

Impact of Cryptocurrency Adoption on Various Financial Markets in Pakistan.

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Article History:

Submitted: Feb 10, 2024

Revised: April 22, 2024

Accepted: May 19, 2024

Published online: June 30, 2025

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A B S T R A C T

Purpose- The purpose of this study is to examine how the adoption of major cryptocurrencies affects the financial markets of Pakistan. It focuses on three key areas: the gold market, the stock market (KSE-100 index), and the bond market.

Design- This research employs a quantitative approach, utilizing regression analysis to investigate the relationship between the adoption of five major cryptocurrencies (Bitcoin, Ethereum, Binance Coin, Cardano, and Ripple) and their impact on gold prices, stock market performance, and bond price movements in Pakistan.

Findings- The results show that cryptocurrencies do affect financial markets, but each coin has a different impact. Bitcoin and Binance Coin increase gold prices, while Cardano and Ripple decrease them. In the stock market, Bitcoin lowers the index, but Ethereum and Ripple increase it. Cardano and Binance Coin have little to no impact on stocks. For bonds, Cardano and Ripple lower prices, while Binance Coin and Ethereum raise them. Bitcoin has a small negative effect on bonds.

Originality and Value- This study contribute significantly to reshaping the investment culture in Pakistan, particularly in the context of evolving regulatory frameworks, creating awareness about digital currencies especially cryptocurrencies so that financial investors, portfolio and fund managers can take better informed decisions.

Keywords: Cryptocurrency, Blockchain Technology, Financial Inclusion, Bitcoin, Ethereum, Gold Market, Stock Market, Bond Market

JEL Classification codes: G0, G1, G2, O3

1 | INTRODUCTION

In the modern world, it is possible to state that both conventional and digital resources are significantly important in the financial world. Cryptocurrency, among other digital assets, is such a solution since it allows buyers and sellers to conduct transactions directly without the intervention of central authorities, thus, a potentially beneficial asset to the national economies ([Johnson, 2020](#)). Although the formal banks and financial institutions in Pakistan are prohibited from providing crypto-related services by the State Bank of Pakistan (SBP), Pakistan is ranked third, just behind the United States, on the Crypto Adoption Index ([Sadiq et al., 2021](#)). This growing adoption demonstrates that cryptocurrency is gaining popularity as an instrument in the emerging knowledge-based economy in Pakistan, and the necessity of familiarizing oneself with the impact it may have on the dynamics of the financial market.

After being managed primarily by computer specialists for quite some time, cryptocurrencies have become disruptive in global finance within just ten years. Since they are independent of central control, they are highly sought after by investors and financial institutions. Pakistan is one country where this trend continues to rise despite strict laws from the SBP and unclear regulatory systems ([Zafar & Sulaiman, 2020](#)). On one hand, cryptocurrencies promise increased financial access and more investment opportunities, but there are also risks to consider, such as volatility, instability, and regulatory uncertainty ([Foley et al., 2019](#)). The increasing consciousness of the stakeholders highlights the importance of assessing the possible roles of the stakeholders on the Pakistani financial markets.

The correlation between the cryptocurrency and gold markets is found to have acquired a specific significance. Gold has always been regarded as a safe haven and a place to stay when there is economic downfall. However, as cryptocurrencies become more popular, they are also attracting investors as viable investment options. The cryptocurrencies, e.g., Bitcoin, are referred to as digital gold due to their perceived value and resistance as an investment ([Mikhaylov, 2020](#)). Such a transition could change the supply and demand patterns of gold and could affect how investors act, particularly because Pakistan is historically a gold-based nation ([Belke and Beretta, 2020](#)). It is important to study whether cryptocurrencies will serve as an addition to or a replacement for gold as an investment and how this change could impact the Pakistani financial system.

Cryptocurrencies introduce new dynamics in exchange markets. They are not controlled like traditional currencies, which are managed by central banks and influenced by the country's exchange rate policies. In Pakistan, fluctuations in exchange rates and existing regulations influence currency market stability. Cryptocurrencies could serve as an alternative tool for organizing trade. They also enable faster and lower-cost cross-border transactions and remittances, which is especially important in a country where foreign remittance is a significant income source. This aspect is crucial for analyzing the potential impact of introducing cryptocurrencies on liquidity, exchange rate policies, and regulation practices within Pakistan's financial sector ([Baloch & Abro, 2023](#)).

