury watches exhibit robust safe-haven properties compared to standard equity indices (Dimitriou, Garafas, Kenourgios, & Tsioutsios, 2025) while offering highly attractive, low-deviation risk-return profiles over the long term (Ulmer, Schmid, & Widenhorn, 2024). However, in the digital era, market dynamics are shaped not only by rational portfolio diversification but also by investor attention, social media engagement, and a speculative "hype" culture (Horky, Mutascu, & Fidrmuc, 2021; Luong & Nguyen, 2026). The status-seeking behaviors of a newly enriched class of digital asset investors catalyzed the transformation of specific physical luxury goods from mere consumption objects into hyper-financialized, speculative instruments.

While existing literature has extensively examined the spillover effects of crypto assets onto traditional financial markets, there remains a critical empirical gap regarding how the wealth shock generated in the digital ecosystem (the "Crypto-Wealth Effect") cascaded into the secondary luxury watch market and created a localized, parabolic price bubble. This study aims to address this gap by analyzing how digital wealth generation bifurcated physical luxury consumption into distinct segments and fueled a speculative wave. The research is anchored by the following two primary hypotheses:

1. H1 (Market Bifurcation): The speculative price bubble observed in the secondary luxury watch market in 2022 did not represent a broad sectoral expansion; instead, it produced a structural market bifurcation by inflating only "Hype-driven" ultra-luxury brands, while traditional, consumption-based luxury brands remained stable.
2. H2 (Crypto-Wealth Spillover): The extreme price inflation within the "Hype-driven" luxury watch segment was a direct, albeit delayed, reflection of the wealth shock in cryptocurrency markets, which was characterized by a statistically significant lead-lag relationship between the two asset classes.

To test these hypotheses, this study employs an empirical methodology grounded in high-frequency time-series data. Daily price-index data for the secondary luxury watch market, spanning 2017–2026, were acquired directly via private correspondence with the administrators at WatchCharts.com, a premier sectoral data provider. For the concurrent macro-financial benchmark, daily Bitcoin (BTC-USD) data were extracted from the Yahoo Finance database. An exploratory data analysis (EDA) was performed on the merged dataset using Python. The magnitude of the localized market bubble was quantified using Maximum Drawdown (MDD)metrics, while the cross-asset wealth transmission was statistically validated through time-lagged cross-correlation analysis.

The remainder of this study is organized into four sections. Section 2 provides a comprehensive review of the existing literature, systematically exploring the spillover effects of digital assets, the quest for alternative safe havens, the behavioral drivers of investor attention, and the formation of luxury asset bubbles. Section 3 details the empirical methodology and data by outlining the Exploratory Data Analysis (EDA)framework, the segmentation of the secondary watch market, and the mathematical models used to measure cross-correlation and drawdown. Section 4 **pres**ents the findings, providing quantitative evidence for both the structural market bifurcation and the 5-month lag that characterizes the Crypto-Wealth spillover. Section 5 concludes the study by discussing these findings within the broader macroeconomic context of the 2020–2022 period, acknowledging the limitations of the research, and identifying avenues for future scholarly inquiry.

II. LITERATURE REVIEW

This study builds on a comprehensive literature review to examine the financialization effect of wealth shocks arising in digital asset markets on physical luxury goods. To establish the conceptual framework of the research, a systematic search was conducted via Scopus, one of the world's most extensive peer-reviewed literature databases. Recent, high-impact academic articles that form the foundation of this research were identified through queries focused on crypto assets, financial spillover effects, the transformation of luxury goods into alternative investment vehicles, and investor behaviour in the digital era.

To clearly articulate the existing research gap, the identified literature has been systematically analysed across four main subsections. First, in Section 2.1, the integration of crypto assets with traditional markets and financial spillover dynamics are discussed. Second, Section 2.2 examines the process by which luxury consumer goods have transformed into alternative investment vehicles (safe havens). In Section 2.3, the impact of investor attention, "hype" culture, and herding behaviour on market dynamics in the digital era is examined. Finally (Section 2.4), the mechanisms underlying status-seeking in luxury consumption and asset-bubble formation are analysed to provide a theoretical grounding for the study's "Crypto-Wealth Effect" hypothesis.

