

# Cryptocurrency-Tax Evasion Nexus: Do Institutions Matter? The Case of G7 Countries

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**Abstract:** *Cryptocurrencies have faced significant criticism due to their association with tax evasion, money laundering, and criminal activities, such as fraudulent investments, drug trafficking, and terrorism financing. Cryptocurrencies' decentralised and regulatory bypassing nature raises concerns among regulators, who aim to ensure the integrity of centralised financial systems and institutions. Despite these concerns, cryptocurrencies offer secure, efficient, and low-cost payment methods on a global scale. In light of these contrasting dynamics, this study investigates the role of cryptocurrencies in tax evasion within the Group of Seven (G7) countries. The study provides the latest assessment of tax evasion levels by constructing a novel tax evasion index using the currency demand approach (CDA). Employing panel techniques and utilising data from 2013 to 2020, the research reveals a negative relationship between cryptocurrencies and tax evasion. Additionally, the study highlights the significance of institutional quality in shaping the association between cryptocurrencies and tax evasion. The findings of this study offer valuable insights to policymakers, informing them of the relationship between Bitcoin, governance, and tax evasion. By comprehending the dynamics at play, policymakers can make informed decisions regarding the regulation and oversight of cryptocurrencies, ensuring a balanced approach that addresses concerns while leveraging the benefits offered by these digital assets.*

**Keywords:** Tax evasion; Cryptocurrencies; Bitcoin; G7; Panel model; Institutions  
**JEL Classification:** E26, G28, H26, K34

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## 1. Introduction

Tax evasion is a serious concern for governments, as it directly reduces tax revenue allocated for public welfare and expenditure. Countries across the globe are experiencing an annual loss of USD427 billion due to tax avoidance and evasion (Whalen, 2020). Tax evasion causes developing countries to lose around USD100 billion in annual revenue (Ahamed, 2016). In 2011, tax evasion amounted to 5.1% of the world's GDP, or USD3.1 trillion (Habibullah et al., 2017). Tax evasion is a persistent phenomenon (Slemrod, 2007), and has always been challenging for governments due to the innovative methods adopted by tax evaders (Alleyne & Harris, 2017). These innovative techniques pose a considerable challenge for regulators attempting to control such illicit activities.

The impact of tax evasion is far-reaching and multifaceted. It escalates the cost of law enforcement and tax audits and leads to economic inefficiency, besides distorting competition within markets and exerting adverse effects on a country's development prospects and productivity (Dabla-Norris et al., 2019; Gillman, 2020). Tax evasion is a pervasive issue that exists in nearly every country worldwide, albeit with varying degrees of magnitude. Numerous researchers have endeavoured to measure the extent of tax evasion, employing multiple estimation techniques to assess its prevalence and impact (Schneider, 2004). The findings on tax evasion at the individual level is supported by the literature (Albarea et al., 2019; Alstadsaeter et al., 2017; Austin et al., 2020; Besley et al., 2023; Clotfelter, 1983; Davis et al., 2020; Miller, 2019; Payne & Saunoris, 2020; Richardson, 2006). There are multiple determinants of individual tax evasion, as noted by Alstadsaeter et al. (2017), who conclude that individuals evade taxes due to the high tax rate, and that tax evasion is highest among the rich.

Given the extensive body of literature supporting the detrimental impact of tax evasion on social and economic development, there is a need to measure tax evasion and understand its underlying determinants. In addition to the well-established macroeconomic determinants, recent research also highlights the role of cryptocurrency in facilitating tax evasion. Several studies have identified Bitcoin as a potential vehicle for tax evasion on a global scale (Blundell-Wignall, 2010; Cui et al., 2024; David, 2019; Gruber, 2013; Grym et al., 2024; Marian, 2013; Meling et al., 2024; Zouhair & Kasraie, 2019). David (2019) states that anonymity and presentation

of buyers and sellers as numbers in cyberspace make it difficult for tax collecting agencies to collect capital gain or value-added tax from Bitcoin or crypto users. Gruber (2013) also describes cryptocurrencies as a potential tax haven threat due to less trustworthy exchanges of Bitcoin in the context of the United States.

There is extensive criticism over cryptocurrencies being used as tax evasion tools (David, 2019; Gruber, 2013; Marian, 2013; Zouhair & Kasraie, 2019). Cryptocurrencies facilitate tax evasion due to their pseudonymity, decentralisation, and global accessibility, which reduces the risk of detection and penalties (Ajzen, 1991; Yitzhaki, 1974). Regulatory arbitrage allows users to exploit gaps in international tax laws (Medina, 2018). Anonymity-driven behaviours further incentivise non-compliance (Trozze et al., 2022). These factors underscore the need for enhanced global cryptocurrency regulations. The role of cryptocurrencies as a tool of tax evasion at the individual level has been discussed previously (David, 2019; Gruber, 2013; Marian, 2013; Zouhair & Kasraie, 2019), but there is a lack of empirical analysis in the literature.

Cryptocurrencies have emerged as a standard for the development of innovative solutions. They not only reduce bureaucracy but also increase security and play an important role in promoting global inclusion within an emerging cryptocurrency system (Olmos, 2019). These are the future of a secure payment system, and central banks will fail if they do not follow these currencies (Olmos, 2019). Cryptocurrencies have gained considerable attention from policymakers, investors, and common citizens worldwide in the last decade (Li & Wang, 2017). This attention is multifaceted—Bitcoin is used in USD72 billion worth of illegal activity annually, (Foley et al., 2019), is highly volatile, and approximately 10 million people hold bitcoin as a financial asset (Baek & Elbeck, 2014; Baur & Dimpfl, 2017; Dwyer, 2015; Hileman & Rauchs, 2017). Bitcoin also gives very high returns, and is used in e-commerce as a quick and smooth payment mode with zero transaction costs (Sovbetov, 2018). There are 100,000 companies accepting payments in Bitcoin (Easley et al., 2019). Sovbetov (2018) defines cryptocurrency as “a digital asset designed to work as a medium of exchange using cryptography to secure the transactions and to control the creation of additional units of the currency.”

