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Cryptocurrency and the Foreign Account Tax Compliance Act

An empirical study on cryptocurrency as a method for tax evasion

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Preface

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Abstract

The Foreign Account Compliance Act (FATCA) was passed into law in 2010, the objective was to reduce offshore tax evasion. We examine one avenue left open for U.S. based taxpayers, namely cryptocurrencies. We study the short-term effect of FATCA on bitcoin trading volume, making use of available trading data between different fiat currencies to bitcoin. We document a statistically significant increase in bitcoin trading volume with British pound after the endorsement of FATCA. We argue that this is indirect evidence showing U.S. based taxpayers avoiding the information exchange under FATCA.

Keywords – Cryptocurrency, FATCA, Tax evasion, United States (U.S.)

Contents

1 Introduction

"…revenue from taxing cryptocurrencies is non-negligible and will be if the market of cryptocurrency continues to grow" (Thiemann, 2021, p. 1).

In the era of globalization and digitalization, borders between countries have become less relevant, thereby increasing capital mobility. This has provided tax evaders with various opportunities to evade domestic tax duties. While capital held in tax havens isn't always illegal, it can be if the interest income isn't recorded in the homeland jurisdiction. Recent studies estimate that the equivalent of around 10% of global gross domestic product (GDP) is stored offshore (Alstadsæter et al., 2018)

Recent years have seen a gradual increase in regulations to combat offshore tax evasion. Tax evasion is, by definition, the illegal withholding of tax liabilities (OECD, 1998). The biggest and most encompassing treaty to meet the threat of international tax evasion is the Foreign Account Tax Compliance Act (FATCA), as introduced by the United States, and its "twin" regulation in the OECD countries, the Common Reporting Standard (CRS) (Ahrens & Bothner, 2020). Before the implementation of these treaties, the collection of information was done on a bilateral and often upon request. With the new regulation, information would be collected on an automatic basis. Research shows that the treaties' have been, in large part, successful in increasing tax compliance. In addition, the OECD has seen a global reduction in foreign-owned bank deposits in international tax havens of 410 billion USD, an equivalent of 24% from Q2 2008 to Q1 2019 (OECD, 2019). According to the OECD, the most recent rounds of AEOI exchanges resulted in the disclosure of 84 million bank accounts with a total value of $11.2 trillion. The denominator, on the other hand, is not sufficiently recognized: what financial wealth is not captured by the reporting framework (Collin, 2021). As would be expected, there is evidence that individuals either shift money from compliant tax havens to non-compliant tax havens or into alternative assets not covered under the agreements (De Simone et al., 2020; Johannesen & Zucman, 2014; Menkhoff & Miethe, 2019). This thesis investigates one potential way for investors to circumvent

the automatic exchange of information – cryptocurrencies. Although anecdotal evidence from several governmental tax authorities shows that cryptocurrency is likely used for tax evasion (Department of the Treasury, 2021; IRS, 2014). We will empirically investigate if cryptocurrency is used for tax evasion purposes in the context of avoiding the collection and exchange of information between governments, which (to our knowledge) haven't been studied in this context. Earlier studies on tax evasion and cryptocurrencies show that cryptocurrencies have inherent tax haven-related properties (Marian, 2013, 2017, 2021). Cryptocurrencies have often been mentioned as likely avenues for tax evasion (De Simone et al., 2020; Noked, 2018; Omartian, 2017).

This study, therefore, tries to empirically investigate if cryptocurrency is used to avoid the automatic exchange of information (AEOI) through the following research question:

Is cryptocurrency used to circumvent the automatic exchange of information?

The rest of the thesis is divided into five sections. In section 2, we review previous literature, explain concepts, and discuss empirical evidence of the success of FATCA and CRS together with a critical viewing of some of the loopholes the regimes might possess. We also describe the essential characteristics of cryptocurrencies and illustrate how they might be used to circumvent the AEOI. In section 3, we present the data and how the sample is constructed. In Section 4, we will present our research methodology. In section 5, we show the result from our analysis. In Section 6 we summarize the results and point out potential limitations. In Section 7, we share our concluding remarks.

2 Theory & Literature Review

Tax evasion has been the topic of extensive research in recent decades. Although it is logical to assume that the phenomena of tax evasion have existed since the outset of taxes itself, formal theories of tax evasion have a more recent origin. Allingham and Sandmo (1972) outline a model for the optimal level of tax evasion. They build on the model of economic crime first developed by Becker (1968) and extend it to the realm of tax evasion. The optimal level of tax evasion depends in this model on detection risk, the size of the penalty, and the individual degree of risk aversion. In this model, taxpayers will maximize the expected utility. According to their model, tax evasion is controlled by the proportion of fines and the likelihood of getting caught. The model has been extended in various directions; behavioral economics research has found that small changes in the perceived probability of detection can affect taxpayer behavior. Even small increases in detection risk may substantially impact tax compliance (Carnes & Englebrecht, 1995; Durlauf & Nagin, 2011).

Two closely linked concepts in taxation literature are tax evasion and tax avoidance, although in practice they can be hard to distinguish. Alm (1999) defines tax evasion as the intentional and illegal actions taken by individuals to reduce their legally due tax obligations. Individuals and businesses can evade taxes by underreporting income, sales, or wealth, overstating deductions, exemptions, or credits, or neglecting to complete required tax forms. The other concept is characterized as tax avoidance, or the legal reduction in tax liabilities through tactics that take full advantage of the tax code, such as income splitting, tax delay, and tax arbitrage between income that is taxed differently (Alm, 1999). These definitions, with a few variations, are well recognized in the taxation literature (Alstadsæter et al., 2019; Kirchler et al., 2003; Sandmo, 2004; Slemrod, 2007). However, because tax avoidance and evasion have similar effects, economists recommend examining their consequences together rather than separating them (Cross & Shaw, 1981). For the rest of the thesis, we will mainly focus on the illegal part of tax compliance, i.e., tax evasion.

As a result of globalization, borders between countries have become less relevant. This has provided tax evaders with various opportunities to avoid domestic tax duties. Free capital flow provides tax evaders an incentive to move wealth and revenues from their homeland to offshore

areas with low taxes and secrecy, namely tax havens. A tax haven is a region and/or a country that attracts foreign investments by requiring minimal or no taxes from investors or corporate entities. Most definitions go even farther, limiting tax havens to countries with strict banking secrecy and little transparency. According to an OECD report (1998), tax havens have the following key characteristics: No or only nominal taxes and a lack of effective information exchange. Cross-border wealth management began in Switzerland in the 1920s, but there was no other country where assets could be easily hidden until the 1980s. Tax havens have grown in popularity since the 1980s (Alstadsæter et al., 2018). Modern technology and financial innovation have made it simpler for individuals, and the number of tax havens and individuals operating in these havens have grown considerably in the last decades. Alstadsæter et al., (2018) indicate that because the wealthiest people hide enormous sums of wealth in tax havens, their share of wealth is higher than previously thought. Leaks provide an unprecedented opportunity to learn more about how people and which types of people hide their money in tax havens. The leak of customer information from Panamanian law firm Mossack Fonseca is the most high-profile of them (the Panama Papers) (Collin, 2021). The OECD (2000) identified 35 countries with the abovementioned characteristics and described them as tax havens. According to the Tax Justice Network's State of Tax Justice 2021, global tax evasion by multinational firms and wealthy individuals costs countries $483 billion every year (Tax Justice Network, 2021). The list includes some of the most significant economic countries in the world.