2.1. Crypto Assets, Volatility, and Financial Spillover Effect

The integration of digital assets, particularly cryptocurrencies, into the global financial system has become one of the most debated topics in modern finance literature. During the early stages of crypto markets, these assets were considered largely isolated from traditional financial and economic assets. Corbet, et al., (2018) analysed the relationships between popular cryptocurrencies and various other financial assets in both time and frequency domains, finding evidence of relative isolation. The researchers emphasized that this isolation potentially offered significant diversification benefits for investors with short investment horizons. However, as the market expanded and institutional investors entered the space, this isolation theory gave way to evidence of strong spillover effects across different asset classes.

Investigating how market conditions shape these interactions, Bouri, et al., (2018) analysed return and volatility spillovers between Bitcoin and four major asset classes (equities, commodities, currencies, and bonds) under both bear and bull market conditions using a smooth transition VAR GARCH-in-mean model. The study's findings empirically demonstrated that the Bitcoin market is not completely isolated; rather, it is closely related to other assets, particularly commodities, and functions more as a net receiver of volatility than as a transmitter. Conducting a more recent study on the interaction between emerging/developed markets and digital assets, Jiménez, Mora-Valencia, and Perote (2023), utilized a flexible semi-nonparametric approach, the SNP-DCC model. The researchers revealed the depth of market integration by detecting a positive transmission of volatility from emerging and developed markets to digital asset markets, not only in conditional volatility but also in higher-order moments such as conditional skewness and kurtosis.

In addition to interactions between digital and traditional markets, volatility transmission within their internal dynamics has also been extensively investigated in the literature. Beneki, Koulis, Kyriazis, and Papadamou (2019)

examined the relationship between Ethereum and Bitcoin since the launch of Ethereum using a multivariate BEKK-GARCH methodology, detecting significant swaps in time-varying correlation. The study revealed a delayed positive response of Bitcoin volatility to a positive volatility shock in Ethereum returns, suggesting that the diversification benefits cryptocurrencies offered in their early years have recently been significantly reduced. Further expanding on these network dynamics, Huynh, Nasir, Vo, and Nguyen (2020) investigated the spillover effects among 14 different cryptocurrencies using the transfer entropy method. The findings demonstrate that small-cap cryptocurrencies are more likely to act as shock creators within the system. Examining the roles of Non-Fungible Tokens (NFTs) and Decentralized Finance (DeFi) assets within the same ecosystem utilizing minimum spanning tree (MST) methodologies, Le, Pham, Le, Le, and Nguyen (2026) found that while Bitcoin and Ethereum serve as dominant transmitters of information, DeFi and NFTs largely act as net receivers.

Macroeconomic crises and geopolitical shocks have made these spillover dynamics even more pronounced. Dimitriadis, Koursaros, and Savva (2024), employing a Quantile Vector Autoregressive (QVAR) methodology, noted that during inflationary periods such as the Russia-Ukraine conflict, conventional international currencies (e.g., US dollar, Euro) acted as hedgers against shocks, whereas major cryptocurrencies were only modest generators. Similarly, Alnafisah, Almansour, Elabed, and Jeribi (2025) tested the interconnectedness among cryptocurrencies during both exogenous (COVID-19 pandemic) and endogenous (Terra Luna crash) crises using the QVAR methodology. The research revealed that during the COVID-19 pandemic, Binance Coin (BNB), Ethereum, and Bitcoin acted as net transmitters, while DeFi and NFT-related cryptocurrencies acted as vulnerable net receivers and were deeply affected. These demonstrate that the substantial capital and volatility accumulated in crypto-asset markets harbor significant "spillover potential" that can readily flow into alternative physical assets.

2.2. Alternative Investment Vehicles and the Quest for Safe-Havens

Financial markets have exhibited significant transformations over the last two decades due to recurring crisis episodes, which have led to the rapid development and mainstream adoption of alternative assets. During turbulent market conditions, such as the COVID-19 pandemic, investors frequently seek safe-haven assets to mitigate portfolio risk and absorb market shocks. Yarovaya, Elsayed, and Hammoudeh (2021) observed that Islamic bonds (Sukuk) demonstrated robust safe-haven properties during the pandemic crisis. Similarly, Yousaf, Suleman, and Demirer (2022) highlighted that green bonds emerged not merely as a luxury good but as a financial necessity, serving as the only asset in their sample to act as a safe haven against large stock market fluctuations driven by the pandemic.