Cryptocurrencies have become recognized as alternative, high-risk, high-reward investment opportunities in stock markets worldwide. The potential for higher returns through cryptocurrencies offers young investors in Pakistan a new opportunity, especially since the traditional stock market mainly involves conventional assets. They attract a new type of investor who is more likely to engage in speculative trading. Even though

cryptocurrencies are not as associated with equity-like volatility, they often trigger increased speculation ([Letho, 2019](#)). This can influence trading activity, liquidity, and price movements in the equities market. The connection between cryptocurrency and stock exchange trends is therefore essential for understanding how investment behaviors could change and how stability in the stock market may be impacted in Pakistan ([Zahoor et al., 2023](#)).

One of the most traditional areas of conservative, risk-free investment has recently become more challenging due to the increasing trend of cryptocurrencies. Bonds, especially government securities, are traditionally valued for their stability ([Andritzky, 2012](#)). In contrast, cryptocurrencies are highly risky and volatile. As they become increasingly popular, they may attract investors, particularly younger or less risk-averse ones, and thus divert attention away not only from bonds but also from their demand, yields, and overall stability in the bond market. This potential shift raises the question of whether cryptocurrencies will complement or compete with Pakistan's bond market, which requires careful analysis ([Zhang & Umair, 2023](#)).

These trends are supported by the overall growth of the digital asset market in Pakistan. The market is expected to reach \$1,728 million by 2024, with a growth rate of 4.86 percent, and is projected to hit \$1,644 million by 2025. The average revenue per user is forecasted to increase to \$64.1 in 2024, with the number of users potentially reaching 27.1 million in 2025. User penetration is estimated to be 11.83% in 2024 but is expected to slightly decrease to 11.67% in 2025 ([Statista, 2024](#)). Government encouragement of blockchain adoption, along with a young, tech-savvy population, further drives growth and the increasing significance of digital assets in the economy.

Cryptocurrencies as intermediary financial services also provide added value because they can serve as tools for increasing financial inclusion among unbanked populations. They have made investments accessible to those traditionally excluded from banking and align with the aspirations of emerging economies. It has been shown that countries adopting digital financial solutions tend to achieve higher levels of economic stability and greater progress in reducing poverty ([Lons et al., 2020](#); [Jejenywa et al., 2024](#)). In Pakistan, cryptocurrencies are empowering marginalized communities and relatively new businesses by offering them a way to participate in the economy. Industries such as intellectual capital and digital financial platforms have the potential to boost economic competitiveness and support sustainable development ([Lin et al., 2021](#)).

Nonetheless, despite these opportunities, Pakistan still has a strict regulatory system that acts as a barrier. In 2018, SBP banned cryptocurrencies, citing concerns about consumer protection, volatility, and money laundering ([Rana et al., 2023](#)). However, there is high demand, mainly because people are aware of the benefits, especially the affordability and speed of remittance transfers ([Uyduran, 2020](#)). In Pakistan's economy, remittances are a vital component; they totaled nearly \$30 billion in 2021. Cryptocurrency could reduce both the amount and the time needed for cross-border transfers, which benefits Pakistan as it seeks to boost financial inclusion and economic growth ([Zahid et al., 2024](#)).

Cryptocurrencies have an economic value beyond just being a form of money. Similar to intellectual capital, their worth is derived from scarcity, decentralization, and the traceability enabled by blockchain technology ([Faraji et al., 2022](#); [Baima et al., 2021](#)). These are knowledge assets that can influence financial markets to be both innovative and sustainable. Cryptocurrencies can bring more transparency, enhance access to financial services, and enhance economic development in Pakistan with appropriate regulation ([Jimoh et al., 2019](#)).

Nevertheless, their introduction in financial markets comes with both possibilities and threats. On the one hand, cryptocurrencies may serve as the means of protection against inflation, accessing populations that are not covered by the banking system, and contributing to the inclusion of the latter. Conversely, they have been highly dynamic, prone to speculative bubbles, and they are hard to control. Similar to the case of Pakistan, to balance these threats and opportunities, the right policies are required, a scenario that has already been witnessed in other nations that have already tested the waters in crypto adoption, including Nigeria and El Salvador.

The problem is that the development of cryptocurrency in Pakistan is a two-fold challenge due to the rapid growth. Even though it brings financial inclusion, innovation, and economic growth, it disrupts the traditional assets such as gold, stocks, and bonds. The absence of sophisticated control exacerbates this tumult, exposing investors to irrational market volatility, money laundering and inadequate protection. The usage is restricted because of the insufficient digital literacy, poor tools, and limitations introduced by SBP. To cope with these problems, it will be necessary to investigate the interactions of cryptocurrencies with the financial markets, open opportunities, and reduce possible risks.