The significant investments and the unrestricted trading on digital exchanges, coupled with the absence of financial regulatory oversight

and the decentralised nature of operations, have raised concerns among financial institutions and economies. As a result, cryptocurrencies have quickly become subject to criticism due to their potential role in tax evasion, money laundering, terrorist financing, and their utilisation as a payment method for criminal activities (Houben & Snyers, 2018; Marian, 2013). As such, the present study aims to investigate the involvement of cryptocurrencies in tax evasion. When investors engage in cryptocurrency investments or use cryptocurrencies as a form of payment, these transactions occur anonymously. As a result, the decentralised nature of cryptocurrency transactions circumvents regulatory oversight. Consequently, these transactions are not disclosed in business financial statements or reflected in individuals' bank accounts. Several studies have highlighted the presence of anonymity in cryptocurrency transactions (Chohan, 2017a, 2017b; Jafari et al., 2018; Paquet-Clouston et al., 2019).

Given the aforementioned concerns, tax authorities are increasingly considering the possibility of declaring cryptocurrencies illegal due to the potential threats they pose to tax revenue collection, which is a crucial source of funds for funding public expenditure. The low transaction costs of utilising cryptocurrencies in e-commerce have made them appealing to individual consumers, businesses, and investors (Song, 2016). On one hand, they offer a secure mode of payment and are seen as the future of advanced payment systems. On the other hand, cryptocurrencies pose a potential threat to tax revenue. Globally, there is no consensus on their future and current status, despite their significant market capitalisation of over USD1.03 trillion (CoinMarketCap, 2021).

This study contributes to the literature in several ways. Firstly, it measures the impact of cryptocurrencies on tax evasion in the case of Group of Seven (G7) countries. Secondly, it explores the role of institutions in the association between cryptocurrencies and tax evasion. Thirdly, it constructs a new tax evasion index for G7 countries. G7 countries account for 58% of the world's wealth, and are among the fastest growing economies in terms of GDP (IMF, 2017). Cryptocurrencies are spread worldwide, but especially so in developed countries, which is why G7 countries are selected for this study. These countries also have strong tax collection systems; if cryptocurrencies are bypassing these systems, then it may bypass other developing systems of tax collection, audit, and tax reporting. Lastly, at different levels of macroeconomic factors, one macroeconomic factor may impact on another,

which is called interaction term. This study also uniquely introduces the impacts of governance and economic condition on the association of tax evasion and cryptocurrencies.

## **2. Literature Review and Hypothesis Development**

There are two main reasons to review the literature: the first is to refine the research topic, and the second is to know the updated development in this field so future research may proceed from that point (Saunders et al., 2012; Sharp et al., 2017). Tax evasion is one of the main threats to any government's smooth flow of funds. It reduces tax revenue, which is the main source of funds (Picur & Riahi-Belkaoui, 2006). Hichem Khelif (2015), in a review of the literature on tax evasion, concludes that demographic, cultural, behavioural, legal, institutional, and economic factors are determinants of tax evasion. Hichem Khelif (2015) also states that due to a lack of data related to tax evasion, it is harder to measure the impact by researchers. As Tsakumis et al. (2007) state, "actual evasion is unknown and impossible to determine; thus, studies on tax evasion (tax compliance) use surrogate measures for actual evasion." Since tax evasion is associated with the shadow economy, it is harder for researchers to measure tax evasion accurately. Tsakumis et al. (2007) mostly use international tax compliance reports (e.g., Schwab, 2002). These reports measure tax compliance on a scale of 0 to 6, i.e., from a low to high degree of compliance (Riahi-Belkaoui, 2004; Richardson, 2006, 2008). However, there is serious criticism about the willingness of taxpayers to answer the questions truthfully, which calls the quality of the data into question.

Bitcoin was created to send money among peers without the involvement of the country's financial systems. It is a more secure mode of payment using cryptography even for small transactions, and avoids double-spending and irreversible transactions to protect sellers. In contrast, financial institutions perform a reversible transaction with a cost involved, and work on trust. The complete method for such a mechanism was provided by Satoshi Nakamoto (2008). The first open-source Bitcoin client was released, and Nakamoto mined that coin with a reward of USD50. Hal Finney received 10 Bitcoins from Nakamoto. Nakamoto kept mining Bitcoins for up to USD1 million (Chohan, 2017b). Financial regulatory bodies observed the popularity of Bitcoin, creating delays in clearinghouses (Chohan, 2017b).

The trend of using Bitcoin expanded enormously, and businesses, like Foodler and OkCupid, started to accept payments using the cryptocurrency. In 2013, a Bitcoin automated teller machine was also launched in Canada by Robocoin and Bitcoiniaacs.