By allowing private tax evasion, the United Kingdom and its network of Overseas Territories and Crown Dependencies collectively cause an $87.9 billion tax loss to the rest of the world (Tax Justice Network, 2021). According to the Tax Justice Network's Financial Secrecy Index 2022, a ranking of the world's most significant suppliers of financial secrecy, British overseas secrecy hubs have lowered their total supply of financial secrecy to the world but remain, along with the UK, the world's most significant enabler for tax evasion (Eye, 2022). Guernsey and Jersey have fewer than 165,000 inhabitants but more than 91 billion USD in total external bank liabilities (Menkhoff & Miethe, 2019). Furthermore, The UK, with its corporate tax haven network, is by far the world's greatest enabler of corporate tax avoidance and has done more to break down the global corporate tax system than any other country, accounting for over a third of the world's corporate tax avoidance risks, according to the Corporate Tax Haven Index (Ateş et al., 2020).

While tax havens have increased offshore accounts, a lot of the capital finds its way back to the evader's country of origin. Hanlon et al., (2015) investigate how changes in the incentives to evade and the risks of detection affect international portfolio investment. Specifically, they look at a practice of offshore tax evasion known as "round-tripping," in which U.S. citizens hide funds in tax haven entities and then reinvest those assets in U.S. equities and bonds. Their research builds on the concept of home-bias from the literature on international equity holdings. The term home bias refers to investors who have developed a strong preference for stocks from their own country (Cooper et al., 2018). Hanlon et al., (2015) findings imply that home bias is stronger than initially assumed. Some of what seem to be foreign investments in research on international holdings are domestic investors evading taxes. Because overseas investors in U.S. securities are taxed far more favorably than domestic investors, these individuals can evade the majority of the tax on investment income by making it appear as if the investments are actually coming from actual foreign investors. In addition, if investing from tax haven entities, the evader does not pay taxes on capital gains. Sharman (2012) explains the continued growth in offshore finance by the rise of new developing country markets. More generally, the fact that there are more and more alternative markets means that G7 states no longer have the important power they used to have when they threatened to close their markets.

In 2001, the U.S. started to target these tax havens by targeting foreign financial institutions (FFI). A FFI could register as a Qualified Intermediary (QI). The QIs acted as intermediary tax authorities by determining if a U.S. withholding tax liability existed for their clients (Blank & Mason, 2014). In 2008, a former UBS investment banker revealed that UBS encouraged U.S. taxpayers to form foreign shell corporations that would open offshore accounts at UBS. UBS then took the position that no withholding was required regarding the payments to the foreign shells, even though the bankers knew that the beneficial owners were U.S. residents. UBS eventually agreed to reveal the names of 4,500 of the estimated 20,000 U.S. holders of offshore accounts at UBS under a separate arrangement (Blank & Mason, 2014). The magnitude of the offshore banking industry has been shown by several recent worldwide data leaks and whistleblowing instances like the one for UBS. In reaction to the QI and other bilateral agreement regime's flaws and the heightened focus on the offshore evasion epidemic because of the UBS deferred

prosecution agreement, the United States was the first high-income country to take an aggressive stance against the non-reporting of offshore income and the resulting offshore tax evasion.

2.1 Automatic Exchange of Information

The UBS whistleblower case mentioned above called for a more encompassing and far-reaching policy, emphasizing both revenue loss and perceptions of fairness. The world has attempted to combat tax evasion methods such as offshore havens, but early efforts were mainly regarded as ineffective in the past. Unfortunately, because of limited international coverage which can be easily circumvented, and insufficient information accessibility, these efforts were generally unsuccessful (Caruana-Galizia & Caruana-Galizia, 2016; Hanlon et al., 2015; Johannesen, 2014; Johannesen & Zucman, 2014; Sharman, 2012). FATCA, enacted in 2010, was intended to solve these problems (I. Grinberg, 2012).

FATCA was the first treaty to include automated information exchange on tax evasion. The United States has signed several intergovernmental agreements (IGAs). Today, this is the primary method governments rely on for tax information disclosure on offshore entities. FATCA requires foreign financial institutions (FFIs) to report to the Internal Revenue Service (IRS) the financial assets of US taxpayers. The threat of a 30% withholding tax on all payments made to the FFI and its accountholders by US organizations (such as dividend payments by US firms) is intended to induce FFIs to cooperate (Dharmapala, 2016; I. Grinberg, 2012). The law intends to limit the ability of U.S. citizens to evade U.S. taxes using offshore accounts and banks. The FATCA provisions were passed on March 18, 2010. Under FATCA, FFIs are required to report the name, address, and other identifying information for each account holder, that is; a U.S. person; the account number and balance; and any gross dividends, interest, and other income paid to the account.

After the U.S. initiative to implement FATCA, the OECD developed a broader "global FATCA" framework named the Common Reporting Standard (CRS) in 2014. The CRS is primarily influenced by FATCA's institutional design (Ahrens & Bothner, 2020). At the same time, the intergovernmental approach to FATCA reporting differs from the CRS in some ways. The differences are due to the CRS's multilateral nature and that FACTA is one-directional even though the U.S. has reciprocal agreements. Other differences include the concept of citizenship-

based taxation and the presence of a significant and comprehensive FATCA withholding tax. Given these characteristics, the fact that FATCA is an existing system with many similarities to the CRS, and the expected progress toward widespread CRS participation, the US not requiring look-through treatment for investment entities in non-participating jurisdictions is compatible and consistent with the CSR (Ahrens & Bothner, 2020). Even though FATCA is viewed as a successful treaty in combating offshore tax evasion, it possesses some loopholes in contrast to CSR. When the total value of all accounts held by an FFI is less than $50,000, it is not required to record any depository accounts held by U.S. beneficiaries. An FFI is also exempt from reporting any account owned by another FFI that complies with FATCA reporting requirements. A jurisdiction's ability to automatically share information with the United States largely depends on the United States' willingness and ability to reciprocate by exchanging comparable data. Furthermore, the 30% penalty will not be withheld from FFIs if the beneficial owner is a foreign government, an international agency, a foreign central bank, or anyone else whom the US Treasury believes poses a negligible risk of tax evasion (Paul, 2018). FATCA and CRS together mark a new era in international tax cooperation because they cover a lot of ground and make it hard for people to get around the law (Ahrens & Bothner, 2020).

Existing evidence indicates that the automatic exchange of information agreements has been shown to have a causal impact on the amount of offshore deposits controlled by foreigners (Casi et al., 2020; Johannesen & Zucman, 2014; Menkhoff & Miethe, 2019). De Simone et al. (2020) document a $7.8 billion to $15.3 billion decrease in equity foreign portfolio investment to the United States from tax haven countries after FATCA implementation, consistent with a reduction of "round-tripping" investment attributable to U.S. investors' offshore tax evasion. When testing total worldwide investment out of financial accounts in tax havens post-FATCA, they found a decline of $56.6 billion to $78.0 billion. Ahrens and Bothner (2020) investigate FATCA and the CRS impact on tax evasion by conducting a difference-indifference analysis of cross-border asset data. Their results show that the treaties are successful. Without the automatic exchange of information, household assets in tax havens that aren't disguised behind corporate identities are anticipated to be 67 percent lower than they would have been. Furthermore, increased treaty circumvention through identity concealing or asset shifting to non-compliant jurisdictions does

not offset this drop. Omartian (2017) looked into the effects of FATCA and found that investors use offshore entities less when they have doubts about how well banks keep secrets. This is consistent with the model for optimal taxation by Allingham and Sandmo (1972).