This paper will discuss the effect of the adoption of cryptocurrencies on the Pakistani gold market, the stock market, and its bond market. Particularly, it aims to examine the impact of these digital assets on the trends that shape the prices of gold, the dynamics of stock indices, and the trend of bond investments. The paper is aimed at providing suggestions on how cryptocurrency integration may remodel the financial system in Pakistan and change the impact of investment behaviors by covering these three areas. Furthermore, the significance of the study in terms of policy and strategy can be justified by the fact that it can contribute to these spheres. Investigating the effect of cryptocurrency on the Pakistani financial market would provide the policy-makers and stakeholders with useful information regarding threats and prospects, which would aid in creating relevant regulation frameworks. Adequate regulation will enhance financial accessibility, safeguard investors, and enhance the role of Pakistan in the world digital economy.

2 | Literature Review

Pakistan's manufacturing and service sectors have the great advantage of geo-economic strategic location and infrastructure [Asrar-ul-Haq \(2015\)](#), considerable government policy backing, and potential talent to increase the performance of business firms and lead in global competition ([Shah & Syed, 2018](#)). However, these firms have not only failed to compete in the international markets but also remained unsuccessful in local markets in meeting customers' requirements in terms of product innovation, quality, and cost-effectiveness. There are many reasons for these business firms' failure, however, one of the major reasons for their flop is the effective learning and development of their potential talent to think outside of the box to design and develop innovative and cost-effective products ([Mujtaba & Mubarik, 2022](#)).

To overcome these challenges, many firms in Pakistan are investing millions of rupees in the learning and development of their employees in various formal programs like education, training, seminars, and workshops. Despite spending a huge amount on learning, these firms remain unsuccessful in competing with international firms within and outside the country ([Duffield & Whitty, 2016](#)). Unfortunately, these firms have failed to understand the importance of individual creativity is mainly based on sharing knowledge of potential talent in social interaction in the workplace. Social interaction among employees is a critical and unavoidable

component of any knowledge management system in the age of globalization. Further, individual learning is continuously evolving due to frequent changes in social interaction and market demand; therefore, it may be seen as a continuous and two-way process that every firm needs to adopt to sustain itself in the business market ([Ali et al., 2018](#)).

To comprehend the complexity of an individual's learning, social interactions, and relations at the workplace, there is a need to research to explore each aspect's intricacies and relationships in the context of developing countries ([Ali et al., 2018](#)). New avenues of knowledge need to be discovered in the context of knowledge management and knowledge-sharing practices within different sectors, countries, and regions ([Santhosh & Lawrence, 2023](#)). This research will contribute by exploring the role of social interaction in the learning and development of employees in business settings. Further, determine the relevance of the transfer and exchange of knowledge to develop novel approaches and solve unforeseen problems of an organization to remain competitive in the market. Moreover, provides the patterns of how social interaction activities may be introduced and encouraged at the workplace for individual learning.

2 | LITERATURE REVIEW

2.1 | Cryptocurrency and the Gold Market

Much attention has been given to the comparison of cryptocurrencies and more traditional investments such as gold. It has always been the case that gold is a safe-haven asset when the economy is [volatile](#) ([Baugi & Zhang, 2024](#)). [Vergne \(2020\)](#) claims that Bitcoin may be called digital gold due to its decentralized design and rarity. [Sheikh \(2022\)](#) has further observed that because of the perceived increased returns, Pakistani investors are slowly moving towards introducing cryptocurrencies in place of gold. These results indicate that the traditional asset markets like gold are likely to be a way to learn more about the new power of cryptocurrencies. The most widespread form of cryptocurrencies is called Bitcoin due to its decentralized character and its capacity to fight inflation. This stance places cryptocurrencies as a very appealing asset to those investors who need a safe-haven that is relatively unaffected by inflation, much like gold ([Odegard and Volden, 2020](#)). Diversifying has led to a replacement of gold by cryptocurrencies in Pakistan, where it has always been regarded as a safe investment and a symbol ([Ullah et al., 2024](#)). The new generation, and other tech-savvy individuals are slowly transferring part of their investments out of traditional securities in favor of cryptocurrencies in which they think are superior and more high-tech investments ([Krause, 2025](#); [Economic Times, 2025](#)). This shift has provided more flexibility for investors and has introduced modernization to Pakistan's financial markets. Additionally, the global use of cryptocurrencies mitigates the disadvantages associated with investing in gold, creating more opportunities for people who might face hurdles in investing in gold due to various challenges. As per the structure of cryptocurrencies in Pakistan, it appears that the gold market faces various threats in the form of competition in investment ([Afzal & Asif, 2019](#)). While gold is commonly associated with relative stability compared to traditional markets, it is gradually being replaced by the extremes of digital assets' risk/reward profiles. The sales of such amounts of gold can lead to the destabilization of prices, in particular of the cryptocurrencies, which now have their fair share of speculation. Also, the culture and symbolism of gold as a material in dowries and inheritance are likely to be threatened by innovative digital financial systems among the urban population ([Andrlic et al., 2023](#)). Secondly, with

cryptocurrencies considered largely as an unregulated form of money, the credibility of these deals becomes an issue of serious concern, thus a threat that threatens conventional investors hailing from the noble metal's stable and reinforced feel of tangibility. In light of the debate above, the current study tests the subsequent hypothesis

H1: There is an impact of the adoption of cryptocurrencies on the gold market of Pakistan.