Cryptocurrencies do not only negatively impact the economy; the literature also supports the positive impact of cryptocurrencies on economic growth by reducing transaction costs, improving stock exchange performance, acting as a haven, reducing exchange rate volatilities, and digitalisation in the economy, which boosts financial openness (Naboulsi & Neubert, 2018; Narayan et al., 2019; Paule-Vianez et al., 2020; Sami & Abdallah, 2020a, 2020b; Sayed & Abbas, 2018; Yin et al., 2021; Zhang & Wang, 2021). Naboulsi and Neubert (2018) measure the impact of digital currencies on Kenya's economy, specifically the impact of Bitcoin on international funds transfer and remittances fees compared to other payment channels. Koutmos (2018) explores the impact of cryptocurrencies in the context of emerging economies and focused on Gulf countries. Zhang and Wang (2021) measure the performance of Bitcoin during a period of financial stress in the US and China, and find that Bitcoin is impacted more by such crises compared to the gold market. Sami and Abdallah (2020a) measure the impact of cryptocurrencies on Gulf stock exchanges. The authors find that a 10% increase in cryptocurrency returns results in a 0.17% decline in stock market returns. Holtmeier and Sandner (2019), meanwhile, studied the possibility of cryptocurrencies in developing economies to reduce developmental barriers, and find that it enhances the financial inclusion of individuals and companies and may impact the economy. Yin et al. (2021) conclude that cryptocurrencies can perform the role of a safe haven during adverse oil market shocks. This is also confirmed by Paule-Vianez et al. (2020) in relation to the Middle East and North Africa (MENA) region. The authors find that during high economic policy uncertainty periods, Bitcoin can be used as a safe haven to protect savings.

On the other hand, several studies find that Bitcoin is used as a source of tax evasion worldwide (e.g., Blundell-Wignall, 2010; David, 2019; Gruber, 2013; Marian, 2013; Zouhair & Kasraie, 2019). David (2019) states that anonymity and presentations of buyers and sellers in the shape of numbers in cyberspace make it difficult for tax collecting agencies to collect capital gain or value-added tax from Bitcoin or cryptocurrency users. Gruber (2013) also describes cryptocurrencies as a potential tax haven threat due

to less trustworthy exchanges of Bitcoin in the context of the US. Blundell-Wignall (2010) states that Bitcoin is a source of tax evasion. The theoretical literature supports cryptocurrencies as a source of tax evasion and a potential threat to tax revenue (Song, 2016). Based on the literature review and the conflicting views on the role of cryptocurrencies, this study tests the following hypothesis:

- H<sub>1</sub> There is an association between cryptocurrencies and tax evasion
- H<sub>2</sub> There is an association between institutional governance and tax evasion
- H<sub>3</sub> Institutional governance moderates the association between cryptocurrencies and tax evasion

### 3. Methodology

This study utilises two distinct time periods for analysis. The development of the tax evasion index covers the years 2001 to 2020. The availability of World Governance Indicators from the World Bank restricts the starting year for analysis to 2001. Annual data is used for estimating the tax evasion index, as the macroeconomic variables employed in the estimation are available at an annual frequency. In addition, the second period of analysis for this study spans from 2013 to 2020. This period is chosen as Bitcoin's market capitalisation data is available from 2013 onwards, allowing for a comprehensive examination of its impact. The variables under investigation are taken from multiple reliable sources. Below is the detailed information regarding the variables and their respective data sources:

**Table 1:** Data and variables employed in this study

Variable	Description	Symbol	Source
Tax evasion	Annual Tax Evasion Index	Tax evasion	Author's calculation using CDA
Money supply	Natural logarithm of real monetary aggregate	M1	World Bank
Currency in circulation	Natural logarithm of real currency holdings measured as nominal currency in circulation normalised by a GDP deflator	C	World Bank
Tax to GDP	Tax to GDP ratio	Tax	World Bank
Real GDP	Natural logarithm of real GDP	Yt	World Bank

Variable	Description	Symbol	Source
Deposit interest rate	The interest rate paid to deposit account holders	R	World Bank
Inflation rate	Natural logarithm of the inflation rate	$\pi$	World Bank
Bitcoin market capitalisation	Market capitalisation	bitC	CoinMarketCap
Enforcement strength	Enforcement strength of public administration	ENF	World Bank
Income	Per capita income	Income	World Bank
Governance indicators	Government effectiveness, control of corruption, political stability and absence of violence/terrorism, regulatory quality, rule of law, voice and accountability	GE, CoC, PS, RQ, RoL, VoA	WGI

### 3.1 Construction of tax evasion index

This study adopts Tanzi's (1980) approach to estimate tax evasion in G7 countries. The currency demand approach is extensively used in literature (Amoh & Adafula, 2019; Athanasios et al., 2020; Dell'Anno & Davidescu, 2019). The following equation of currency demand approach (CDA) is employed for estimation of tax evasion using:

$$C = f(Y^d, R, \pi, Tax, Urbanisation, ENF) \quad (1)$$

Since disposable income is defined as net of direct taxes, so equation (1) can be rewritten as:

$$C = f(Y - Tax, R, \pi, Tax, Urbanisation, ENF) \quad (2)$$

where  $C$  is the currency demand for the whole economy (including official and unofficial demand),  $R$  is the interest rate, and  $\pi$  inflation rate. As the disposable income rises then the demand for currency also rises. As the opportunity cost of holding money ( $R$  and  $\pi$ ) increases, then the demand for currency reduces. Enforcement results in lower currency demand and urbanisation results in higher currency demand. The main assumption in this approach is that the underground economy is more cash-intensive, so as the tax rate increases then the demand for currency increases. The same

assumption is confirmed in literature (Amoh & Adafula, 2019; Athanasios et al., 2020; Cagan, 1958; Dell'Anno & Davidescu, 2019; Tanzi, 1980).