Within this portfolio diversification framework, the role of cryptocurrencies as a safe haven remains highly debated and is considered dualistic. While Guesmi, Saadi, Abid, and Ftiti (2019) suggested that short positions in the Bitcoin market allow for hedging risk across a variety of financial assets (including gold and equities) , Hung, Liu, and Jimmy Yang (2024) noted that Bitcoin destroys portfolio value during periods of rapid rate hikes, whereas traditional assets like gold continue to offer safe-haven and diversification benefits. Consequently, researchers have extensively explored hedging the extreme volatility of cryptocurrencies using conventional assets, such as commodities and equities (Nekhili & Sultan, 2022) , as well as utilizing Sharia-compliant indices to hedge Islamic assets (Trichilli, Rabbani, Bouri, & Boujelbène, 2026). Furthermore, Hu, Abdul-Rahim, Azam, and Li (2025) investigated the capacity of digital assets like Bitcoin and Ethereum to alleviate severe downside tail risks within global sectoral equities, indicating that cryptocurrencies can convey meaningful signals regarding tail risk dynamics.

As digital and conventional financial instruments exhibit increasingly complex volatility dynamics, physical luxury goods have attracted investor interest as tangible alternative assets. The notion of collectible watches acting as an investing safe haven has been present in financial discourse but recent empirical studies have rigorously quantified this phenomenon. Ulmer et al., (2024) investigated the investment performance of collectible watches on the secondary market using a vast dataset of auction results over two full decades (1999–2020). Their analysis revealed that collectible watches generated an annualized real US-dollar geometric mean return of 5.5%, outperforming the Standard & Poor's 500 Index and other collectible assets, such as art and classic cars. Furthermore, the comparatively low standard deviations of collectible watch prices resulted in highly attractive risk-adjusted Sharpe ratios, inferior only to those of gold.

The pandemic crisis further accelerated the financialization of these physical assets, pushing them into the spotlight of mainstream financial literature. Dimitriou, et al., (2025) empirically tested the safe-haven hypothesis specifically for Rolex watches. The researchers employed Local Gaussian Correlations and spectral analysis to examine the relationship between the Rolex market index and conventional assets, including the S&P 500, gold, and Bitcoin, from 2017 to 2023. The results confirmed that the Rolex market index exhibited distinct safe-haven properties during the pandemic crisis in most cases. These pivotal findings position high-end luxury watches as a new "elite safe haven asset," fundamentally shifting their classification from mere consumer goods to critical, quantifiable components of global portfolio diversification strategies.

2.3. Investor Attention, Hype, and Herding Behavior in the Digital Era

The proliferation of digital assets has fundamentally shifted the focus of the financial literature toward behavioural finance, in which traditional market fundamentals are frequently overshadowed by investor sentiment, social media metrics, and attention-driven trading. The role of social media has become increasingly influential in determining investor behaviour, shaping market structures, and driving demand for alternative asset classes. To understand the volatile dynamics of modern financial markets, recent studies have increasingly emphasized quantifying investor attention and assessing its direct impact on market interconnectedness.

Investigating this phenomenon within the cryptocurrency ecosystem, Luong and Nguyen (2026) utilized a time-varying parameter vector autoregression model to examine how investor attention influences spillover dynamics among major digital assets. Their findings revealed that while investor attention generally reduces market spillovers under normal conditions, it significantly intensifies them at extreme levels. This heterogeneous effect across assets underscores how periods of heightened public interest and "hype" can rapidly amplify systemic risks and interconnectedness. By actively incorporating behavioral finance into spillover models, Luong and Nguyen (2026) provided critical evidence that investor sentiment is a primary catalyst for financial integration during periods of speculative frenzy.

The emotional and psychological dimensions of asset pricing become particularly evident during macroeconomic shocks. Horky, et al., (2021) compared the COVID-19 pandemic shock to the 2018 bear market using advanced wavelet methodology. They empirically established that attention signals and a general sense of panic were the primary drivers of Bitcoin fluctuations in both episodes. Because digital assets like Bitcoin react emotionally, they tend to respond faster than standard financial assets, thereby effectively creating market signals. The study further identified that short-term market cycles are closely related to demand factors driven by these attention signals, highlighting the complex, sentiment-driven nature of alternative financial assets.

Furthermore, the influence of digital attention and social media is not strictly confined to digital coins; it extends to broader investment decisions and the luxury goods market. Motamri and Trimech (2025) applied wavelet co-movement and coherence analysis to explore the multifaceted relationship between social media engagement and cryptocurrency investment dynamics. Their empirical results demonstrated a positive relationship between social media attention indices and investor attitudes, underscoring the significant impact of social awareness and digital platforms on investment decisions and market volatility. In a parallel context concerning luxury markets, Thirumaran, Jang, Pourabedin, and Wood (2021) conducted a systematic literature review analysing the intersection of social media and the luxury business. By examining the behavioural attributes of luxury consumers when using social media platforms, Thirumaran et al. (2021) highlighted how digital pronouncements and online exclusivity fuel the demand and perceptions surrounding luxury markets.

