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Demographic-governance factors shaping cryptocurrency holding behavior

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ABSTRACT

Employing cross-sectional data of 142 countries worldwide, this paper examines the macroeconomic factors in shaping cryptocurrency adoption. We find that the aggregate impact of inflation volatility on crypto adoption is dependent on the level of corruption control in higher-income countries. The control of corruption appears to discourage cryptocurrency adoption, emphasizing the role of institutional trust in financial choices. We also find that higher emigrant ratios in non-high-income and lower-income countries are associated with increased cryptocurrency usage, which suggests that migrants tend to use cryptocurrencies for faster, cheaper remittances compared to traditional services. Last, we find that internet penetration plays a key role in crypto adoption, particularly in higher-income countries with advanced digital infrastructure.

1. Introduction

The unprecedented emergence of cryptocurrencies (e.g., Bitcoin, Ethereum) is reshaping global finance, driving widespread interest and investment in these alternative assets (Carbó-Valverde et al., 2025). Their creation stems from a need for an alternative medium of exchange resistant to institutional censorship and debasement (Auer and Tercero-Lucas, 2022). In response, many central banks are issuing or preparing to issue their own digital currencies (Fujiki, 2021). Since Bitcoin's launch in 2009, digital assets have evolved into a globally recognized asset class, with ownership observed across most countries by 2023 (Fig. 1). While the Financial Stability Board (2022) warns of risks stemming from structural vulnerabilities and integration with the traditional financial system, the unique features and potential benefits of cryptocurrencies support their inclusion in diversified portfolios (Carbó-Valverde et al., 2025).

Several factors influence cryptocurrency adoption. First, individual characteristics such as demographics (Auer and Tercero-Lucas, 2022), risk tolerance (Fujiki, 2020; Hackethal et al., 2021), financial literacy (Carbó-Valverde et al., 2025), and investor perceptions

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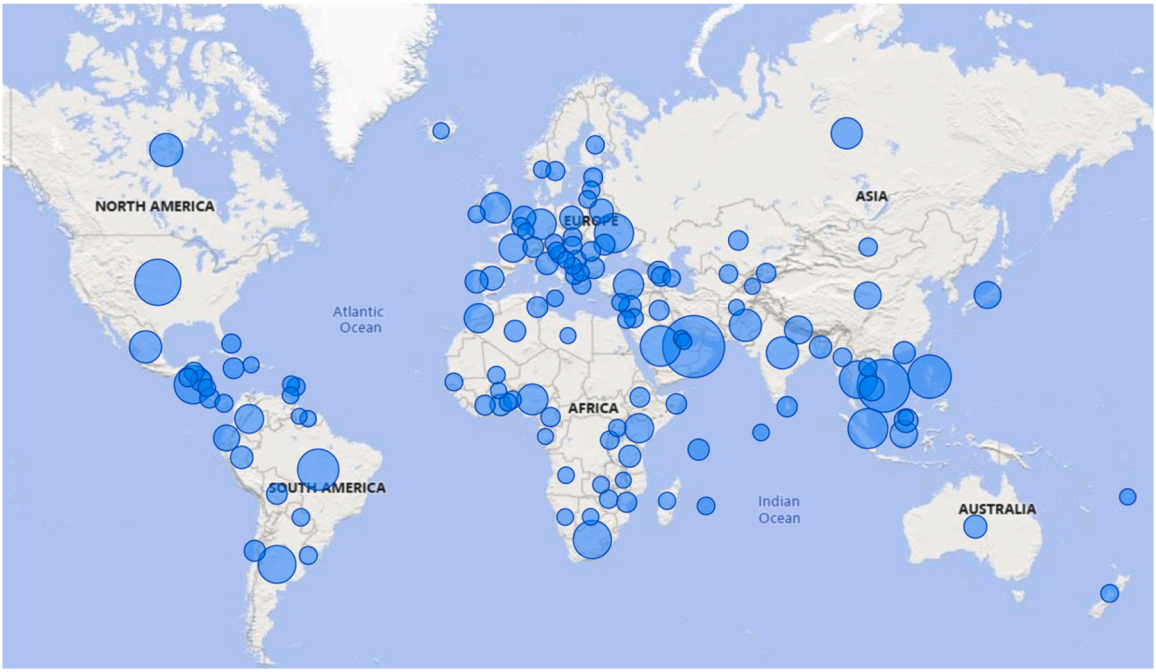

Fig. 1. Cryptocurrency account holders per capita across the globe in 2023
Note: This bubble map illustrates the number of cryptocurrency account holders per capita across countries, with larger blue bubbles indicating higher levels of adoption.