### 3.2 Panel technique

This study employs panel ordinary least squares (OLS) (random effects) regression to test the hypothesis of an association between tax evasion and cryptocurrencies. It incorporates the benefits of timer series models and cross-sectional models. In the panel regression, the entity effects may be random or fixed, so the Hausman test (Hausman, 1978) is conducted to decide the preferred model. Based on the suggestion of the Hausman test, a random effect model is used. The literature widely supports the set of control variables and panel OLS in exploring the association of tax evasion with other macroeconomic variables (Bittencourt et al., 2014; Buehn & Schneider, 2011; Cebula & Feige, 2012; Oz Yalama & Gumus, 2013; Richardson, 2006; Yamen et al., 2020). The primary research model of this study is as follows:

$$TaxEvasion_{i,t} = \alpha_0 + \beta_1 bitC_{i,t} + \sum_{i=1}^n \gamma_i Control_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$TaxEvasion_{i,t} = \alpha_0 + \beta_1 Govn * bitC_{i,t} + \sum_{i=1}^n \gamma_i Control_{i,t} + \varepsilon_{i,t} \quad (4)$$

where *TaxEvasion* is annual tax evasion in G7 countries and *bitC* is the annual market capitalisation of Bitcoin. Tax evasion refers to annual tax evasion in G7 countries, calculated using CDA. More than 2,200 cryptocurrencies are circulating in this digital system (CoinMarketCap, 2021), and it is harder to use the market capitalisation of all these currencies due to the addition or deletion in the crypto market. So, the market capitalisation of Bitcoin, which is 95% of all cryptocurrencies' market capital, is used as a proxy to measure cryptocurrencies.

## 4. Results and Discussion

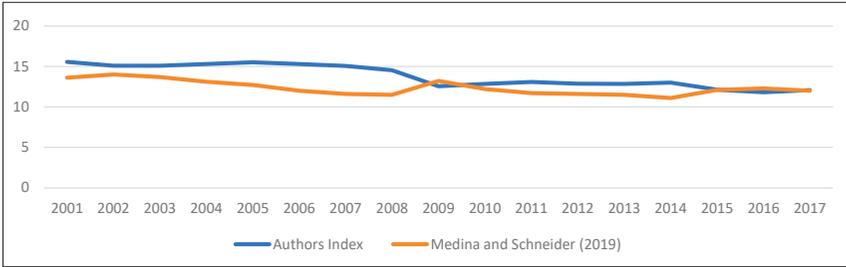
This section presents the results of all methods adopted in this study. First, the time series of estimated tax evasion index is presented in Table 2.

**Table 2:** Historical estimates of tax evasion of G7 countries using CDA as percentage of GDP

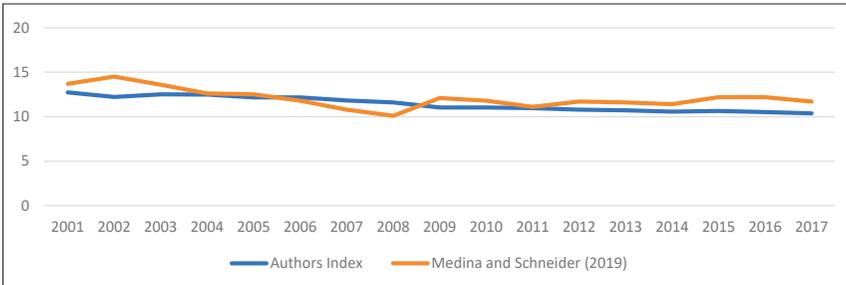
Year	Canada	France	Germany	Italy	Japan	US	UK
2001	15.56	12.73	13.27	10.35	9.89	12.73	12.13
2002	15.10	12.22	13.36	10.23	9.35	12.38	11.73
2003	15.09	12.51	12.73	10.18	9.85	12.03	11.49
2004	15.31	12.49	12.85	9.88	9.95	12.29	11.24
2005	15.51	12.17	12.69	9.59	9.94	12.05	11.05
2006	15.29	12.17	13.01	9.43	10.14	11.99	11.12
2007	15.06	11.83	13.11	9.17	9.94	11.80	11.11
2008	14.54	11.60	12.50	9.10	9.83	11.24	10.77
2009	12.55	11.04	11.78	8.91	9.47	10.63	10.09
2010	12.85	11.03	12.09	8.96	9.59	10.70	10.33
2011	13.08	10.97	12.17	8.86	9.45	10.57	10.37
2012	12.87	10.78	11.91	8.76	9.42	10.67	10.32
2013	12.84	10.71	11.87	8.76	9.42	10.69	10.39
2014	12.99	10.57	12.27	8.61	9.52	10.75	10.57
2015	12.13	10.63	12.15	8.70	9.64	10.81	10.69
2016	11.82	10.52	12.15	8.76	9.74	10.79	10.58
2017	12.08	10.37	12.20	8.77	9.64	10.95	10.61
2018	11.74	10.46	12.12	8.75	9.56	11.01	10.57
2019	11.59	10.52	11.94	8.88	9.52	10.66	10.52
2020	10.52	9.68	11.17	8.62	9.42	9.81	9.89
Average	13.43	11.25	12.37	9.16	9.66	11.23	10.78

Canada has the highest average annual tax evasion among the G7 countries, with a score value of 13.43%, while the lowest annual tax evasion persists in Italy, which is 9.16%. Germany is second with a value of 12.37%, followed by France (11.25%), US (11.23%), UK (10.78%), and Japan (9.66%). These estimates are also in line with the results of Medina and Schneider (2019). They used multiple indicators-multiple cause (MIMIC) approaches to track tax evasion from 2002 to 2017. These estimates are further used to determine the factors associated with tax evasion. Medina and Schneider's (2019) estimates are also used for the robustness of the results obtained by multiple econometric models in determining the factors associated with tax evasion. Figure 1 through Figure 7 presents the graphical comparison of the tax evasion index using the CDA approach and the estimates of Medina and Schneider (2019).