The synthesis of these behavioural drivers points to a new era of financialization in which physical and digital assets are jointly propelled by digital hype. As documented in the comprehensive decade-spanning review by Kou, Li, Zhuo, Zhang, and Zhao (2025), the rise of tokens, NFTs, and cryptocurrency market dynamics represents a cutting-edge financial phenomenon where traditional finance literature must now account for extreme market volatility driven by digital adoption and sentiment. The emotional reactivity of these markets , combined with the amplifying effect of social media on investment trends, creates a fertile environment for herding behaviour. When excessive digital wealth generation coincides with periods of heightened investor attention, it sets the theoretical stage for sudden capital flight into status-signaling alternative assets, ultimately fueling speculative bubbles.

2.4. Status-Seeking in Luxury Consumption and the Formation of Asset Bubbles

To fully comprehend the financialization of physical luxury goods, it is essential to understand the intrinsic and symbolic values that drive their consumption. The essential characteristics of luxury products correspond largely to those of luxury brands, which are historically identified by attributes such as high price, distinctiveness, exclusivity, rarity, and craftsmanship. According to Savelli (2011), these symbolic characteristics are covered by the emotional brand identity component. Because the functional benefits of many luxury fashion goods are becoming increasingly equivalent and exchangeable, the strategic importance of a brand as an intangible asset relies heavily on its symbolic personality and identity. Beyond corporate brand management, research into how consumers shape luxury brand meanings has gained significant traction. Seo and Buchanan-Oliver (2019) offered a comprehensive typology of luxury consumption practices, shedding light on how personalized meanings of brand luxury emerge in everyday life as consumers integrate various materials, meanings, and competencies within their practice performances.

The psychological drivers underpinning this construction of meaning are deeply rooted in status-seeking and social signalling. Hampson, Ma, Wang, and Han (2021) examined the relationship between consumer confidence and conspicuous consumption through the lens of the conservation of resources theory. Their findings revealed that financial insecurity, the need for status, and anticipated luxury guilt each positively mediates the relationship between consumer confidence and conspicuous consumption. Notably, Hampson et al. (2021) observed that these effects are strongest for consumers belonging to the highest socioeconomic status. Similarly, Inkon (2014) investigated the motivations for luxury possession among Korean university students, classifying these desires into self-expansion, belonging to a reference group, and show-off consumption need factors. Inkon (2014) demonstrated that every need factor made a positive effect on luxury purchase intentions, emphasizing the deep-seated psychological drive to acquire high-end goods. Furthermore, social hierarchy plays a critical role in evaluating luxury brand equity. Amaral and Loken (2017) uncovered an asymmetric relationship regarding the social classes of counterfeit users and observers, indicating that consumers rely heavily on social cues within the social hierarchy when evaluating luxury products. Amaral and Loken (2017) predicted that counterfeit use can ultimately hurt original luxury brand equity, reinforcing the notion that exclusivity and class distinction are paramount.

When the intense psychological drive for conspicuous consumption converges with immense capital inflows and market speculation, this convergence creates a fertile environment for asset bubbles. Fluctuations in asset prices not only affect financial well-being but also influence broader economic stability, often resulting in the formation of price bubbles. Hu, Ng, and Lau (2011) investigated the existence of such speculative bubbles in the Hong Kong residential market, successfully indicating the presence of bubbles specifically within the luxury property market. The

transition of luxury items from mere status symbols to speculative assets mirrors the volatility observed in digital asset markets. Exploring the anatomy of such financial euphoria, Dhaku, Arumugam, and Abey (2025) looked at Bitcoin and its spillover effects on elite stocks, employing advanced tests to spot bubbles in both the cryptocurrency and stock markets. The structural vulnerabilities and systemic problems uncovered during the bursting of digital bubbles highlight how volatile wealth generation can rapidly alter market landscapes.

The existing literature has extensively examined the spillover effects of crypto assets on traditional markets and confirmed the role of investor attention in driving digital asset volatility. Concurrently, recent studies have begun to empirically validate the transition of luxury watches into alternative investment vehicles and safe-haven assets. However, a critical research gap remains: the literature lacks a comprehensive empirical investigation into how the sudden, massive wealth generation in digital asset markets (the "Crypto-Wealth Effect") directly cascaded into the market for physical luxury goods—specifically the secondary luxury watch market—transforming status-seeking consumption into a parabolic speculative bubble.