2.2 | Cryptocurrency and the Stock Market

Cryptocurrencies are emerging as a high-risk, high-return alternative to traditional equity markets. [Baloch & Abro \(2023\)](#) observed that younger investors in Pakistan are diversifying their portfolios with cryptocurrencies, attracted by their risky appeal. The authors characterize traditional equities. [Antonakakis et al. \(2019\)](#) stated that due to high volatility, there are daily or even within-day opportunities for impressive profit-making. According to [Baloch et al. \(2023\)](#), the cryptocurrency has implications impact stock market liquidates and price fluctuations in Pakistan. These observations hence indicate that cryptocurrency is revolutionizing investment in stock markets.

Cryptocurrencies extend a different kind of asset category in the existing financial system and also include a new concept beyond equities [\(Bianchi, 2020\)](#). In the case of investment by Pakistanis, especially for the youth, most of whom are tech-savvy and interested in digital sectors, cryptocurrencies can be considered a high-risk/high-reward instrument that acts as a kind of additive to traditional investments. An idea that it will help to attract investment from Pakistan markets and signalize the attraction of foreign investments into the Pakistani market by offering modern, innovative products. Furthermore, what is presented as cryptocurrencies possess a capacity to enhance the transparency of transactions in general with the help of the underlying blockchain platform, which may beneficially impact corporate governance and financial reporting in the future [\(Dashkevich et al., 2024\)](#)

The volatile nature of such coins can lead to much instability in stocks for investments. Crypto assets' high price fluctuations, mainly because of demand and herd sentiments, may obscure other normal stock investments, not to mention Pakistan's still embryonic and illiquid stock exchange market. It means that a transfer of funds from equities to cryptocurrencies may amplify short-term fluctuations of stock indices and disrupt orderly investor behavior [\(Bozzetto, 2023\)](#). Moreover, the lack of rules controlling crypto investments makes traditional stock markets dependent on unpredictable capital withdrawals during bear phases of the crypto market. These pose a major threat to the Pakistan stock market today as it remains highly volatile and requires certainty and stability of the regulating authority [\(Hussain et al., 2022\)](#). In light of the debate above, the current study tests the subsequent hypothesis:

H2: There is an impact of the adoption of cryptocurrencies on the stock market of Pakistan.

2.3 | Cryptocurrency and the Bond Market

Cryptocurrencies are troubling global bond markets, which are considered a relatively safe form of investment. [According to Virta \(2022\)](#), novice investors prefer cryptocurrencies over bonds because bonds offer higher returns. [Aslam et al. \(2020\)](#) indicated that this results in a direct impact on both bond yields and demand

and tenors in the low-risk averse market such as Pakistan. [Belke & Beretta \(2020\)](#) have noted that cryptocurrencies, through their speculative character, put pressure on more traditional assets, risk the stability of conservative portfolios. Such insights suggest that there has been a notable transformation in the bond market's investment culture.

The principle of decentralization and further annulment of the role of borders makes cryptocurrencies a more attractive option for investors willing to gain higher yields compared with bonds ([Harb et al., 2024](#)). Government bonds, which are considered safer instruments in Pakistan, having low yield, have been new market instruments that the younger generation is willing to take higher risk for. Cryptocurrencies enabled diversification may lead to innovations in financial instruments, and new advances in bond trading technology. Moreover, there is a possibility to introduce "crypto bonds" or tokenize the governmental debt using the blockchain, which will make it easier for domestic and foreign investors.

Cryptocurrencies' high volatility and even their very essence is a direct threat to the bond market ([Shahrour et al., 2023](#)). As risk-seeking investors withdraw their funds from bonds to cryptocurrencies, there could be a possibility of a reduction in the bond's liquidity, especially government securities ([International Monetary Fund, 2025](#)). This trend undermines the financial stability of Pakistan, in which government securities have significant importance for public expenditure financing and economic stability ([Khan, 2021](#)). A collapse in bond markets and high volatility of cryptos mean higher borrowing costs that the government may face. Also, the lack of a policy that governs and a mechanism that can track such shifts increases risks to greater extremes and therefore challenges a key feature of bond market investment in Pakistan. In light of the debate above, the current study tests the subsequent hypothesis:

H3: There is an impact of the adoption of cryptocurrencies on the bond market.