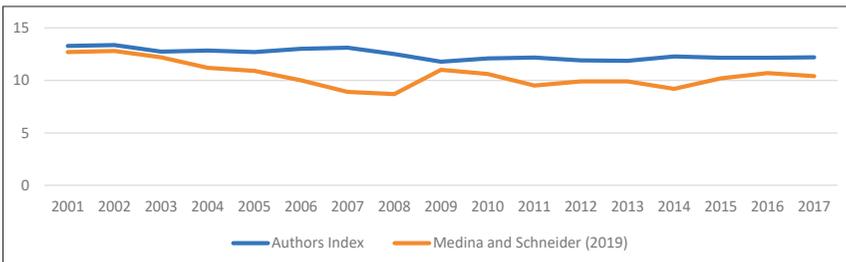
**Figure 1: Canada Tax Evasion Index**



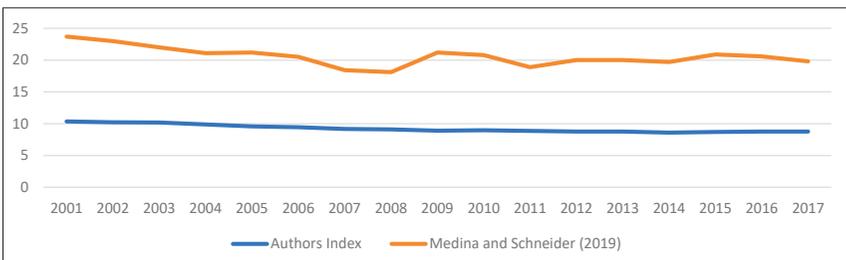
**Figure 2: France Tax Evasion Index**



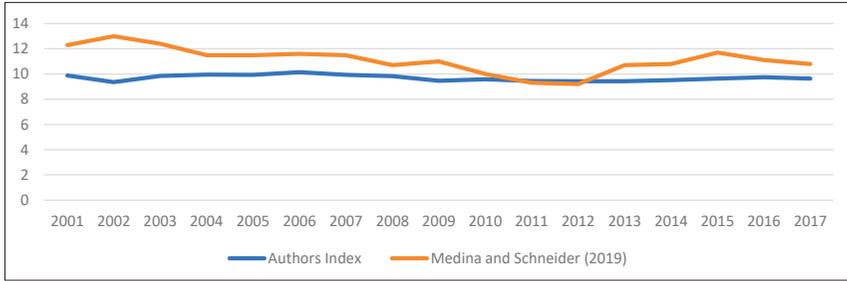
**Figure 3: Germany Tax Evasion Index**



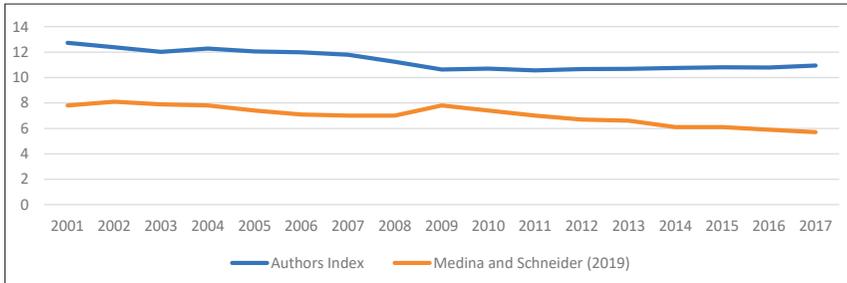
**Figure 4: Italy Tax Evasion Index**



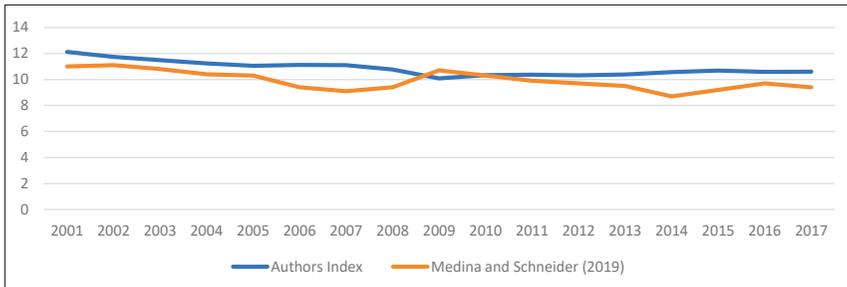
**Figure 5: Japan Tax Evasion Index**



**Figure 6: USA Tax Evasion Index**



**Figure 7: Italy Tax Evasion Index**



**Table 3:** Descriptive statistics of governance indicators of G7 countries

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
Control of corruption (CoC)	1.441	1.553	2.139	0.012	0.534	140
Government effectiveness (GE)	1.443	1.548	1.990	0.198	0.420	140
Political stability and absence of violence terrorism (PS)	0.663	0.594	1.413	-0.231	0.347	140
Regulatory quality (RQ)	1.381	1.480	1.890	0.503	0.332	140
Rule of law (RoL)	1.426	1.592	1.891	0.241	0.427	140

The mean value of control of corruption in G7 countries from 2001 to 2020 is 1.441. The highest mean value is 2.50, which represents the highest control of corruption (CoC). Similarly, the mean value of government effectiveness (GE) is 1.441 which is very close to the control of corruption. The level of political stability (PS) has lowest mean vale of 0.663 due to diversity of the countries which are formed to make G7. The mean score of G7 countries for regulatory quality (RQ) and rule of law (RoL).