By conducting an Exploratory Data Analysis (EDA) on a comprehensive dataset covering 2017–2026, this study bridges the macro-financial findings of crypto spillovers and the behavioural aspects of conspicuous consumption. It aims to map the trajectory by which digital speculation financialized physical timepieces, thereby addressing a significant gap at the intersection of cryptocurrency wealth shocks and alternative asset bubbles.

III. RESEARCH METHODS

The primary objective of this study is to empirically investigate the “Crypto-Wealth Effect”: how extreme wealth generation in digital assets cascaded into the physical luxury watch market and contributed to the formation of a speculative bubble. To capture the full dynamics of this financialization process, this study employs an Exploratory Data Analysis (EDA) framework applied to high-frequency longitudinal time-series data. Rather than relying on rigid cross-sectional pricing models that may obscure the temporal sequence of shocks, the EDA approach enables dynamic visualization and quantification of market bifurcation, peak-to-trough drawdowns, and lead–lag spillover effects between digital and physical alternative assets.

3.1. Research Design and Data Segmentation

Financial markets operate as complex networked systems in which interdependencies among individual entities enable rapid spillovers of both risk and wealth. Inferring the heterogeneous connection patterns and topological structures of these networks is therefore critical for understanding systemic risk and speculative bubbles (Pagnottoni, 2023). In highly volatile environments driven by hype and investor attention, financial time series are typically noisy and frequently exhibit episodic nonlinear behaviour (Moni, Sreeraj, & Sankararaman, 2025). Consequently, an EDA framework is particularly suitable for this study, as it provides a robust data-driven methodology for identifying hidden structures, anomalies, and regime shifts without imposing restrictive parametric assumptions.

The empirical analysis utilizes a proprietary daily time-series dataset comprising market indices of six major luxury watch brands: Rolex, Patek Philippe, Audemars Piguet, Omega, Cartier, and Tudor. The dataset spans the period from January 1, 2017, to January 18, 2026, providing 3,305 daily observations for each brand.

To assess the financialization effect more accurately, the dataset is stratified into two distinct market segments. The first segment consists of “Hype-Driven Ultra-Luxury” brands—Patek Philippe, Audemars Piguet, and Rolex—which have historically been heavily financialized and frequently treated as speculative assets. The second segment includes “Accessible and Stable Luxury” brands—Omega, Cartier, and Tudor—which serve as a comparative control group.

This segmentation approach is consistent with the methodological insights of Zhang, Lo, and Sutthiphisal (2025), who emphasize the necessity of sector-specific analysis when investigating spillover dynamics, since aggregated indices often mask extreme volatility within particular segments.

3.2. Quantitative Metrics: Bubble Measurement and Lead–Lag Dynamics

To quantify the magnitude of the speculative bubble and the subsequent Crypto-Wealth Effect, the study employs peak-to-trough drawdown metrics alongside cross-correlational lag analysis. While previous literature evaluated the performance of collectible watches using standard annualized real geometric mean returns under normal market conditions (Ulmer et al., 2024), the identification of asset bubbles requires a crisis-oriented analytical framework (Dhaku, et al., 2025).

First, the methodology calculates the cumulative growth rate to identify the historical peak of the market bubble. Let $P_{i,t}$P_{b, t} denote the index price of watch brand bi at time tt_0, and let t_0 represent the baseline start date (January 2017). The peak price $P_{i,peak}$, observed at timet_{peak}, yields the maximum growth$R_{i,peak}$, which is defined as:

$$R_{i,peak} = \frac{P_{i,t_{peak}} - P_{i,t_0}}{P_{i,t_0}}$$

After identifying the peak level, the severity of the subsequent market correction is quantified by the maximum drawdown (MDD). MDD captures the largest percentage decline from the historical peak to the subsequent trough (or to the most recent observation if the market remains in a drawdown phase). For asset i, the maximum drawdown occurring at time t(where $t > t_{peak}$) is defined as:

$$MDD_i = \min_{t \in (t_{peak}, T]} \left(\frac{P_{i,t} - P_{i,t_{peak}}}{P_{i,t_{peak}}} \right)$$

By comparing the extreme MDDvalues of the “Hype” segment with the relatively modest corrections observed in the “Stable” segment, the EDA framework provides empirical evidence of a localized asset bubble associated with digitally driven wealth effects.