Individuals seem to be exploiting some of the weaknesses in FATCA. Tax evaders appear to be coming up with new ways to get around regulatory restrictions to hide their offshore holdings, such as redirecting deposits to non-compliant tax havens, seeking regulatory loopholes in non-havens, and placing their money into new disguises that escape regulatory regulations (Menkhoff & Miethe, 2019). Langenmayr and Zyska (2021) show analytically that high-income individuals acquire new citizenship to lower the probability that their tax evasion is detected through information exchange. They find that deposits in tax havens increase after a country starts offering a citizenship-by-investment program, providing indirect evidence that tax evaders use these programs. Janskỳ et al. (2022) find that investors react to changes in financial transparency by relocating their assets to offshore financial centers, which remain, or have recently become, more financially secretive than other countries. De Simone et al. (2020) provide evidence of increased expatriations of U.S. citizens and more significant investment in alternative assets not subject to FATCA reporting, such as residential real estate and artwork. Johannesen and Zucman (2014) investigated the effort of G20 countries to compel tax havens to sign bilateral treaties providing for the exchange of bank information. Policymakers have celebrated this global initiative as the end of bank secrecy. This study shows that rather than repatriating funds, the results suggest that tax evaders shifted deposits to havens not covered by a treaty with their home country.

What are the primary channels of tax evasion in the AEOI era? Tax evaders can first invest in non-financial assets offshore. Under FATCA and CRS, direct ownership of non-financial assets, including real estate, precious metals, artwork, and collectibles, is not reported to foreign tax authorities. Cryptocurrencies are also exempt from AEOI if they aren't owned by financial institutions and aren't classified as financial assets (Noked, 2018). When national stock capital gains tax regulations are applied to bitcoin capital gains, a tax revenue of around 850 million EUR is predicted in 2020 (Thiemann, 2021).

2.2 Bitcoin

Bitcoin and other cryptocurrencies represent a great challenge for tax authorities. On the one hand, there a plenty of new intermediates functioning on the bitcoin network that will almost probably be subject to regulation and enforcement. On the other side, because it is an open protocol and a decentralized network, it cannot be regulated by any firm or central server (Brito et al., 2014).

Bitcoin was first mentioned back in 2008 when an unknown author published a white paper named "Bitcoin: A Peer-to-Peer Electronical Cash System." The actual author, or authors, is not known as they used the pseudonym Satoshi Nakamoto to conceal their identity. Nakamoto created the blockchain technology to support an electronic payment system based on cryptographic proof instead of trust. A blockchain is a decentralized, peer-to-peer database that can accommodate an ever-growing number of transactions (Vasquez, 2021). Yermack (2015) describes the decentralization feature as even if it is not fully distributed, it is essential that a single person does not control it, nor a group of persons or an entity. Using consensus algorithms, each transaction, referred to as a "block," is encrypted, time-stamped, and authenticated by all authorized database members (Vasquez, 2021). The validation algorithms certify the transaction by preventing issues (such as "double spend," which occurs when a given quantity of coins is spent twice in the same transaction). Once a transaction is validated, the details are saved on a public ledger generated through an algorithmic process known as "mining" (Subramanian, 2018). Because it permits the decentralized network to operate without third-party oversight, the public-ledger architecture is vital to bitcoin's evolution. This lowers transaction costs, enhances bitcoin's liquidity, and adds the necessary safeguards to maintain consumer trust (Singh, 2015).

Bitcoin is a decentralized, partially anonymous digital currency that is not backed by any government or other legal body and is not redeemable for gold or any other commodity (R. Grinberg, 2011). Bitcoin for example, are not entirely anonymous but rather pseudo-anonymous (Murphy et al., 2015). To trade bitcoin, users must each create their own key pair. A public key acts as an account identifier, and a private key is used to sign transactions (Moser, 2013). The public key can be referred to as the user's pseudonym in the blockchain universe. Since all

transactions are stored publicly, the sender's anonymity relies on the pseudonym to not be linked to their true identity (Moser, 2013).

Nevertheless, it is harder to determine how the financial markets view cryptocurrencies such as bitcoin, and it is even harder to know where and what cryptocurrencies might go next. Even though it has been over a decade since the whitepaper about bitcoin was introduced, it is debatable whether bitcoin can be defined as a currency, a commodity, or an investment asset because it has so many comparable characteristics to other currencies, gold, stocks, and bonds. Baur and Dimpfl (2021) find that the volatility of bitcoin prices is about ten times higher than the volatility of major exchange rates. They claim that it is too costly to use as a medium of exchange and a unit of account due to its excessive volatility. Bitcoin's daily value must evolve more stably than it does today to act as a store of value and a unit of account in commercial marketplaces. It has to become more than a curiosity (Yermack, 2015). However, bitcoin's lowest monthly volatility is less volatile than gold's and foreign currencies' highest monthly volatility (Dwyer, 2015).

To some extent, trading with bitcoin can be compared to stock trading. The trade itself is open for the public to watch, but because anonymity is one of the cornerstones of blockchain technology, one will not see who has traded with whom. This is comparable to the level of information released by stock exchanges, where the time and size of individual trades, also known as the "tape," are made public without revealing the identities of the parties (Nakamoto, 2008). Kwon (2020) suggests that cryptocurrencies are digital assets created online and designed to be used as forms of exchange with the same intention as traditional money. Janson and Karoubi (2021) findings imply that bitcoin has improved its value as a store of value, which is the most important characteristic a currency must possess to become a medium of exchange. In November 2021, Mastercard said it would allow partners to offer their customers the ability to purchase, sell, and hold cryptocurrencies through a digital wallet. Pavilion Hotels & Resorts is the first international hotel chain to accept virtual currency payments (Viitala, 2022). In March, the IRS recognized cryptocurrencies as property (IRS, 2014). For federal tax purposes, virtual currency is treated as property. General tax principles applicable to property transactions also apply to transactions using virtual currency.

Bitcoin also relies on the use of open-source software and a peer-to-peer network. Open-source software is similar to a peer-to-peer network because software development is organized by the

participants, programmers in this case, and no one is formally in charge of development due to ownership of the software (Dwyer, 2015). Because it is an open protocol and a decentralized network, it cannot be regulated by any firm or central server. On the other hand, there are plenty of new intermediates functioning on the bitcoin network that will almost probably be subject to regulation and enforcement (Brito et al., 2014).

Several digital currency exchanges are operating in a centralized manner today, just like financial institutions. In 2018, 99% of all cryptocurrency transactions were done through a centralized exchange (Sexer, 2019). A centralized system has advantages for both market participants and regulators; market participants benefit from liquidity offered by market makers on the exchange and don't have to worry about execution details or counterparty default risk. Regulators can rely on custodians for rule enforcement, accountability, and data reporting (Shapiro, 2018). Centralized exchanges also keep their systems off-chain (Sexer, 2019). Gudgeon et al., (2019) define off-chain transactions as protocols that i) do not publish every transaction on the blockchain immediately (contrary to on-chain transactions) and ii) entirely rely on the consensus algorithm of a parent chain. However, the centralized exchanges are shown to be hackable, react badly to uncommon blockchain events like hard forks, and carry a high regulatory risk. All of these are things that Nakamoto's original plan for blockchain technology was to solve.

Decentralized systems, on the other hand, ensure transaction privacy and security while building trust among platform users (Subramanian, 2018). It is now possible for two parties to trade one cryptocurrency for another without trading via a centralized exchange and without needing to first deposit money or cryptocurrency with a custodian or the exchange using smart contracts (Wright & De Filippi, 2015). The decentralized finance (DeFi) field has seen a rise in crypto trading activity and rapid development over the last year; in January 2022, decentralized exchanges (DEX) with automated market maker (AMM) protocols had a market capitalization of more than $100 billion (Xu et al., 2022). The market price of an asset is determined by the latest matched buy and sell orders on traditional order-book-based exchanges, which are ultimately driven by the item's supply and demand. On the other hand, a liquidity pool functions as a single counterparty for each transaction on an AMM-based DEX, with a so-called conservation function that prices

assets algorithmically by only allowing the price to move along predetermined trajectories (Xu et al., 2022). The DEX opens a whole new spectrum of financial instruments in the cryptocurrency world. On the other hand, decentralization generates a variety of complex regulatory difficulties. Without the convenient information reporting provided by custodians operating on centralized exchanges, the IRS, for example, may have trouble tracking financial activities (Shapiro, 2018). Illegal activities such as fraud and money laundering were reasons behind China's banning of all cryptocurrency trading exchanges in September 2017. Before the prohibition, Chinese investors dominated the Bitcoin market (Chen & Liu, 2022). Borri and Shakhnov (2020) discovered that Chinese investors had shifted some of their bitcoin trading to decentralized peer-to-peer exchanges (P2P), where authorities have less oversight and control because buyers and sellers are directly matched without the need for a centralized financial institution to hold any funds during the transaction.Today, most cryptocurrency exchanges are hybrid solutions that combine the benefits of centralized and decentralized marketplaces (Sexer, 2019).