(Arli et al., 2021; Glaser et al., 2014; Steinmetz et al., 2021) are widely documented. Second, market dynamics—particularly price movements—are shown to affect adoption behavior (Auer et al., 2025; Kristoufek, 2013). Third, macroeconomic and institutional factors also play a role, including national development levels (Bhimani et al., 2022), governance quality (Alnasaa et al., 2022; Gonzálvez-Gallego and Pérez-Cárceles, 2021), inflation (Alnasaa et al., 2022; Saiedi et al., 2021), and monetary policy signals (Marmora, 2022).

While prior studies focus on demographics and market trends in cryptocurrency adoption, the influence of macroeconomic fundamentals remains underexplored. This paper fills that gap by examining how inflation volatility, financial instability, remittance needs, and digital accessibility shape cryptocurrency ownership beyond speculative motives. We also explore the interaction between inflation volatility and corruption control—an area yet to be studied. By decomposing the analysis by income groups, our study offers nuanced insights into adoption patterns across different levels of economic development, with implications for policymakers and financial institutions.

This paper is structured as follows. Section 2 presents brief related theoretical frameworks. Section 3 shows the methodology and data. Section 4 presents and discusses our findings. Section 5 concludes our paper.

2. Related theoretical background

There are two key theoretical frameworks explaining cryptocurrency adoption. The first is the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003), which explains individual intentions and behaviors in using information systems. It identifies four main determinants of user acceptance: performance expectancy, effort expectancy, social influence, and facilitating conditions. The second is Institutional Trust Theory (ITT) (Zucker, 1986), which emphasizes the role of individuals' trust in the integrity and reliability of institutions in shaping their willingness to adopt digital platforms. In the context of fintech, institutional trust significantly influences users' engagement with digital services (Jafri et al., 2024; Ofori et al., 2017).

3. Methodology and data

We use the cross-sectional data of 142 countries worldwide in 2023. Data on cryptocurrency ownership (the dependent variable) is obtained from Triple A website.[1] Since this data is only available for the year 2023, we are constrained to use cross-sectional data instead of panel data for our analysis. Meanwhile, data for independent variables are collected from World Bank Development Indicators (WDI) and World Bank Immigration database.

[1] The data is obtained from https://www.triple-a.io/cryptocurrency-ownership-data

We investigate the macroeconomic factors that might affect crypto adoption behavior. The baseline model is in Eq. (1).

$$Crypto\_holding_i = \beta_0 + \beta_1 Inflation\_volatility_i + \beta_2 Corruption\_control_i + \beta_3 Emigrant\_ratio_i + \beta_4 Internet_i + \beta_5 Openness_i + \varepsilon_i \quad (1)$$

where *i* represents country. *Crypto_holding* represents the percentage of people holding cryptocurrency accounts. *Inflation_volatility* is the volatiltiy of inflation.[2] *Corruption_control* represents the control of corruption, which takes the value between (-2.5; 2.5).[3]. *Emigrant_ratio* refers to the number of emigrants of a country to its population ratio, extracted from World Bank immigration database. *Internet* represents the internet user percentage, gathered from WDI. *Openness* is the financial openness, which is equals to export + import, obtained from WDI.

Additionally, we also include the interaction term *Inflation_volatility* Corruption_control* in the model to examine the combined impacts of those two factors to crypto adoption as in Eq. (2).

$$Crypto\_holding_i = \gamma_0 + \gamma_1 Inflation\_volatility_i + \gamma_2 Corruption\_control_i + \gamma_3 Inflation\_volatility_i * Corruption\_control_i + \gamma_4 Emigrant\_ratio_i + \gamma_5 Internet_i + \gamma_6 Openness_i + \varepsilon_i \quad (2)$$

In the Appendix, we present the summary statistics, correlation matrix, and definition of employed variables (Table A1), the variance inflation factors (VIF) showing no severe multicollinearity (Table A2), the analysis results showing no strong evidence of global spatial clustering in cryptocurrency adoption across countries (Table A3), and the Jarque-Bera normality test of regression residuals (Table A4). Appendix Table A5 shows the robustness test using a Two-Stage Least Squares (2SLS) estimation to address potential endogeneity concerns, while Table A6 presents the robustness check using demeaned interaction term.