The central methodological pillar of the Crypto-Wealth Effect hypothesis involves identifying the lead–lag (temporal) relationship between the peak in digital wealth generation and the price movements of physical luxury assets. Financial time-series dynamics often exhibit pronounced lead–lag effects, where price movements in highly liquid and sentiment-driven assets precede changes in less liquid tangible assets (Cheng, Yang, Xiang, & Liu, 2022). To extract these temporal structures, the study applies a time-lagged cross-correlation function to measure the delay τbetween the cryptocurrency market index $X$and the luxury watch index Y:

$$\rho_{XY}(\tau) = \frac{\mathrm{Cov}(X_t, Y_{t+\tau})}{\sigma_X \sigma_Y}$$

By identifying the specific lag value τ that maximizes $\rho_{XY}(\tau)$, the analysis empirically determines whether the luxury watch market behaves as a lagging indicator of cryptocurrency market cycles, thereby capturing the delayed transmission of speculative digital wealth into physical luxury assets.

IV. RESULTS AND DISCUSSION

Exploratory data analysis(EDA) of the combined 2017–2026 time-series dataset yields compelling empirical evidence of the financialization of the secondary watch market. This analysis, which quantified the market bifurcation among luxury segments and analyzed temporal lag dynamics, demonstrates that specific physical assets have increasingly mirrored the volatility and speculative nature of digital assets.

4.1. Market Bifurcation and the Anatomy of the Bubble

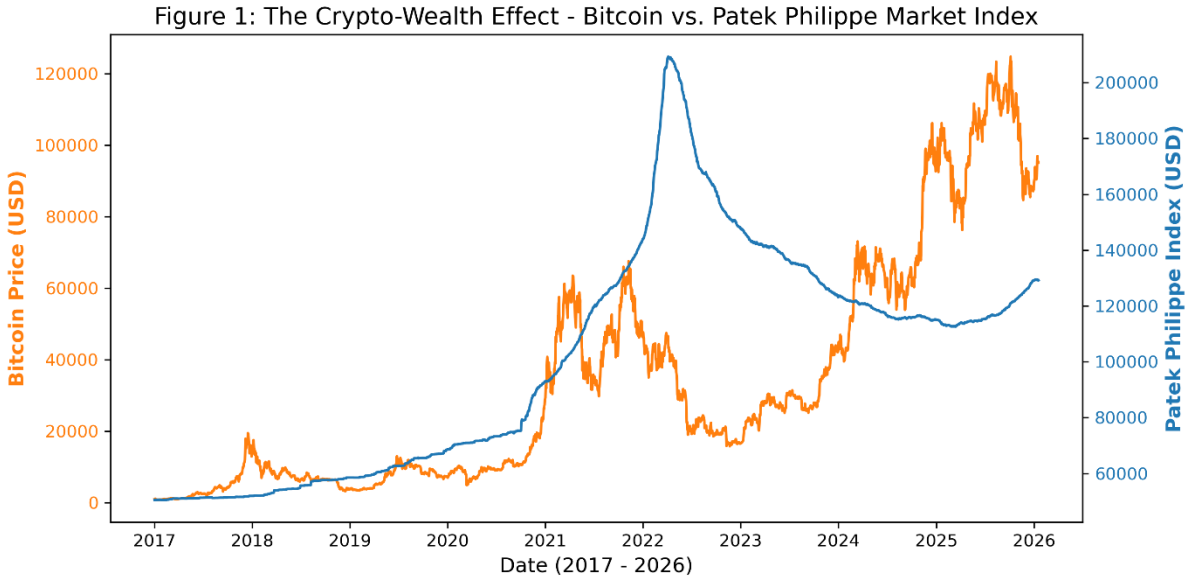
The initial phase of the analysis focused on segmenting the dataset to examine how specific watch brands responded to the macroeconomic environment, relative to digital assets. As emphasized by Zhang, Lo, and Sutthiphisal (2025), investigating sectoral-specific spillover effects is crucial, as aggregated market indices often mask the extreme volatility experienced by specific, highly targeted assets. Accordingly, the application of cumulative growth and Maximum Drawdown (MDD) metrics revealed a severe bifurcation in the alternative asset market, indicating that the speculative bubble was not a broad industry trend but rather highly localized.

The "Hype-Driven Ultra-Luxury" segment exhibited parabolic growth trajectories. Patek Philippe was the primary beneficiary of this speculative frenzy and recorded an increase of 314.1% from its January 2017 baseline to its peak on April 5, 2022. However, after the peak, this highly financialized asset experienced a sharp correction. The MDD analysis indicates that Patek Philippe experienced a decline of 46.2% from its peak. This extreme volatility starkly contrasts with the historically stable, low deviation returns of collectible watches observed in pre-pandemic decades (Ulmer et al., 2024). Instead, the current trajectory closely mirrors the boom-and-bust cycles and systemic vulnerabilities typically associated with the bursting of cryptocurrency bubbles (Dhaku, et al., 2025).