**Table 4:** Results of panel unit root tests

Variables	Harris-Tzavalis	Breitung	Im-Pesaran-Shin	Hadri
Tax evasion	0.932	1.6238	0.3590	25.9192***
$\Delta$ Tax evasion	-0.0181***	-3.4968***	-5.9162 ***	-1.2348
GE	0.7260***	0.0904	-0.7949	15.9665***
$\Delta$ GE	-	-4.1759***	-9.0614***	-1.3246
CoC	0.7924	-0.3597	-0.2618	14.2819***
$\Delta$ CoC	-0.0576***	-1.3036 *	-7.3094***	0.9643
PS	0.4229***	-0.5617	-6.4006***	4.5032***
$\Delta$ PS	-	-2.5198***	-	-0.7362
RQ	0.5930***	-1.2569	-1.9537**	11.7792***
$\Delta$ RQ	-	-2.9144***	-9.6474***	-1.3826
RoL	0.6908***	-0.5413	-1.4842*	14.7525***
$\Delta$ RoL	-	-3.3004***	-10.4526***	-0.7627
VoA	0.6724***	-1.8711**	-1.7073**	11.9293***
$\Delta$ VoA	-	-5.1364***	-7.9540***	-1.5120
Bitcoin	0.8214	0.2218	2.6253	7.5779***
$\Delta$ Bitcoin	-0.3193***	-	-3.8315***	-1.3716

Considering the high correlation among the governance indicators, each indicator is run alone with Bitcoin while controlling for GDP. Table 5 presents the results of Panel OLS model where Bitcoin is an independent variable along with other set of governance variables. In six of the seven models, Bitcoin is a significant predictor of tax evasion. The adjusted  $R^2$  of the model varies from 44.8% to 60%.  $F$ -statistics for the joint hypothesis are significant and reject the joint null hypothesis of no integration among the variables. Bitcoin is found to be associated negatively with tax evasion. As the market capitalisation of Bitcoin increases, tax evasion reduces.

To the researchers' knowledge, is one of the very first attempts at empirically measuring the impact of Bitcoin on tax evasion in G7 countries. One potential reason for this may be that the money used for Bitcoin purchases/business is already out of the tax net. The very low transaction costs may also be a reason for citizens to use gains from Bitcoin in legal channels, which is supported by the literature (Holtmeier & Sandner, 2019; Koutmos, 2018; Naboulsi & Neubert, 2018). This also supports the notion that returns gained using Bitcoin are invested in the legal economy, and positive change in consumption brings more tax revenue. The literature also supports the positive role of cryptocurrencies for the economy (Holtmeier & Sandner, 2019; Koutmos, 2018; Naboulsi & Neubert, 2018; Paule-Vianez et al., 2020; Sami & Abdallah, 2020b; Yin et al., 2021; Zhang & Wang, 2021).

**Table 5:** Results of random effect panel OLS with Bitcoin as an independent variable

Independent variables	Model 1	Model 2	Model 3	Model 3	Model 4	Model 5	Model 6
lnGDP	2.494**	2.165*	2.53**	2.826**	1.675*	2.484**	2.88***
Bitcoin	-.196**	-.139	-.187***	-.195**	-.171**	-.153**	-.192**
GE		1.531*					
CoC			1.463**				
PS				.423*			
RQ					1.164**		
RoL						1.561**	
VoA							1.394**
$R^2$	0.448	0.529	0.600	0.468	0.558	0.521	0.477
$F$	5.314*	7.408**	6.175**	6.308**	3.658**	5.859**	30.986***
No. of observations	56	56	56	56	56	56	56

In the same way, Bitcoin is used as a predictor of tax evasion in the presence of both governance indicators and GDP as controls. In all models, Bitcoin is found to be a significant predictor of tax evasion. The joint hypothesis of all the models rejects the null hypothesis of no cointegration as the *F*-statistics are significant. The value of adjusted *R*<sup>2</sup> varies from 45% to 60%. To the researchers' knowledge, all these models are employed for the first time to measure the impact of cryptocurrencies on tax evasion. As such, there are hardly any studies to compare the results, but there are several studies where cryptocurrencies are found to positively impact the economy (Holtmeier & Sandner, 2019; Koutmos, 2018; Naboulsi & Neubert, 2018; Paule-Vianez et al., 2020; Sami & Abdallah, 2020b; Yin et al., 2021; Zhang & Wang, 2021).

Naboulsi and Neubert (2018) conclude that using blockchain technology reduces transaction costs, which in turn attracts foreign investments. Paule-Vianez et al. (2020) find that during periods of high economic policy uncertainty, Bitcoin, like gold, acts as safe alternative. The positive association between Bitcoin and stock returns is also confirmed by Sami and Abdallah (2020b) for non-Gulf countries. However, this is not true of Gulf countries, where Shariah laws are more stringent. The findings in the present study are also supported by Zhang and Wang (2021), which confirms the association of Bitcoin with the US exchange rate and the China stock market during periods of financial stress.