While the current AEOI regimes do not cover cryptocurrency, there are moves to incorporate cryptocurrency under FATCA and CRS. The emergence of multiple centralized exchanges has provided tax authorities with an opportunity. The European Commission introduced DAC 8 in 2021 (Calleja, 2022). Later that same year, the Biden administration was the first U.S. administration to include cryptocurrencies and taxation in their budget proposal. On May the 28th, 2021, the White House released a statement: "expand broker information reporting concerning cryptocurrency assets" (Department of the Treasury, 2021). The proposal would require brokers, such as entities like U.S. cryptocurrency exchanges and hosted wallet providers, to report information relating to certain passive entities and their substantial foreign owners (Department of the Treasury, 2021). The President's proposals would create a comprehensive financial account information reporting regime intended to increase the visibility of gross receipts and deductible expenses to the IRS, enhance the effectiveness of the agency's enforcement measures, and encourage voluntary compliance (PWC, 2021). The DAC 8 will almost certainly come with several new regulatory requirements, including new KYC and reporting requirements for cryptocurrency asset service providers and new disclosure obligations for cryptocurrency asset owners (Calleja, 2022).

3 Data

3.1 Data on bitcoin trading volume

In this thesis, we focus on bitcoin. Bitcoin was the first cryptocurrency and still makes up 46% of the total market capitalization (TradingView, 2022). Investors can purchase bitcoins using fiat currencies or other cryptocurrencies on a variety of exchanges all over the world. The data is collected from data.bitcoinity.org. Bitcoinity offer information on a range of bitcoin metrics such as price, trades per minute, volume, and market capitalization. We collect monthly bitcoin volume data for several fiat currency pairs, measured in units of bitcoin.

Bitcoinity collects data directly from cryptocurrency exchanges, mostly centralized but also a few decentralized exchanges. We can identify what exchange the volume originated from. Smaller exchanges are grouped together, whereas larger exchanges are identified separately. We want the entire bitcoin-to-fiat trading volume; thus, we aggregate exchange-specific trading volume into one variable for each fiat currency. However, it is important to note that the exchanges differ in each period. This is owing to a particular exchange either not yet being operational or ceasing operations due to regulation or insolvency. In the case of new exchanges and bankruptcy, we expect a redistribution of trading volume to other exchanges. Mt. Gox, which at one point was the world's busiest bitcoin exchange collapsed in 2014 after having lost 850 000 Bitcoin (Mochizuki, 2014). Although this would logically have an impact on trading volume, we anticipate that the volume (in large part) will be reallocated to other exchanges. In the instance of Mt. Gox and the Japanese yen, we can see that once Mt. Gox filed for bankruptcy, other exchanges got a bigger share of the volume from Japanese yen to bitcoin. This is also true for other currencies that Mt. Gox offered such as the euro and U.S. dollar.

In the case of regulation, exchanges may be required to shut down operations or stop providing trading in a certain currency. This provides a bigger challenge to our analysis. The most pressing example is related to Chinese authorities, we have no available data on the Chinese yuan after 2017. This is the result of the "China shock", referring to regulatory change that severely restricted bitcoin trading (Borri & Shakhnov, 2020). Borri and Shakhnov (2020) also document a spillover

to other markets, namely increase in the volume of bitcoin transactions for Korean won, Japanese yen and U.S. dollar. We take two steps to mitigate the effect of the "China shock" in our analysis. First, we opt to remove Chinese yuan from our dataset. Second, we structure the period in such a way to avoid the initial spillover effect. The pretreatment period is also structured such that the increased level of trading is accounted for.

The number of tradable fiat currencies also vary, dependent on the time period examined. The bitcoin to fiat currency pairs we keep have same number of observations in the pre- and posttreatment window. Also, we keep the same sample of currencies across the two events. In total we identified eight fiat currencies to bitcoin pairs that is interesting for further analysis. In Table 1 we report descriptive statistics for the monthly bitcoin trading volume.

Table 1

Descriptive Statistics on bitcoin trading volume

Currency	Obs	Mean	Std. Dev.	Median	Min	Max
AUD	128	15,068	14,202	10,627	1.0	96,186
CAD	127	14,560	15,072	9,207	2.8	81,469
EUR	133	296,343	219,275	261,831	14.0	887,888
JPY	126	173,636	238,232	47,154	6.9	903,823
PLN	128	36,544	25,683	33,863	1.0	137,214
RUB	128	10,005	11,185	3,873	0.0	35,084
USD	133	1,863,470	1,107,806	1,589,256	1,783.4	6,330,487
GBP	128	67,615	43,647	54,234	7.7	165,349

Notes: The table depict the monthly bitcoin trading volumes with different fiat currencies in the period from August 2011 to January 2022. All values except observations are in units of bitcoin.

The descriptive statistics in Table 1 show the period from August 2011 to January 2022. Our analysis will subset the data into smaller periods. We classify the currencies into a treated and control group. The currencies in our control group (untreated) are those we expect to have no reaction to regulation targeting U.S. based taxpayers (AUD, CAD, EUR, JPY, PLN and RUB) and the second group are the currencies we expect a reaction to following regulation targeting

U.S. citizens (USD and GBP). A more detailed explanation of our identifying assumptions is found in the methodology section.

3.2 Data on U.S. regulation

We have identified two regulatory changes to use in our empirical analysis. The first (and most important) event we investigate is $PostFATCA$. FATCA has undergone several key development phases but we focus on the endorsement date of FATCA, set in February 2012. Even though the legislation was enacted in 2010, it was unclear whether it would have any real impact (Ahrens & Bothner, 2020; Belnap et al., 2019; De Simone et al., 2020; Dharmapala, 2016). In February 2012, the U.S. Treasury Department issued a joint statement with five European nations that have committed to the AEI. In this statement, they also outlined how the treaties would be implemented. (U.S. Treasury, 2012). Our event date selection is based prior research on FATCA (Ahrens & Bothner, 2020; De Simone et al., 2020). Another key development phase is the date of the effective date, we do not include this in our analysis for two reasons. First, we expect the reaction to happen in anticipation of the reaction date. Second, the test focusing on those dates would be exposed to confounding factors as the period overlaps with CRS (De Simone et al., 2020).

The second event we are interested in is the Biden budget proposal set in April 2021. This provision would expand reporting requirements and would apply to crypto asset exchanges (PWC, 2021). It is important to note that the budget proposal as laid out in the 2021 Biden budget proposal would only apply to U.S. based cryptocurrency exchanges.

4 Methodology & Design

In this thesis, we use two empirical models. First, we use a difference-in-difference analysis to estimate the average short-term effect of FATCA and the Biden budget proposal. Second, we use an event study to evaluate the common trend assumption and to closer examine the dynamic response to FATCA and the Biden budget proposal.

Our identification strategy partly build on that used by De Simone et al. (2020) and Hanlon et al. (2015). In that non-U.S. citizens in other countries should be unaffected and indifferent to regulation targeting U.S. investors. Next, we expect U.S. based taxpayers to trade with U.S. dollar or with British pound. The propensity to trade with U.S. dollar is based on the home-bias literature, using currency as a proxy for country. We run separate regressions on British pound, the U.K. is a financial secrecy hub so we expect U.S. based tax evaders to also use this currency. On both events outlined in Section 3, we analyze the effect on U.S. dollar, dropping British pound from our sample. Similarly, we drop U.S. dollar from the sample when analyzing the effect on bitcoin trading volume with British pound.