The brief literature also reveals that the use of cryptocurrencies can increase the literacy rates among Pakistan's largely unbanked and underbanked populations. Cryptocurrencies are digital currencies that employ decentralized forms of securities provided by blockchain technology ([Nakamoto, 2008](#)). This is particularly suitable for informal consumers in rural areas who are unable to access traditional banking facilities ([Ali, 2024](#)). It is also beneficial in carrying out cross-border transfers, which is quite important to Pakistan since it receives a lot of remittances. Cryptocurrencies help families increase the net amount received by leaving those fees and time lags out of transactions and enhancing disposable income and spending power for the improvement of the economic activity ([Uyduran, 2020](#)). These attributes are relevant to Pakistan to enhance the standards of efficient sales, supplemented by promoting the integration of financial and payment services. Nevertheless, there are several limitations that prevent them from being used in practice throughout most social networks. Its application is restricted by rules and measures, for instance, the recent move by the State Bank of Pakistan to bar cryptocurrency in banking. Inequalities relating to technology – for example, low digital literacy and inadequate access to required technology, including hardware and software. However, measures such as the use of regulatory sandboxes could enable the experimentation of cryptocurrencies for advancing financial enabler innovations while attending to challenges, [Jejenywa et al., 2024](#), regarding them.

3 | METHODOLOGY & DESIGN

3.1. Sample and Data Collection

This quantitative research is secondary in nature, gleaned from reputable websites to maintain the validity of the data collected. Sources such as Yahoo Finance were used mainly for the stock market, investing.com for the bond market, kaggle.com for the gold market, and kaggle.com for the cryptocurrency's adoption and prices trends, and the official reports from the State Bank of Pakistan, especially on the regulatory and economic data. Furthermore, peer-reviewed journals, industrial reports, and white papers assist in supporting theoretical frameworks. The data for this study covers the period from [2018 to 2024](#), including comprehensive key financial indicators from the cryptocurrency market, stock market, gold prices, and bond yields. The dataset includes cryptocurrency prices ([Bitcoin, Ethereum, Ripple, Binance Coin, and Cardano](#)), stock market performance ([via the KSE-100 index](#)), gold prices, and bond yields.

- **Cryptocurrency Data:** The dataset includes the daily closing prices of seven major cryptocurrencies: Bitcoin (BTC-USD), Ethereum (ETH-USD), Ripple (XRP-USD), Binance Coin (BNB-USD), and Cardano ([ADA-USD](#)).
- **Stock Market Data:** The KSE-100 Index reflects the daily price of the Pakistani stock market.
- **Gold Data:** The gold prices represent the daily prices of gold.
- **Bond Market Data:** Bond yields represent the price of Pakistan's 10-year bond yields.

3.2. Variables Description

3.2.1. Independent Variable:

In this study, the independent variable is cryptocurrency adoption, and this can comprise of the total number of buyers and/or sellers of cryptocurrencies, the frequency of the occurrence of such transactions, and other market characteristics of cryptocurrencies in Pakistan. Cryptocurrencies so far represent the patterns of interaction between the new and the existing financial systems.

Cryptocurrency Adoption: Assessed through metrics such as the number of active users, trading volumes, and transaction frequencies within the Pakistani market. This includes:

- 1) Bitcoin (BTC)
- 2) Binance Coin (BNB)
- 3) Ripple (XRP)
- 4) Cardano (ADA)
- 5) Ethereum (ETH)

3.4.2 Dependent Variable

The dependent variables include:

1. Gold Market
2. Stock Market
3. Bond Market

3.4. Data Analysis Tools and Techniques

3.4.1 Descriptive Analysis

Data describing the trends in the financial markets was analysed using descriptive analysis to reveal patterns in the data. The necessary amounts and percentages were calculated to provide an overall picture of cryptocurrency adoption and its impact. To enhance understanding, findings were presented with histograms and bar charts.

3.4.2 Normality Tests:

To ensure the validity of the results obtained from parametric statistical tests, normality tests were conducted to determine whether the data were normally distributed. The validity of the data was affirmed through the use of tests, including the Jarque-Bera test. ([Avram & Marusteri, 2022](#)). These tests supported the subsequent statistical analyses by verifying the suitability of the statistical procedures applied.

3.4.3 Stationarity Analysis:

The stationarity of the variables used was checked using the Phillips-Perron test. This operation is crucial, particularly in situations involving time series data, to achieve effective outcomes.