In the macroeconomic environment, a variable may change the impact of the independent variable on the dependent variable. To measure such association, interaction terms are used (Ahrens & Bothner, 2019; Richardson, 2006; Sutrisno & Dularif, 2020; Uyar et al., 2021). This makes it important to measure the impact of interaction terms of Bitcoin with governance indicators of tax evasion. Table 6 presents the interaction of governance indicators with Bitcoin in measuring its association with tax evasion.

These results confirm that the interaction of Bitcoin and voice and accountability significantly reduces tax evasion. The other interaction terms are found to be insignificant in predicting tax evasion. GE, CoC, and RoL impact tax evasion, but their interaction with Bitcoin does not impact tax evasion. These findings are supported by Yamen et al. (2018), who measure the impact of GE and voice and accountability (VoA) on tax evasion in the European Union. It is interesting and important to note that only VoA increases tax evasion, while the existence of Bitcoin and VoA reduces tax

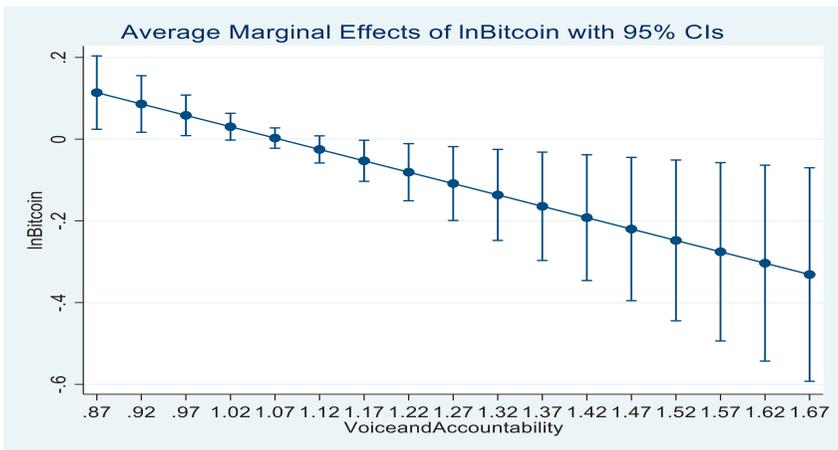
evasion. So, it is also important for policymakers not to focus on a single factor, as the existence of other factors in the economy is also important. Figures 8 to 12 plot the marginal effects of Bitcoin on tax evasion in the presence of governance indicators.

**Table 6:** Results of random effect panel OLS

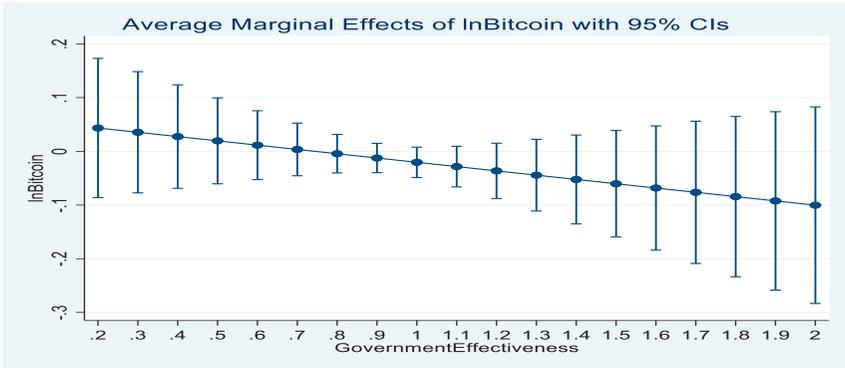
Independent variables	Model 1	Model 2	Model 3	Model 3	Model 4	Model 5	Model 6
lnBitcoin	.059	-.089***	-.049	.023	.06	.598**	2.88***
GE	3.85**						-.192**
Bitcoin*GE	-.08						
CoC		1.652*					
Bitcoin*CoC		-.007					
PS			2.333				
Bitcoin*PS			-.096				
RQ				4.144			1.394**
Bitcoin*RQ				-.101			0.477
RoL					3.801**		30.986***
Bitcoin*RoL					-.086		56
VoA						17.284***	
Bitcoin*VoA						-.557**	
No. of observations	56	56	56	56	56	56	
R <sup>2</sup>	0.497	0.628	0.132	0.727	0.617	0.760	
χ <sup>2</sup>	38.166***	24.367***	11.026**	13.861***	28.455***	75.545***	

Note: \*, \*\*, \*\*\* indicate significance at 0.1, 0.05, and 0.01 levels

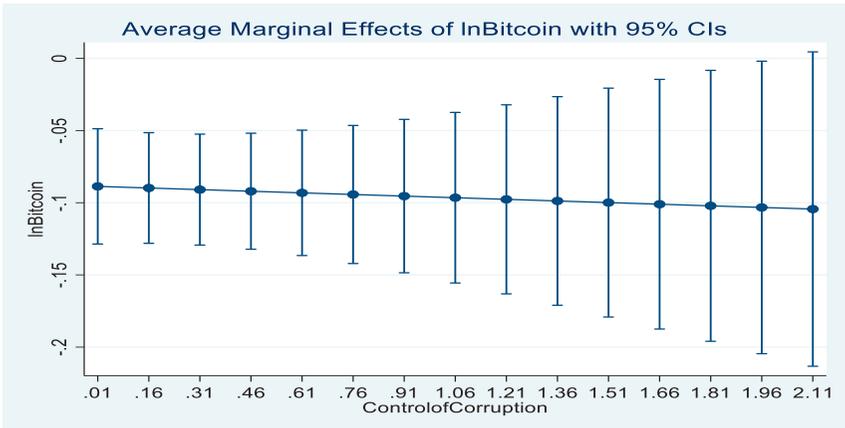
**Figure 8:** Marginal impact of Bitcoin on tax evasion at different levels of voice and accountability