4.1 Difference-in-difference analysis

We use a difference-in-difference design to estimate average effects. To assess empirically the effects of FATCA and the Biden budget proposal on trading volume, we estimate the following equation:

$$\log(Volume_{it}) = \beta_1 Event_t * Currency_i + \gamma_t + \theta_i + \epsilon_{it} \quad (1)$$

The response variable $\log(Volume_{it})$ represents the log of bitcoin trading volume in currency i at time t. The $Event_t$ variable is one of two post-period dummy variables: (i) $PostFATCA$, a one post-period dummy marking the period after FATCA was endorsed; or (ii) $PostBiden$, a one post-period dummy marking the period after the Biden budget proposal. $Currency_i$ is a binary

variable, taking the value of one for trading volume in: (i) USD; or (ii) GBP. As mentioned, we run separate regressions for USD and GBP, dropping the other currency from our control group.

We include a currency fixed effect θ_i to control for time-invariant factors that might affect trading volume. We also include time fixed effects γ_t to control for time-varying changes in bitcoin trading volume, such as those related to overall interest in bitcoin. The error term is denoted by ϵ_{it}. We cluster the standard errors at the currency level.

4.2 Event study

Our event study design is based on Casi et al. (2020) and Schmidheiny and Siegloch (2019). We replace the one post-period dummy in Equation (1) with separate time dummies D_t^j. The event study design takes the following form:

$$\log(Volume_{it}) = \sum_{j=-\underline{j}}^{\overline{j}} \beta_j D_t^j * Currency_i + \gamma_t + \theta_i + \epsilon_{it} \quad (2)$$

The variable of interest are the dummies D_t^j indicating a point in time j periods from the treatment and its interaction with $Currency_i$, which is a dummy taking the value of one for bitcoin trading volume in: (i) USD; or (ii) GBP. We still measure the effect on the log of bitcoin trading volume $\log(Volume_{it})$ in currency i during month t. The effect window is limited to $\overline{j}$ periods after and $|\underline{j}|$ periods before the event. We drop the indicator for one period prior to the event D_t^{-1}, thereby expressing the treatment effects β_j relative to this period. This coefficient is therefore by design equal to zero with no confidence interval, the other coefficient is plotted together with a 95% confidence interval. To assess the parallel trend assumption of the research design, we look at the pretreatment period, e.g., $|\underline{j}|$ periods before the event. To satisfy the parallel trend assumption the

pre-trends must be statistically insignificant and should be reasonably flat(Schmidheiny & Siegloch, 2019). Although Malani and Reif (2015) illustrated that non-flat pre-trends can be caused by an anticipation effect rather than unobserved confounders. Even if the result corroborates the parallel trend assumption, the research design would still be invalid if local shocks systematically affected bitcoin trading volume around the treatment time. We follow the same fixed effect structure as in Equation (1), including a currency fixed effect θ_i and month-year fixed effect γ_t. Our standard errors are cluster-robust, with clustering at the currency level. The error term is denoted by ϵ_{it}.

5 Results & Analysis

In this section we will present graphical and regression-based evidence on the impact of the two events described in section 4 separately. First, we present the results from investigating the event PostFATCA. Second, we present the result from investigating the event PostBiden.

5.1 Average effect & dynamic response to FATCA

We first estimate the average effects of FATCA on bitcoin trading volume using Equation (1). The $Event_i$ variable in this equation represents a one post-period dummy marking the period after the endorsement of FATCA. The result is depicted in Table 2.

Table 2

Effect of FATCA on bitcoin trading volume

	Dependent variable: log(Volume)					
	(1)	(2)	(3)	(4)	(5)	(6)
PostFATCA*USD	0.352	0.050	-0.345			
	(1.172)	(1.145)	(1.129)			
PostFATCA*GBP				3.225**	2.932**	2.173
				(1.172)	(1.145)	(1.129)
Observations	91	126	217	91	126	217
R-squared	0.738	0.778	0.826	0.656	0.705	0.757
Currency FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Clustering	Currency	Currency	Currency	Currency	Currency	Currency

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 *Notes:* The table reports the DiD estimates. The dependent variable is the log of bitcoin trading volume with fiat currency i in month t. The table show estimates under three different sample periods. Column 1 and 4 has a sample period from August 2011 to August 2012; Column 2 and 5 has a sample period from August 2011 to February 2013; Column 3 and 6 has a sample period from August 2011 to February 2014. All sample periods are balanced. PostFATCA is an indicator variable for all periods after the endorsement of FATCA. We control for currency fixed effects and time fixed effects. The standard errors are cluster robust with clustering at the currency level.

In Table 2, the $Currency_i$ variable in Equation (1) is a dummy variable that takes on a value of 1 for bitcoin trading volume with U.S. dollar (Columns 1 to 3) and British pound (Column 4 to 6). In Subsection 5.1.1 we interpret the result from Columns 1, 2 and 3, while in 5.1.2 we interpret the result from Columns 4, 5 and 6. Each subsection also includes the corresponding event study.

5.1.1 Effect of FATCA on bitcoin trading volume with U.S. dollar

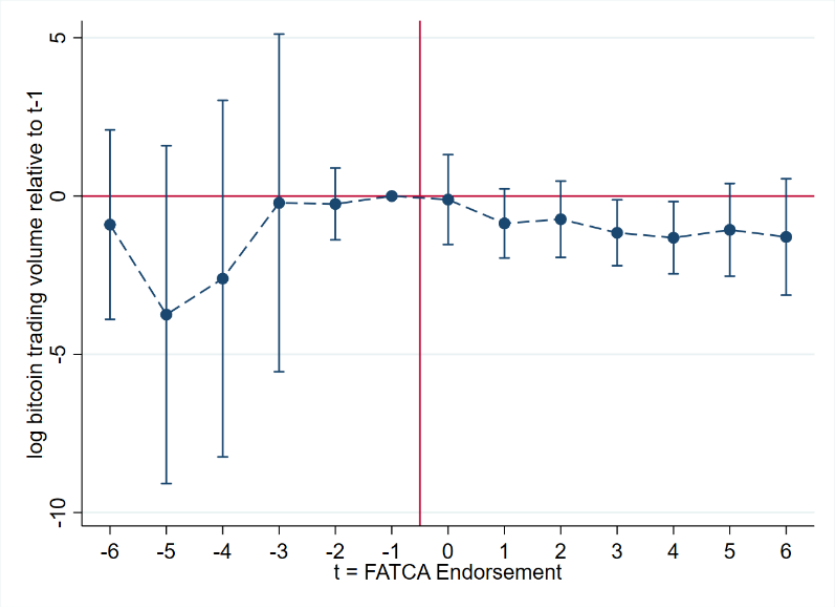
To estimate the average effect of FATCA on bitcoin trading with U.S. dollar we use Equation (1). The variable of interest is the interaction term $Event_i * Currency_i$. The $Event_i$ variable is a one post-period dummy marking the period after FATCA was endorsed. The indicator variable $Currency_i$ takes on a value of 1 for bitcoin trading volume with U.S. dollar and takes a value of 0 for trading volume in our control currencies. The effect is read from the coefficient to this interaction term β_1. In column 1 to 3 of Table 2 we report the results.