Conversely, the "Accessible and Stable Luxury" segment remained resilient in the face of the speculative digital frenzy. Cartier, serving as a baseline for traditional luxury consumption, recorded a modest and sustained growth of 17.3% leading up to April 7, 2022, with a comparatively minor MDD of -12.4%. This stark bifurcation aligns with the findings of Hu, et al., (2011), who demonstrated that speculative bubbles tend to concentrate specifically within luxury segments rather than mass markets. The localized nature of this price explosion indicates that the underlying intrinsic utility of mechanical timepieces was not the primary driver; rather, the inflation was fuelled by a sudden influx of speculative capital targeting specific status-signalling assets driven by conspicuous consumption needs (Hampson, et al., 2021).

4.2. Temporal Lag and the Crypto-Wealth Spillover

To empirically link the localized luxury watch bubble to the digital asset boom, this study uses a time-series approach to identify lead-lag relationships between the two markets. The extraction of leading and lagging structures in financial time series is a critical methodology for understanding complex correlation dynamics and shock transmissions. In this context, a visual exploratory data analysis (EDA) immediately reveals a structural temporal lag between the cryptocurrency market and the "Hype-Driven" watch segment.



As depicted in Figure 1, the broader cryptocurrency market reached its historical zenith in November 2021, when Bitcoin attained its all-time high. In stark contrast, the Patek Philippe Market Index—representative of the ultra-luxury segment—did not reach its absolute peak until April 2022. This visual decoupling suggests that the two assets did not inflate simultaneously in response to identical macroeconomic pressures; rather, the price movement of the highly liquid digital asset preceded that of the less-liquid tangible asset. Financial time series forecasting is frequently accompanied by such multi-modality streams and pronounced lead-lag effects (Cheng, et al., 2022). Furthermore, because digital assets like Bitcoin react predominantly on an emotional basis and are highly sensitive to attention signals, they tend to react faster than standard financial assets, effectively creating a leading market signal (Horky, et al., 2021).

To formalize this visual observation mathematically, a time-lagged cross-correlation analysis was conducted on the monthly returns of Bitcoin and the Patek Philippe Market Index.