4. Empirical results

4.1. Why are people holding cryptocurrencies?

We first begin by simply plotting the nexus between crypto adoption and some selected factors (see Fig. 2). It appears that there is a positive relationship between cryptocurrency ownership and inflation volatility, emigrant ratio and internet usage (Fig. 2a, 2c, and 2d). Meanwhile the nexus with control of corruption seems unclear (Fig. 2b).

To empirically validate these relationships, we estimate regression models based on Eq. (1). As shown in Table 1, control of corruption has a significant negative effect on cryptocurrency ownership across the full sample and income groups, indicating that higher corruption levels are associated with greater crypto adoption—consistent with Alnasaa *et al.* (2022) and Bhimani et al. (2022). Unlike prior studies using aggregate analysis, our income-group decomposition reveals that this relationship does not hold in lower-income countries. This may reflect the presence of institutional voids—such as limited financial infrastructure and weak public services—where individuals rely less on institutional quality for financial decisions (Khanna and Palepu, 2010). Accordingly, the Institutional Trust Theory may have limited relevance in contexts with severely underdeveloped institutions.

Internet penetration significantly promotes cryptocurrency adoption in the full sample and higher-income countries, but not in non-high-income or lower-income countries.[4] This contrasts with prior aggregate-level studies (Alnasaa et al., 2022; Saiedi et al., 2021), suggesting overlooked heterogeneity across income groups. While digital infrastructure is often deemed more critical where formal finance is weak, the finding appears inconsistent with UTAUT and common expectations. A possible explanation lies in Van Dijk (2006)'s digital divide theory, which emphasizes that effective ICT[5] use also requires motivational, skills, and usage access—dimensions often lacking in poorer countries—thereby limiting the impact of internet access on crypto adoption.

In contrast to Alnasaa et al. (2022), who find no significant effect of remittances on crypto usage, our results show that *Emigrant_ratio* positively influences crypto adoption in lower-income and non-high-income countries. This highlights the growing use of cryptocurrencies for remittances in these economies, driven by lower transaction costs (Campioni-Noack, 2021). Moreover, in contexts of institutional voids—where formal financial and remittance systems are weak (Khanna and Palepu, 2010)—crypto-assets offer an alternative means of fund transfer outside conventional channels.

Lastly, the effect of inflation volatility on crypto adoption varies by income group: it is positive in higher-income countries but negative in lower-income ones. This contrasts with Saiedi et al. (2021), who report a uniformly positive effect in their aggregate analysis.

Table 2 reports the results from Eq. (2), which includes an interaction term to examine whether the impact of inflation volatility on crypto adoption varies with levels of corruption control—an aspect not captured in Eq. (1). To our knowledge, this is the first study to investigate this joint effect.

[2] Estimated by taking standard deviation of the inflation in the last 30 years. Different time intervals have been used as well.

[3] Control of corruption, extracted from WDI, refers the "*Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption.* (Gonzálvez-Gallego and Pérez-Cárceles, 2021) Higher value implies better control of corruption.

[4] Based on the World Bank country classification (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups#:~:text=For%20the%20current%202026%20fiscal,IBRD), we decompose our sample into three income groups: (i) Higher-income countries: High income and Upper middle income. (ii) Non-high-income countries: Upper middle income, Lower middle income, and Low income. (iii) Lower-income countries: Lower middle income and Low income.

[5] Information and Communication Technology

Fig. 2. The nexus between cryptocurrency account holders per capita and economic factors in 2023
Note: Scatter plots illustrating the bivariate relationship between *Crypto_holding* (account holders per capita) and *Inflation_volatility* (Fig. 2a), *Corruption_control* (Fig. 2b), *Emigrant_ratio* (Fig. 2c) and *Internet* (Fig. 2d). Definition of variables are presented in the note under Appendix Table A1.

We find that the effect of *Inflation_volatility* on crypto adoption depends on the level of *Corruption_control*. In higher-income countries, *Inflation_volatility* has a positive and significant coefficient (0.0004), while its interaction with *Corruption_control* is negative and significant (–0.0004), implying that the total effect decreases as corruption control improves. This supports Institutional Trust Theory (Zucker, 1986), which suggests that in well-governed settings, improved institutional trust reduces reliance on crypto as a hedge against inflation. In non-high-income countries, the interaction term is positive, indicating that better corruption control increases the impact of *Inflation_volatility*. This aligns with Peng (2003)'s institutional transition framework, where individuals turn to non-traditional financial tools—such as crypto—amid ongoing but incomplete institutional reforms. In lower-income countries, the total effect of *Inflation_volatility* again declines with stronger corruption control. This can be attributed to institutional voids (Khanna and Palepu, 2010), which constrain the use of crypto despite governance improvements. Moreover, limited digital skills and usage access—as emphasized by the digital divide theory (Van Dijk, 2006)—further hinder crypto adoption. Finally, Table 2 reaffirms the significant positive effects of *Emigrant_ratio* and *Internet* on cryptocurrency ownership.