We observe a coefficient of 0.352, a 42% increase in bitcoin trading volume with U.S. dollar $PostFATCA$ compared to the change in bitcoin trading volume in the control currencies (Column 1 Table 2). We cannot reject the null hypothesis. Columns 2 and 3 show the result when increasing the post-period to February 2013 and February 2014 respectively. When extending the post-period, we observe a 5.12% increase in bitcoin trading volume with U.S. dollar after FATCA compared to the change in bitcoin trading volume in the control currencies (Column 2 Table 2). In Column 3 of Table 2 we observe a 29% decrease in bitcoin trading volume with U.S. dollar compared to the change in bitcoin trading volume with U.S. dollar compared to the change in bitcoin trading volume in the control currencies. Both results are statistically insignificant.

We conduct an event study analysis of the sample period used in Column 1 of Table 2, we report the graphical result following Equation (2) in Figure 1.

Figure 1

Event study test of reaction to FATCA endorsement in U.S. dollar



Notes: The result is from estimating Equation (1), with $\bar{j} = 6$ and $\underline{j} = -6$. The depicted coefficients show the interaction of the currency indicator with 12 separate indicator variables, each marking one month over the sample period relative to the month before the FATCA event date ($t = 0$). The omitted the indicator for period $t - 1$ serves as a benchmark and has a coefficient value of zero with no confidence interval. The plotted coefficients are shown together with their 95% confidence intervals. We use a balanced sample and the log of bitcoin trading volume as the dependent variable. As shown in Equation 1 we include time fixed effects as well as a time-invariant fixed effect and we cluster at the currency level.

We plot the coefficients (β_j), each of which marks the change in bitcoin trading volume denoted in USD versus the control group around the PostFATCA date (in event time). We omit the indicator for period ($t - 1$), thereby expressing the change relative to the month before the FATCA treatment event date ($t = 0$). The effect window is limited to 6 periods ($\bar{j}$) after and 6 periods ($|\underline{j}|$) before the event. Because the coefficients are near to zero and statistically nonsignificant in the pretreatment period, the findings support the parallel trend hypothesis. In Column 1 in Table 2 we observed a 42% increase in bitcoin trading volume with U.S. dollar PostFATCA compared to the change in bitcoin trading volume in the control group. By using

event study, we can see the dynamic reaction. First, we observe that there is no immediate reaction in period $t = 0$. Second, we observe a decrease in bitcoin trading volume with U.S. dollar compared to the control currencies when expressed relative to the benchmark. The posttreatment period shows a small increase in effect size but stays relatively stable from $t = 1$ to $t = 6$. The average increase we observe in Column 1 Table 2 is likely due to the pre-trend in period $t = -4$, $t = -5$ and $t = -6$ diverging from zero.

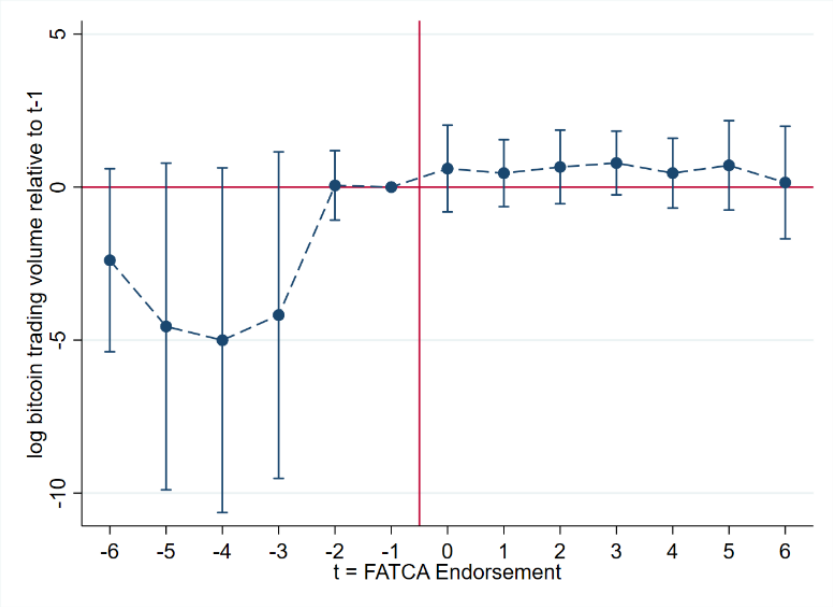
5.1.2 Effect of FATCA on bitcoin trading volume in British pound

To estimate the average effect of FATCA on bitcoin trading volume with British pound we use Equation (1). The interaction term $Event_i * Currency_i$ is the variable of interest. The variable $Event_i$ is a one post-period dummy marking the period after FATCA was endorsed. The binary variable, $Currency_i$, takes on a value of 1 for all bitcoin trading volume with British pound and 0 for the control currencies in our sample. The effect is read from the coefficient to this interaction term, β_1. In Column 4 to 6 of Table 2 we report the results.

We observe a coefficient of 3.225, a 2415% increase in bitcoin trading volume with U.S. dollar $PostFATCA$ compared to the change in bitcoin trading volume in the control currencies (Column 4 Table 2). The result is statistically significant at the 1% level. Columns 4 and 5 show the result when increasing the post-period to February 2013 and February 2014 respectively. When extending the post-period we observe we observe a 1776% increase in bitcoin trading volume with British pound $PostFATCA$ compared to the change in bitcoin trading volume in our control group (Column 5 Table 2). The result is significant at the 1% level. In Column 6 of Table 2 the results is nonsignificant, likely due to CRS affecting our control group. We conduct an event study test of the sample period used in Column 4 of Table 2. The specification follows Equation (2), we show the graphical result from this test in Figure 2.

Figure 2

Event study test of reaction to FATCA endorsement in British pound



Notes: Each of the coefficients in the graph represents a change in trading volume in GBP compared to the control group currencies around the PostFATCA date (in event time). We estimate Equation 1. The depicted coefficients show the interaction of the currency indicator with 12 separate indicator variables, each marking one month over the sample period relative to the month before the FATCA event date (t=0). We bin the treatment indicators before t-6 and after t+6 and omit the indicator for period t-1, which therefore serves as a benchmark and has a coefficient value of zero with no confidence interval. The coefficient estimates is plotted together with their 95% confidence intervals. We use a balanced sample and the log of bitcoin trade volume as the dependent variable. As shown in Equation 1 we include time fixed effects as well as a time-invariant fixed effect and we cluster at the currency level.

We plot the coefficients (β_j), each of which marks the change in bitcoin trading volume denoted in USD versus the control group around the PostFATCA date (in event time). We omit the indicator for period $(t-1)$, thereby expressing the change relative to the month before the FATCA treatment event date $(t=0)$. The effect window is limited to 6 periods $(\bar{j})$ after and 6 periods $(\underline{|j|})$ before the event. Coefficients in the pretreatment period is statistically non-significant, supporting the parallel trend hypothesis. In the posttreatment period, the effect is bigger directly following the event date and stays relatively stable over time until period $t+6$.

The immediate reaction and the following stable increase suggest that people reacting to FATCA is evenly distributed in the following months. Next, we see that the large average effect observed in Column 4 of Table 2 is likely overstated and might be caused by the pre-trends observed in $t = -3$ to $t = -6$.

5.2 Average effect & dynamic response to the Biden budget proposal

We estimate the average effects of the Biden budget proposal on bitcoin trading volume using Equation (1). The $Event_i$ variable in this equation represents a one post-period dummy marking the period after the Biden budget proposal. The result is depicted in Table 3.

Table 3

Effect of Biden budget proposal on bitcoin trading volume

	Dependent variable: log(Volume)			
	(1)	(2)	(3)	(4)
PostBiden*USD	0.263	0.661**		
	(0.262)	(0.258)		
PostBiden*GBP			-0.263	-0.144
			(0.262)	(0.258)
Observations	112	133	112	133
R-squared	0.981	0.893	0.971	0.853
Currency FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Clustering	Currency	Currency	Currency	Currency

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 *Notes:* The table reports the DiD estimates. The dependent variable is the log of bitcoin trading volume with fiat currency i in month t. The table show estimates under two different sample periods. Column 1 and 3 has a sample period from November 2019; Column 2 and 4 has a sample period from June 2019 to January 2022. Both sample periods are balanced. PostBiden is an indicator variable for all periods after the Biden budget proposal. We control for currency fixed effects and time fixed effects. The standard errors are cluster robust with clustering at the currency level.