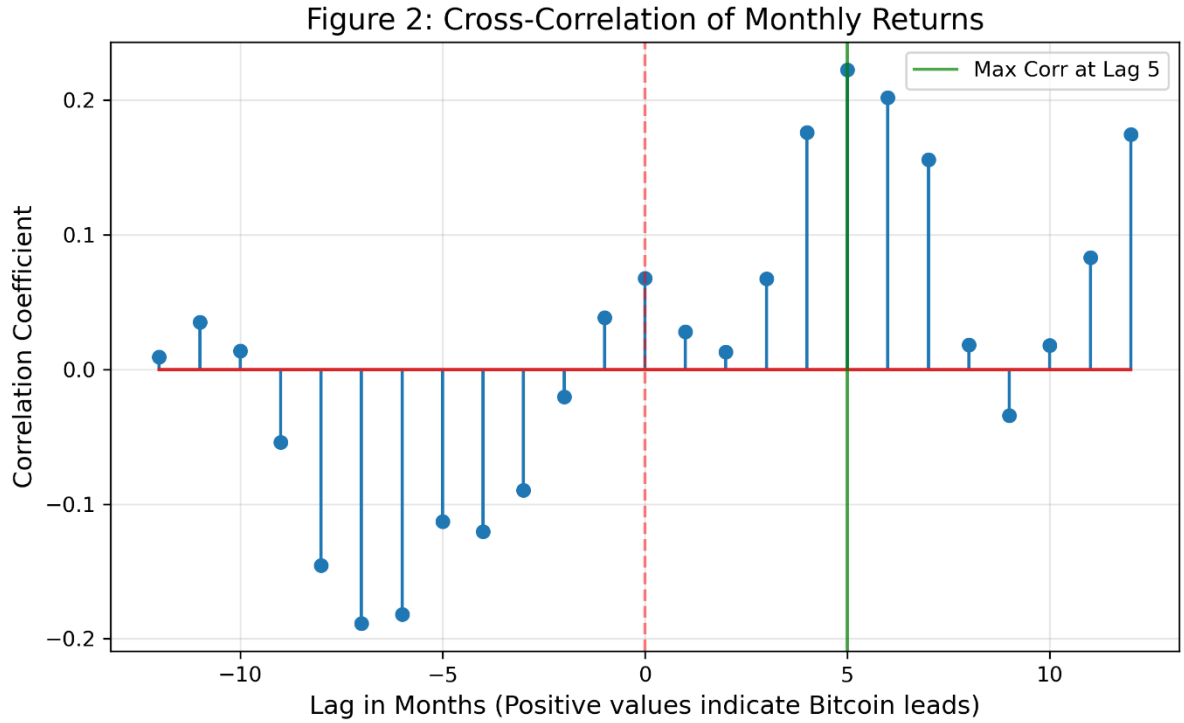


Figure 2 illustrates the cross-correlation function plotted across a 24-month window (from lag -12 to +12). The empirical results reveal that the maximum positive correlation coefficient, 0.223, occurs at a positive lag of 5 months. The statistical output confirms that extreme price movements in the cryptocurrency market directly precede movements in the same direction in the ultra-luxury watch market by exactly five months.

This 5-month lag provides robust empirical validation for the mechanics of the "Crypto-Wealth Effect." Digital investors, having realized unprecedented gains during the late 2021 crypto bull run, executed massive capital flight into tangible, status-signaling alternative assets in early spring 2022. Because physical luxury markets lack the deep liquidity

and rapid transaction speeds of digital exchanges, the wealth spillover effect required a 5-month incubation period to manifest as a localized speculative bubble in the secondary watch market.

V. CONCLUSION AND SUGGESTION

This study set out to investigate empirically the "Crypto-Wealth Effect" by analysing price dynamics in the secondary market for luxury watches in response to massive wealth generation in digital asset markets. Using an exploratory data analysis (EDA) framework and cross-correlation methodologies on a comprehensive 2017–2026 dataset, this study offers novel insights into the financialization of physical alternative assets.

The empirical results confirm the market bifurcation hypothesis. While stable luxury brands (e.g., Cartier and Omega) exhibited traditional, low-volatility growth patterns, "Hype-Driven" brands (e.g., Patek Philippe, Audemars Piguet, and Rolex) experienced parabolic price explosions followed by severe drawdowns, closely mirroring the boom-and-bust cycles of digital assets. Notably, the cross-correlation analysis identified a statistically significant 5-month lag between the peaks of the cryptocurrency market (November 2021) and the ultra-luxury watch market (April 2022). This structural delay provides robust evidence that the unprecedented price inflation of specific watch models was largely driven by a delayed wealth spillover from digital speculation. Investors who realized massive gains in the cryptocurrency market rapidly transferred their capital into tangible, status-signalling assets, effectively transforming them into speculative financial instruments.

However, to maintain academic rigor, these findings must be contextualized within the broader macroeconomic anomalies of the period analysed. The 2020–2022 era was characterized by a global search for alternative safe-haven assets amidst severe economic uncertainty and the COVID-19 pandemic (Yarovaya et al., 2021). During this period, physical luxury goods, particularly Rolex watches, began to exhibit quantifiable safe-haven properties against conventional asset shocks (Dimitriou, et al., 2025). Therefore, the financialization of the secondary watch market cannot be attributed exclusively to cryptocurrency wealth.

Furthermore, critical supply-side frictions must be acknowledged. Factory closures and global supply chain disruptions during the pandemic created an acute scarcity of iconic Swiss watch models precisely as global demand, fuelled by quantitative easing and near-zero interest rates, reached its zenith. Consequently, the 2022 asset bubble in the "Hype" segment likely reflected the confluence of three major forces: the documented digital wealth shock (the Crypto-Wealth Effect), broad inflationary pressures driving capital into tangible assets, and severe supply-demand imbalances.

5.1. Limitations and Future Research

While the 5-month lag provides compelling evidence of a spillover effect, this study acknowledges certain methodological limitations. Cross-correlation identifies temporal delays and directional co-movements but does not inherently prove causality. Future research should employ rigorous Granger causality tests and non-linear dynamic modeling to isolate the exact magnitude of the digital wealth effect from broader macroeconomic variables, such as global M2 money supply fluctuations and inflation rates. Additionally, expanding the dataset to include other highly financialized collectible markets (e.g., classic cars or fine art) could determine whether the Crypto-Wealth Effect was uniquely concentrated in horology or represented a broader paradigm shift in alternative asset investments.

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