3.4.4 Correlation

Therefore, the strength and direction of the relationships between cryptocurrency adoption and the gold, stock, and bond markets were identified through correlation analysis. Moreover, Pearson and Spearman correlation coefficients were calculated to gain a closer insight. Such analyses provided an opportunity to measure the extent to which chosen variables have a relationship, which helped to better understand how they reciprocate to each other ([Su et al., 2021](#)).

3.4.5 Regression

This paper employed the regression framework in order to determine the linkage between cryptocurrency adoption and the financial markets. According to [Obeng \(2023\)](#), the type of analysis employed in the current paper involves applying multiple regression analysis, which aims to establish the effects of Cryptocurrency adoption on the gold market performance, stock market index, and bond market. All regression models were developed in a way to ensure that the influence of cryptocurrency adoption rate would be independent of other factors affecting markets. The following are the regression equations:

1. Stock Market (KSE-100 Index):

$$\text{KSE-100} = B_0 + B_1(\text{ADA}) + B_2(\text{BNB}) + B_3(\text{BTC}) + B_4(\text{ETH}) + B_5(\text{XRP}) + u$$

2. Gold Market:

$$\text{Gold Price} = B_0 + B_1(\text{ADA}) + B_2(\text{BNB}) + B_3(\text{BTC}) + B_4(\text{ETH}) + B_5(\text{XRP}) + u$$

3. Bond Market:

$$\text{Bond Price} = B_0 + B_1(\text{ADA}) + B_2(\text{BNB}) + B_3(\text{BTC}) + B_4(\text{ETH}) + B_5(\text{XRP}) + u$$

The dependent variables are KSE_100, Gold, and Bond, and BTC, BNB, XRP, ADA, and ETH are the independent variables of (cryptocurrency prices), and B0 is the constant term (intercept), B1 through B5 are the regression coefficients representing the impact of each cryptocurrency on the respective dependent variable.

4 | RESULTS AND DATA FINDINGS

4.1 Descriptive Statistics of Variables:

Below are the descriptive statistics for the key variables, including mean, standard deviation, minimum, maximum, skewness, kurtosis, and other relevant metrics. These statistics help in understanding the central tendency, spread, and distribution characteristics of the variables over the time period from 2018 to 2024.

Table 1. Descriptive statistics of variables

	ADA	BNB	BTC	ETH	XRP	GOLD	KSE_100	BOND
Mean	0.48	223.45	28060.07	1510.65	0.55	1765.95	42422.51	12.01
Median	0.33	234.34	22185.37	1465.71	0.48	1793.90	44899.60	12.04
Maximum	2.97	750.27	106140.60	4812.09	3.38	2788.50	48726.08	16.83
Minimum	0.02	4.53	3236.76	84.31	0.14	1176.20	27228.80	7.93
Std. Dev.	0.54	211.52	22106.15	1230.79	0.37	359.12	4234.77	2.24
Skewness	1.91	0.53	0.93	0.52	2.84	0.46	-1.39	0.04
Kurtosis	6.65	2.02	3.19	2.12	14.70	3.08	4.05	1.89
Jarque-Bera	2978.03	220.73	375.54	197.29	18021.27	91.37	943.44	131.14
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	2556	2556	2556	2556	2556	2556	2556	2556

In above table 1, the Bitcoin (BTC) shows the highest mean value among the cryptocurrencies, with a maximum value of 106,140.60 and a relatively high standard deviation, indicating significant volatility, Binance Coin (BNB) and Ethereum (ETH) also show considerable variation in their daily prices, with BNB reaching a maximum of 750.27 USD and Ripple (XRP) has the lowest mean value (0.55) and positive skewness of 2.84, indicating that its price distribution is highly skewed to the right. However, it should be noted, skewness values under ± 3 and Kurtosis under ± 7 are considered acceptable (Kline, 2011). The KSE-100 Index (Stock Market) has a mean of 42,422.51 with a maximum value of 48,726.08, reflecting the performance of Pakistan's stock market, and the standard deviation for the KSE-100 is relatively high at 4,234.77, suggesting some volatility in stock market performance over the period. Gold prices have a mean of 1,765.94 USD, with a maximum value of 2,788.50 USD, indicating that gold saw a significant rise during the observed period, and skewness is 0.46, suggesting that the distribution is slightly right-skewed, with more frequent lower values and high price outliers. Bond price data has a mean of 12.01 and shows minimal variation, with a maximum of 16.83 and a standard deviation of 2.239, reflecting the less volatile nature of bond yields compared to cryptocurrencies and stock markets.

Table 2.