In Table 3, the $Currency_i$ variable in Equation (1) is a dummy variable that takes on a value of

1 for bitcoin trading volume denoted in U.S. dollar (Columns 1 and 3) and British pound (Column 4 and 6). In Subsection 5.2.1 we interpret the result from Columns 1 and 2, while in 5.2.2 we interpret the result from Columns 4 and 5. Each of these subsections also show results from the event study.

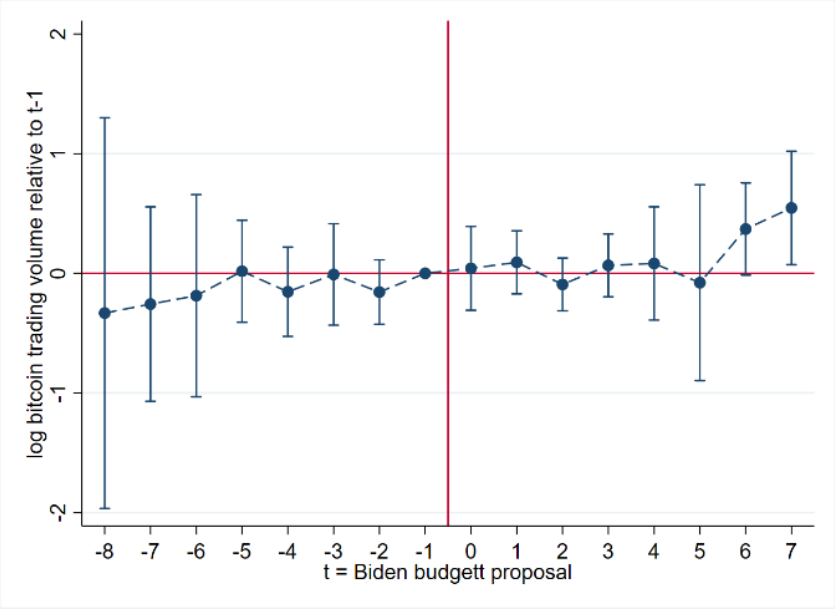
5.2.1 Effect of PostBiden on bitcoin trading volume in U.S. dollar

To estimate the average effect of the Biden budget proposal on bitcoin trading volume with USD we use Equation (1). The variable of interest is the interaction term $Event_i * Currency_i$. The $Event_i$ variable is one post-period dummy marking the period after the Biden budget proposal. The binary $Currency_i$ variable is equal to one for trading volume with U.S. dollar and 0 for trading volume in our control currencies. The effect is read from the coefficient to the interaction term β_1. In Column 1 to 4 of Table 3 we report the result.

We observe a coefficient of 0.263, a 30% increase in bitcoin trading volume with U.S. dollar compared to the change in bitcoin trading volume in our control group (Column 2 Table 3). The result is nonsignificant. Column 2 show the result when increasing the pretreatment period, we observe a 94% increase in bitcoin trading volume with U.S. dollar $PostBiden$ compared to the change in bitcoin trading volume in our control group (Column 2 Table 3). The result is significant at the 5% level. We conduct an event study analysis of the sample period used in Column 1 of Table 3, we report the graphical result following Equation (2) in Figure 3.

Figure 3

Event study test of reaction to Biden budget proposal in USD



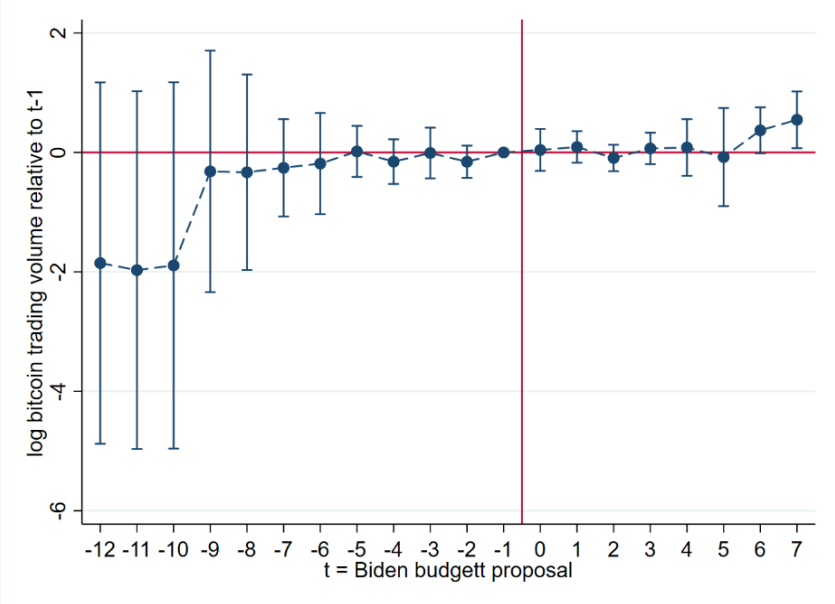
Notes: The result is from estimating Equation (1), with $\bar{j} = 7$ and $\underline{j} = -8$. The depicted coefficients show the interaction of the currency indicator with 15 separate indicator variables, each marking one month over the sample period relative to the month before the FATCA event date ($t = 0$). The omitted the indicator for period $t - 1$ serves as a benchmark and has a coefficient value of zero with no confidence interval. The plotted coefficients are shown together with their 95% confidence intervals. We use a balanced sample and the log of bitcoin trading volume as the dependent variable. As shown in Equation (2) we include time fixed effects as well as a time-invariant fixed effect and we cluster at the currency level.

We plot the coefficients (β_j), each of which marks the change in bitcoin trading volume denoted in USD versus the control group around the PostFATCA date (in event time). We omit the indicator for period $(t - 1)$, thereby expressing the change relative to the month before the PostBiden treatment event date ($t = 0$). The effect window is limited to 7 periods ($\bar{j}$) after and 8 periods ($|\underline{j}|$) before the event. The results of the event study, as shown in Figure 3, corroborate the parallel trend assumption because the coefficients lie close to zero and are nonsignificant in the pretreatment period. In the posttreatment period, we see that there is no immediate reaction, the coefficients are near to zero and has no one-directional effect. However, in period $t + 6$ we observe an increase, and the coefficient size increases from period $t = 5$ to $t = 6$. The increase can be indicative of individuals reacting late to the budget proposal. However, as we saw in

Column 1 Table 3 the average increase of 30% in bitcoin trading volume denoted in USD compared to the change in volume in our control group is non-significant. To further investigate the significant result in Column 2 of Table 3 we also include an event study of this period in Figure 4 below.

Figure 4

Event study test of reaction to Biden budget proposal in USD



Notes: The result is from estimating Equation (1), with $\bar{j} = 7$ and $\underline{j} = -12$. The depicted coefficients show the interaction of the currency indicator with 19 separate indicator variables, each marking one month over the sample period relative to the month before the FATCA event date $(t = 0)$. The omitted the indicator for period $t - 1$ serves as a benchmark and has a coefficient value of zero with no confidence interval. The plotted coefficients are shown together with their 95% confidence intervals. We use a balanced sample and the log of bitcoin trading volume as the dependent variable. As shown in Equation (2) we include time fixed effects as well as a time-invariant fixed effect and we cluster at the currency level.