4.2. Robustness tests

To test robustness, we replace *Corruption_control* in Eq. (1) with alternative governance indicators: *CC_2022* (control of corruption of 2022) and *RL_2022* (rule of law[6] of 2022). Table 3 confirms the positive effect of inflation volatility and the negative effects of

[6] Rule of law is "*Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence* (Gonzálvez-Gallego and Pérez-Cárceles, 2021).

Table 1
The determinants of cryptocurrency adoption.

	Full sample (1)	Higher-income countries (2)	Non-high-income countries (3)	Lower-income countries (4)
Inflation_volatility	0.0002	0.0006***	0.0001	-0.0002*
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Corruption_control	-0.0065**	-0.0063*	-0.0091*	-0.0010
	(0.0028)	(0.0037)	(0.0050)	(0.0088)
Emigrant_ratio	0.1024	-0.0532	0.2713*	0.7935***
	(0.1382)	(0.1047)	(0.1571)	(0.1734)
Internet	0.0005***	0.0006***	0.0003	-0.0002
	(0.0001)	(0.0001)	(0.0003)	(0.0002)
Openness	-0.00003	-0.00004	-0.00004	0.0001
	(0.0001)	(0.0001)	(0.0002)	(0.0001)
N	126	89	77	37
Adjusted R^2	0.0203	0.0386	0.1400	0.5992

Notes: Huber-White heteroskedasticity consistent standard errors are in parentheses. ***, ** and * represent the significance level of 1%, 5% and 10%, respectively. The estimations are based on Eq. (1).

Table 2
The determinants of cryptocurrency adoption (interaction term analysis).

	Full sample (1)	Higher-income countries (2)	Non-high-income countries (3)	Lower-income countries (4)
Inflation_volatility	0.0005**	0.0004**	0.0007***	-0.0013*
	(0.0002)	(0.0001)	(0.0002)	(0.0007)
Corruption_control	-0.0070**	-0.0055	-0.0115**	0.0006
	(0.0028)	(0.0037)	(0.0048)	(0.0091)
Inflation_volatility * *Corruption_control*	0.0003	-0.0004**	0.0006**	-0.0010*
	(0.0002)	(0.0002)	(0.0002)	(0.0005)
Emigrant_ratio	0.1038	-0.0559	0.2827*	0.7975***
	(0.1382)	(0.1051)	(0.1572)	(0.1655)
Internet	0.0005***	0.0006***	0.0002	-0.0001
	(0.0001)	(0.0001)	(0.0003)	(0.0002)
Openness	-0.00002	-0.00004	-0.00001	0.0001
	(0.0001)	(0.0001)	(0.0002)	(0.0001)
N	126	89	77	37
Adjusted R^2	0.0169	0.0309	0.1557	0.6007

Notes: Huber-White heteroskedasticity consistent standard errors are in parentheses. ***, ** and * represent the significance level of 1%, 5% and 10%, respectively. The estimations are based on Eq. (2).

governance quality on crypto adoption in higher-income countries. The significant roles of *Emigrant_ratio* and *Internet* remain consistent with earlier results in Tables 1 and 2.

We further incorporate *CC_2022* and *RL_2022* into Eq. (2), with results reported in Table 4. The findings remain consistent with Table 2, notably confirming that in higher-income countries, the total effect of inflation volatility continues to depend on the level of corruption control (see column 3).

5. Concluding remarks

This study investigates the macroeconomic determinants of cryptocurrency adoption using cross-sectional data from 142 countries in 2023. We extend recent research on crypto use (Alnasaa et al., 2022; Auer et al., 2025; Bhimani et al., 2022; Carbó-Valverde et al., 2025) by providing global evidence and highlighting a novel interaction between inflation volatility and institutional trust. In higher-income countries, the effect of inflation volatility on crypto adoption depends on the level of corruption control. Internet accessibility also plays a significant role, particularly where digital infrastructure is well developed. In lower-income countries, higher emigrant ratios are strongly associated with crypto adoption, reflecting the growing use of cryptocurrencies for remittances. Finally, the negative relationship between corruption control and crypto usage underscores the importance of institutional trust in shaping

Table 3
Robustness test: The determinants of cryptocurrency adoption.