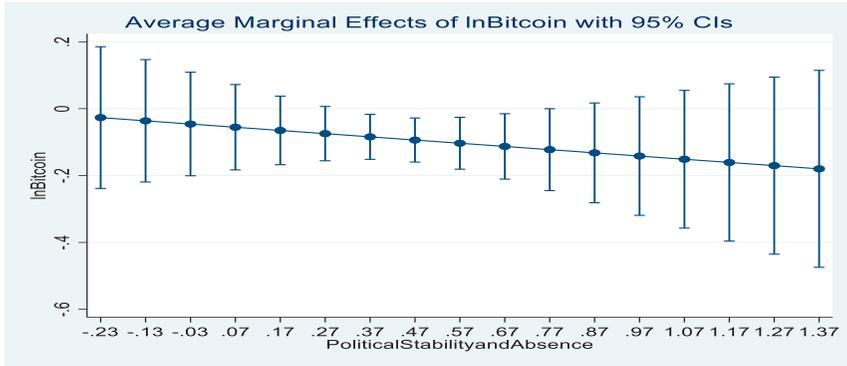
**Figure 9:** Marginal impact of Bitcoin on tax evasion at different levels of government effectiveness



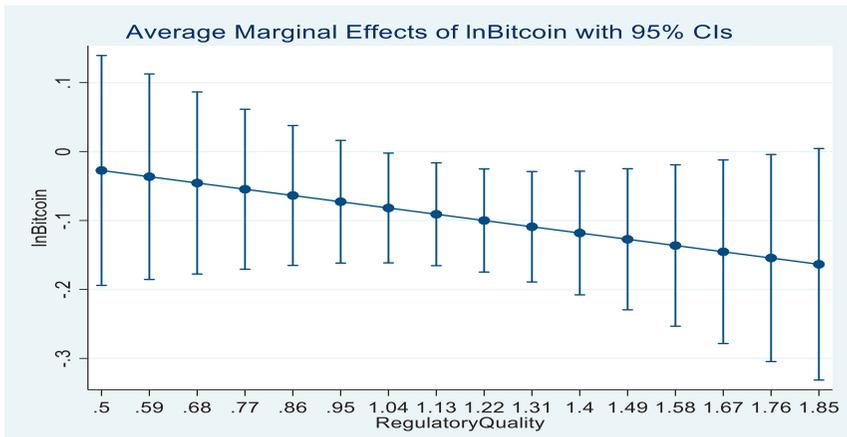
**Figure 10:** Marginal impact of Bitcoin on tax evasion at different levels of control of corruption



**Figure 11:** Marginal impact of Bitcoin on tax evasion at different levels of political stability and the absence of violence/terrorism



**Figure 12:** Marginal impact of Bitcoin on tax evasion at different levels of regulatory quality



**Table 7:** Findings of the study

Hypothesis	Description	Supported/ Not supported
H <sub>1</sub>	There is an association between cryptocurrencies and tax evasion	Supported
H <sub>2</sub>	There is an association between institutional governance and tax evasion	Supported
H <sub>3</sub>	Institutional governance moderates the association between cryptocurrencies and tax evasion	Supported

## 5. Conclusion

This study aims to provide up-to-date estimates of tax evasion in G7 countries, focusing on the period from 2001 to 2020. The CDA is employed to estimate tax evasion, and these estimates are then used to analyse their association with cryptocurrencies, specifically Bitcoin. The study incorporates a set of institutional governance indicators as independent variables along with cryptocurrencies, and their interaction terms with cryptocurrencies are considered. The findings of the study reveal that Bitcoin is a significant predictor of tax evasion. This study represents one of the first empirical attempts to measure the association between tax evasion and cryptocurrencies. Additionally, the study concludes that governance indicators play a crucial role in predicting tax evasion. Specifically, VoA is found to moderate the association between tax evasion and cryptocurrencies. As the level of VoA increases, the impact of Bitcoin on tax evasion decreases.

The study also highlights that higher levels of governance indicators reduce the impact of Bitcoin on tax evasion, indicating that strengthening governance can help mitigate tax evasion. The implications of the study suggest that by focusing on governance indicators, tax evasion can be effectively controlled. However, there is an optimum level of governance, as crossing this threshold may lead to an increase in tax evasion, as depicted in Figure 8 through Figure 12. Furthermore, at higher levels of VoA, the impact of Bitcoin on tax evasion is minimised. Therefore, policymakers are recommended to prioritise governance indicators as a means to directly or indirectly reduce tax evasion. The study also constructs a tax evasion index specifically for G7 countries, which can be utilised by researchers interested in this field. It is worth noting that in some instances, governance indicators may present confusing (positive) determinants of tax evasion. Future research could explore these relationships in a nonlinear manner to gain a more comprehensive understanding.

Measurement of tax evasion and cryptocurrencies is still challenging, as only Bitcoin is selected and CDA is utilised to measure the tax evasion. This seems to be a limitation of the study. Expanding the sample period and availability of macroeconomic variables at higher frequency may improve the results in terms of accuracy. Advanced non-linear techniques may also be employed to accurately measure the association of cryptocurrencies and tax evasion.

## CRedit Author Statement

**Niaz Ahmed Bhutto:** Conceptualisation, Design of Methodology, Data Collection. **Allah Ditta Nawaz:** Formal Analysis, Writing – Original Draft. **Shabeer Khan:** Supervision, Writing – Review and Editing.

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