Correlation Analysis

	ADA	BNB	BTC	ETH	XRP	GOLD	KSE_100	BOND
ADA	1.00							
BNB	0.63	1.00						
BTC	0.61	0.92	1.00					
ETH	0.76	0.94	0.90	1.00				
XRP	0.65	0.50	0.56	0.58	1.00			
GOLD	0.27	0.79	0.82	0.70	0.24	1.00		
KSE_100	0.53	0.62	0.57	0.67	0.42	0.46	1.00	
BOND	-0.17	0.33	0.23	0.25	-0.15	0.33	0.15	1.00

In the Table 2, It can be observed that the crypto assets ([ADA, BNB, BTC, ETH, XRP](#)) are mostly positively correlated with each other, especially BTC, ETH, and BNB are found to be highly correlated with each other, mainly because they share the common drivers such as macroeconomic factors like interest rates, liquidity etc., investor's sentiments, market integration and technological or network linkages. Since many digital currencies are built on or interact with the blockchain ecosystem, they tend to sync together ([Aslanidis et al., 2019 & Nie, 2022](#)). Additionally, Gold prices also show positive links with cryptocurrencies, especially BTC and BNB, because hedging and diversification, and global risk sentiments of investors often cause positive correlation (Dyhrberg, 2016). However, the Stock Market (KSE100) is moderately correlated with ETH and BTC, which suggests some connection to the crypto market, since the international capital market and investors' sentiments fall into both traditional and digital assets ([Hussain et al., 2024](#)). Lastly, the Bond Prices show weaker correlation with most other assets, meaning bonds move differently, which is common in diversified portfolios ([Nadeem et al., 2024](#)).

In addition, we test the hypotheses proposed in the Introduction. The hypotheses were formulated to examine whether the adoption of cryptocurrencies has a significant impact on the traditional financial markets of Pakistan, specifically the stock market ([KSE-100 Index](#)), gold prices, and bond yields.

Table 3.

Regression analysis - Stock Market

Dependent Variable: KSE100				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	38868.89	121.404	320.161	0.000
ADA	-75.128	207.163	-0.363	0.716
BNB	0.488	1.048	0.465	0.641
BTC	-0.044	0.008	-5.679	0.000
ETH	2.825	0.202	13.987	0.000
XRP	828.968	230.838	3.591	0.000
R-squared	0.458			
Adjusted R-squared	0.457			
F-statistic	431.346			
Prob(F-statistic)	0.000			

Table 3 shows the impact of five major cryptocurrencies ([ADA, BNB, BTC, ETH, and XRP](#)) on the stock market of Pakistan ([KSE-100 index](#)). The results showed that BTC, ETH, and XRP have a significant impact, while ADA and BNB are found to be insignificant even at 1% level of significance. BTC was linked to a drop in stock market performance, while ETH and XRP were connected to a rise. The overall model explains a moderate amount of the changes in the stock market, with an R-squared value of 0.46. Durbin-Watson value is 1.998, suggesting no autocorrelation in the residuals. Lastly, the F-statistic is found to be 431.3476, with a p-value of 0.0000, indicating that the model is statistically significant.

Table 4.*Regression analysis - Gold Market*

Dependent Variable: GOLD				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1470.277	6.372	230.757	0.000
ADA	-196.246	10.872	-18.050	0.000
BNB	0.657	0.055	11.939	0.000
BTC	0.013	0.000	32.113	0.000
ETH	-0.023	0.011	-2.212	0.027
XRP	-163.830	12.115	-13.523	0.000
R-squared	0.792			
Adjusted R-squared	0.792			
F-statistic	1947.780			
Prob(F-statistic)	0.000			

Table 4 shows that all the cryptocurrencies have p-values of 0.0000, indicating that all five cryptocurrencies significantly affect gold prices. BTC and BNB were seen to increase gold prices, while ADA, XRP, and ETH were linked to a decrease. So, it can be concluded that the use of cryptocurrencies does impact the gold market in Pakistan, but in different ways depending on the type of cryptocurrency. R-square is 0.7925, meaning the model explains 79.25% of the variation in gold prices. Durbin-Watson is 1.616, suggesting potential mild autocorrelation in the residuals. However, the F-statistic is 1948.04, with a p-value of 0.0000, indicating that the model is statistically significant.

Table 4.*Regression analysis - Bond Market*

Dependent Variable: BOND				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.830	0.066	178.440	0.000
ADA	-3.028	0.113	-26.769	0.000
BNB	0.006	0.001	11.036	0.000
BTC	0.000	0.000	-11.853	0.000
ETH	0.001	0.000	12.780	0.000
XRP	-0.877	0.126	-6.959	0.000
R-squared	0.422			
Adjusted R-squared	0.421			
F-statistic	372.861			
Prob(F-statistic)	0.000			

Table 4 shows that all the cryptocurrencies have p-values of 0.0000, indicating that the cryptocurrencies significantly affect bond yields. The results show that ADA, BTC, and XRP were linked to lower bond prices, while BNB and ETH were linked to higher prices. The model had a moderate level of accuracy, with an R-squared value of 0.42. This means cryptocurrency adoption does affect the bond market, but the impact depends upon the type of cryptocurrency.” Durbin-Watson is 1.997, suggesting no autocorrelation in the residuals. However, the F-statistic is 373.1762, with a p-value of 0.0000, indicating that the model is statistically significant.