We plot the coefficients (β_j), each of which marks the change in bitcoin trading volume denoted in USD versus the control group around the PostFATCA date (in event time). We omit the indicator for period $(t - 1)$, thereby expressing the change relative to the month before the

PostBiden treatment event date ($t = 0$). The effect window is limited to 7 periods ($\bar{j}$) after and 12 periods ($\underline{|j|}$) before the event. The result is comparable to that seen in Figure 3. The coefficients in the pretreatment period, however, deviate more significantly from zero, though they are still insignificant. The significant increase observed in Column 2 of Table 3 is likely owing to the fact that the pre-period coefficients $t - 10$ to $t - 12$ diverge more significantly from zero than when using a smaller pretreatment period as seen in Figure 3.

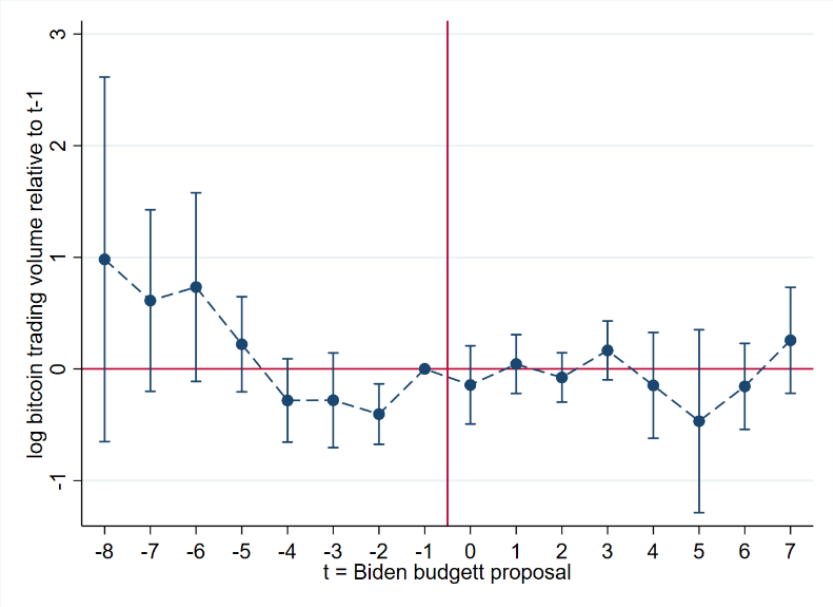
5.2.2 Effect of PostBiden on bitcoin trading volume in British pound

To estimate the average effect of the Biden budget proposal on bitcoin trading volume with British pound we use Equation (1). The variable of interest is the interaction term $Event_i * Currency_i$. The $Event_i$ variable is one post-period dummy marking the period after the Biden budget proposal and the $Currency_i$ variable is equal to 1 for all trading volume with British pound. The result is shown in Column 4 and 5 in Table 3.

We observe a 23% decrease in bitcoin trading volume PostBiden compared to the currencies in our control group (Column 4 Table 3). The result is nonsignificant. When increasing the posttreatment period, we observe a 13% decrease in bitcoin trading volume compared to the change in trading volume in the control currencies (Column 5 Table 3) The result is nonsignificant. We conduct an event study analysis of the sample period used in Column 3 of Table 3, we report the graphical result following Equation (2) in Figure 3.

Figure 5

Event study of reaction to Biden budget proposal with British pound



Notes: The result is from estimating Equation (1), with $\bar{j} = 7$ and $\underline{j} = -8$. The depicted coefficients show the interaction of the currency indicator with 15 separate indicator variables, each marking one month over the sample period relative to the month before the FATCA event date $(t = 0)$. The omitted the indicator for period $t - 1$ serves as a benchmark and has a coefficient value of zero with no confidence interval. The plotted coefficients are shown together with their 95% confidence intervals. We use a balanced sample and the log of bitcoin trading volume as the dependent variable. As shown in Equation (2) we include time fixed effects as well as a time-invariant fixed effect and we cluster at the currency level.

We plot the coefficients (β_j), each of which marks the change in bitcoin trading volume denoted in USD versus the control group around the PostFATCA date (in event time). We omit the indicator for period $(t - 1)$, thereby expressing the change relative to the month before the PostBiden treatment event date $(t = 0)$. The effect window is limited to 7 periods $(\bar{j})$ after and 8 periods $(|\underline{j}|)$ before the event. The result, as shown in Figure 5 show significant coefficient in the pretreatment period, significant pre-trends violate the common trend assumption. Violation of parallel trend assumption will lead to biased estimation of the causal effect. As a sidenote we can also see no one-directional nature of the effect in the posttreatment period. The nature of the Biden

budget proposal, as explained in section 3 is that it would only affect American based cryptocurrency exchanges. Logically one can assume that U.S. persons involved in tax evasion, using foreign currency to trade in bitcoin will not use American based exchanges. The result from the DiD estimator as well as the event study corroborates this assumption.

6 Discussion & limitations

The results can be summarized as follows. Bitcoin trading volume increased by 43% following the endorsement of FATCA, albeit the average effect is likely overstated as gleaned from the event study and the result is nonsignificant. We use to additional models, increasing the post-treatment period to 12 and 24 months. The effect is lower and even changes direction, likely caused by confounding factors (the anticipation and implementation of CRS). The more interesting effect was on bitcoin trading volume with British pound, we document a 2415% statistically significant short-term increase after the endorsement of FATCA. The result is likely overstated as shown in the event study but we argue that this constitutes indirect evidence showing U.S. based taxpayers avoiding the information exchange under FATCA.

The second event we looked at was the Biden budget proposal. Bitcoin trading volume with U.S. dollar increased by 30 and 94%, depending on the pretreatment period. The change in bitcoin trading volume with British pound was nonsignificant and also violated the parallel trend assumption. This is consistent with expectations, the Biden budget proposal would only affect U.S. based exchanges, we would not expect U.S. based taxpayers using offshore tax havens to react to legislations affecting only U.S. based cryptocurrency exchanges. The result is lower bound.

6.1 Limitations of study

We have identified the following limitations of our study and available data. The first set of limitations relate to the data and following analysis. We calculate cluster-robust standard errors to permit heteroskedasticity and within-cluster error correlation. However, with the small number of clusters that we have the standard asymptotic test can over-reject (Cameron et al., 2008). Next, we have corroborating evidence supporting parallel pretends (with one exception), although some of the pre-trends should optimally be closer to zero and can overestimate the average effect. Furthermore, our identification strategy use currency as a proxy for country of origin, assuming tax evaders keep to their home-currency or trade in currencies that belong to tax havens. Arguably

one would some spillover to other currencies and vice versa. We therefore have to be careful to assume causality.

7 Conclusion

In this study, we analyze the short-term impact of the endorsement of FATCA on bitcoin trading volume. Thereby aiming to verify if cryptocurrencies is being used to avoid the AEOI regimes, designed to combat offshore tax evasion. We have taken steps when developing the empirical analysis as to minimize potential confounding factors. First, we use a difference-in-difference method, a well-established model used for research into AEOI regimes. Second, we use an event study to evaluate the key identifying assumption, namely the common trend assumption. Third, we limit the period to avoid other major events that might influence our model. Lastly, we implement the most demanding fixed effect structure that the data allows. We apply similar methodology as used in Casi et al. (2020), applied to a vastly different dataset.

We document a statistically significant increase in bitcoin trading volume with British pound after the endorsement of FATCA. We argue that this is indirect evidence showing U.S. based taxpayers avoiding the information exchange under FATCA. For bitcoin trading volume with U.S. dollar the result was nonsignificant. Next, we document an increase in U.S. dollar as a reaction to the Biden budget proposal (significant at 5% level), the event study show a late reaction.

Our contribution to the literature is twofold. First, we add to the taxation literature, more specifically it adds to the empirical studies on the AEOI regimes. Second, we shed light on tax-motivated trading in the cryptocurrency market.

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