	Full sample		Higher-income countries		Non-high-income countries		Lower-income countries	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation_volatility	0.0001	0.0001	0.0006***	0.0005***	0.0001	0.0001	-0.0001	-0.0001
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
CC_2022	-0.0064**		-0.0068*		-0.0094*		0.0056	
	(0.0027)		(0.0035)		(0.0054)		(0.0080)	
RL_2022		-0.0074**		-0.0093**		-0.0073		0.0105
		(0.0030)		(0.0039)		(0.0056)		(0.0078)
Emigrant_ratio	0.1064	0.0998	-0.0523	-0.0682	0.2689*	0.2684*	0.7799***	0.7631***
	(0.1371)	(0.1409)	(0.0978)	(0.1020)	(0.1581)	(0.1573)	(0.1579)	(0.1488)
Internet	0.0005***	0.0005***	0.0006***	0.0006***	0.0003	0.0003	-0.0002	-0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Openness	-0.00003	-0.00003	-0.00003	-0.00003	-0.00004	-0.00003	0.0001	0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
N	126	126	89	89	77	77	37	37
Adjusted R^2	0.0197	0.0221	0.0413	0.0506	0.1442	0.1362	0.6058	0.6213

Notes: Huber-White heteroskedasticity consistent standard errors are in parentheses. ***, ** and * represent the significance level of 1%, 5% and 10%, respectively. The estimations are based on Eq. (1).

Table 4
Robustness test: The determinants of cryptocurrency adoption (interaction term analysis).

	Full sample		Higher-income countries		Non-high-income countries		Lower-income countries	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation_volatility	0.0003	0.0001	0.0004***	0.0004***	0.0005	0.0002	-0.0006	-0.0007
	(0.0004)	(0.0004)	(0.0001)	(0.0001)	(0.0004)	(0.0004)	(0.0011)	(0.0010)
CC_2022	-0.0066**		-0.0061*		-0.0111**		0.0064	
	(0.0028)		(0.0036)		(0.0053)		(0.0089)	
Inflation_volatility CC_2022*	0.0001		-0.0002**		0.0004		-0.0004	
	(0.0004)		(0.0001)		(0.0004)		(0.0009)	
RL_2022		-0.0072**		-0.0088**		-0.0078		0.0114
		(0.0030)		(0.0041)		(0.0057)		(0.0085)
Inflation_volatility RL_2022*		-0.0001		-0.0001		0.0001		-0.0005
		(0.0003)		(0.0001)		(0.0003)		(0.0008)
Emigrant_ratio	0.1073	0.0996	-0.0542	-0.0684	0.2796*	0.2705*	0.7741***	0.7585***
	(0.1372)	(0.1410)	(0.0980)	(0.1020)	(0.1598)	(0.1581)	(0.1543)	(0.1455)
Internet	0.0005***	0.0005***	0.0006***	0.0006***	0.0002	0.0003	-0.0002	-0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Openness	-0.00003	-0.00003	-0.00004	-0.00003	-0.00003	-0.00003	0.0002	0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
N	126	126	89	89	77	77	37	37
Adjusted R^2	0.0123	0.0143	0.0329	0.0404	0.1440	0.1247	0.5943	0.6113

Notes: Huber-White heteroskedasticity consistent standard errors are in parentheses. ***, ** and * represent the significance level of 1%, 5% and 10%, respectively. The estimations are based on Eq. (2).

financial behavior.

Our results imply that in higher-income countries, maintaining price stability remains important for curbing crypto demand. In lower-income countries, improving digital access and reducing remittance costs may reduce reliance on crypto. Limited to 2023 cross-sectional data, this study calls for future research using panel data and exploring how different uncertainties—such as market, geopolitical, or policy-related—shape crypto adoption over time.

CRediT authorship contribution statement

Tam Hoang Nhat Dang: Writing – review & editing, Writing – original draft, Visualization, Formal analysis. **Faruk Balli:** Writing – review & editing, Writing – original draft, Supervision, Data curation. **Hatice Ozer Balli:** Writing – review & editing, Investigation, Formal analysis. **Ilhan Kilic:** Writing – review & editing.

Conflict of interest statement

There is no conflict of interest between co-authors.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.frl.2025.108143.

Data availability

Data will be made available on request.

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