Table 5.
Hypothesis analysis

Hypothesis	Market Affected	Significant Cryptos ($p < 0.05$)	Impact Direction	R-squared	Conclusion
H1	Gold Market	ADA, BNB, BTC, ETH, XRP	BTC, BNB → Positive ADA, ETH, XRP → Negative	0.79	Accepted: Strong impact; mixed positive and negative effects
H2	Stock Market	BTC, ETH, XRP	BTC → Negative ETH, XRP → Positive	0.46	Partially Accepted: Moderate impact; only 3 cryptos are significant
H3	Bond Market	ADA, BNB, BTC, ETH, XRP	ADA, BTC, XRP → Negative BNB, ETH → Positive	0.42	Accepted: Moderate impact; all cryptos significant, but effects vary

5 | CONCLUSION

This paper examines the role of cryptocurrencies in the financial markets of a developing economy, such as Pakistan. It demonstrates that digital currencies, such as BTC and ETH, are transforming the way the market functions, yet conventional systems are slow to embrace them. The study reveals a growing correlation between cryptocurrencies and traditional assets, including stocks, bonds, and gold. Financial systems must evolve and collaborate with the increasing use of cryptocurrency, as it is opening up new possibilities for accessing financial markets in Pakistan. Since the BTC and BNB increase the gold prices, whereas ADA, XRP, and ETH decrease, the study's findings reveal that all top-five cryptocurrencies significantly affect gold prices and are becoming alternative sources of conventional safe-haven assets, such as gold ([Antonakakis et al., 2019](#), and [Baloch and Abro, 2023](#)). Additionally, it is also determined that the adoption of a few cryptocurrencies, such as BTC, ETH, and XRP, greatly affects the Stock market of Pakistan. In contrast, BNB and ETH were associated with higher bond prices, whereas ADA, BTC, and XRP were associated with lower bond prices. Therefore, the impact of all cryptocurrencies on Pakistan's bond market is limited. As a result, it is found that cryptocurrencies have a substantial impact on conventional financial markets, albeit to differing degrees. Additionally, Pakistan is on the verge of a financial market transition. Traditional assets like gold are increasingly being replaced by less reliable digital ones. The findings also suggest that cryptocurrencies can contribute significantly to reshaping the investment culture in Pakistan, particularly in the context of evolving regulatory frameworks. The future of cryptocurrency holds immense promise, and Pakistan must seize this opportunity to reap its benefits.

5.1 Practical Implications

This study helps crypto investors understand how digital currencies impact traditional assets, such as stocks, gold, and bonds. Since cryptocurrencies are volatile, investors should assess risks before investing to protect

their money. Moreover, investors should always diversify their investment portfolio by adding assets from different classes to mitigate the risk associated with them. On the other hand, the government should take a two-pronged approach to encourage a thriving cryptocurrency economy. It should, first and foremost, provide a regulatory framework that allows businesses to develop and test cryptocurrency solutions without fear of legal repercussions. To prevent illicit conduct, protect consumers, and ensure accountability and transparency, this system should have strong rules. By striking a balance between regulation and innovation, the government can employ cryptocurrencies to advance economic development and financial inclusion.

5.2 Limitations

- **Limited Data-set:** The study uses data from 2018-2024, which may not fully capture long-term trends or the most recent developments in cryptocurrency markets.
- **Missing Data:** Some data gaps were present, though efforts were made to interpolate missing values.
- **Assumptions:** The model assumes linear relationships, which may oversimplify the complexities of financial market behavior.
- **Data Collection:** Gathering reliable data for cryptocurrencies and traditional markets in Pakistan posed some challenges.

5.3 Recommendations

1. For Financial Regulators and SBP: Reinforce the regulation of cryptocurrency markets, in particular their effect on conventional markets. Specifically, SBP needs to formulate holistic policies that reduce volatility and systemic risks, with a view to promoting responsible and sustainable innovation.
2. For Investors: Cryptocurrencies should be diversified to even out the risks of carrying on that portfolio, with stocks, bonds, and other classes of assets.
3. For managers, Various policies can be implemented to enhance the financial education regarding understanding the nature of virtual assets, especially cryptocurrencies

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