GOVERNMENTAL RESPONSE TO BITCOIN:

WHY CRYPTOCURRENCY REGULATION

DIFFERS ACROSS THE WORLD

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Submitted to
Central European University
Department of International Relations

In partial fulfilment of the requirements for the degree of Master of Arts in International Relations

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Budapest, Hungary
2020

Word Count: 10,214

Abstract

Currently, there is no single approach to regulating cryptocurrencies in the world. The study of factors that could explain this is underdeveloped. Limited research, though, shows that cryptocurrencies are less regulated in economies with sophisticated legislation. In contrast to existing work, which does not differentiate between the hands-off approach of governments and permissive regulation, I argue that democracies with the developed legislature are less likely to ban cryptocurrencies but, at the same time, are more likely to apply permissive regulation to them. I also assume that factors, that matter in cryptocurrency adoption, may influence how governments respond to cryptocurrencies.

This thesis answers the question of why cryptocurrency regulation differs across the world by examining the relationship between governmental response to cryptocurrencies, on the one hand, and the level of democracy and factors that matter in cryptocurrency adoption, such as corruption, inflation, and dependence on remittances, on the other hand. My main method of estimation is a cross-sectional ordered logit regression using data from Polity data series, World Bank database, and Transparency International. To measure the governmental response to cryptocurrencies, I create an index of 172 economies using the information on cryptocurrency legal and regulatory status available as of 2018, thus, my research does not capture regulatory changes over time. The results confirm my hypothesis regarding democracies. However, I find no evidence that adoption-related variables influence governmental response to cryptocurrencies. This paper places cryptocurrencies into the international political economy agenda and contributes to the emerging literature on drivers of cryptocurrency regulation.

Acknowledgements

This thesis has been quite a challenge, and it would not be born if not for all the people who have encouraged, supported, and assisted me. It was meant to be written in New York during the BGIA semester, but circumstances made it impossible. I am thanking CEU Department of International Relations for helping me and all my classmates safely get back home from New York and supporting us through all the challenges of the pandemic.

I am thanking my supervisor, professor Andrew Xiang Li, for guiding me through a year-long process of working on the thesis since I first came up with the idea and until the final draft. I am also thanking my supervisor for making my experience of quantitative research smooth and simple, despite that never before had I conducted research of this kind.

I am thanking Kairat Umargaliyev and Flora Rencz for being my informal statistics teachers and for always advising on how to deal with regressions and STATA. I am thanking all my friends and acquaintances who assisted me with country-specific research. Without Jorge Antonio Chavez Mazuelos, Rodrigo Sanchez, Emma Bihan-Poudec, Burcu Kısaç, Ibrahim Yusuf Bangura, Melody Rachel Frempong, and Nasrat Khalid I would not have been able to make the index of governmental response to cryptocurrencies as broad as it turned out to be.

I am thanking my friend Shoeb Haque for believing in me and pushing me start the thesis despite self-doubt and fears. I am also thanking Kossi B. Atchrimi and Tamás Farbaky for moral support and thesis-related discussions throughout the process. I am thanking my Slovak brother Lukáš Dravecký for being my 'thesis buddy' and sharing all the struggles of the research and writing, especially in the last weeks before submission.

Most importantly, I am thanking my parents, who created comfortable conditions for me to complete this work in unprecedented times.

Finally, I am thanking all people who doubted the idea and feasibility of this thesis. This helped me to be more persistent and resilient.

Table of Contents

List of Tables

List of Abbreviations

Altcoins – alternative coins

CBDC – Central bank digital currencies

ICOs – Initial coin offerings

VCs – virtual currencies

Introduction

Once Facebook announced a possible launch of its cryptocurrency Libra, regulators and lawmakers around the world upped scrutiny amid concerns that such a venture could destabilize the traditional financial system.[1] Indeed, no other private giant of Facebook's scope had previously stepped up to propose a private currency to function on par with national fiat money in the central banks-dominated world. A move to embrace Libra would give a green light to new projects of this kind as well as reaffirm the legitimacy of the already existing cryptocurrencies like Bitcoin, Ethereum, and XRP. The latter, however, for long have been spurring regulatory debates and concerns – perhaps even before Facebook's leadership came up with the idea of Libra.

Bitcoin and alternative cryptocurrencies (hereafter – altcoins) emerged in the absence of effective regulation, which allowed users to avail themselves of low transaction fees and low processing time. At the same time, it allowed actors with malicious intentions to use cryptocurrencies for money laundering, tax evasion, terrorism financing, and so on. Combining features of currencies, commodities, and payment systems, cryptocurrencies made it challenging for lawmakers to define and regulate them.[2] Today, there is no single approach to regulating cryptocurrencies. The Global Research Centre's[3] and Baker McKenzie's[4] reports on cryptocurrency regulation all over the world are great evidence of that.

While some countries have embraced the use of cryptocurrencies (e.g. Canada, Japan, South Africa, and Belarus), others have directly or implicitly banned them (e.g. China, Libya, Pakistan, and Kuwait). Many applied the hands-off approach, merely warning users of potential risks of cryptocurrency use but not creating new or adjusting the existing laws to them. A

[1] Browne, 'Here's Why Regulators Are So Worried about Facebook's Digital Currency'.
[2] He et al., 'Virtual Currencies and Beyond', 24.
[3] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World'.
[4] Baker McKenzie, 'Blockchain and Cryptocurrency in Africa'.

smaller range of countries have gone further – they have created or started working on their own cryptocurrencies or central bank digital currencies (hereafter – CBDC) in response to the adoption of Bitcoin and altcoins (Venezuela, China, Ireland, Sweden).[5]

In 2015, Hileman[6] and Darlington[7] identified factors that would determine the future of cryptocurrency adoption, namely, hyperinflation, countries' dependence on remittances, and high level of corruption. Both authors concluded that cryptocurrencies have the greatest potential in underdeveloped countries with struggling economies, particularly, in Argentina and Sub-Saharan Africa. However, currently, cryptocurrencies seem to reside in developed tech-savvy economies.[8] Why is this so? Why do not governments of developing states embrace cryptocurrencies if they have the potential to enhance their economies, for instance, through an inflow of 'rebittances' (remittances sent in cryptocurrencies)?[9] Why do countries all over the world respond to cryptocurrencies in different ways? What are the factors that determine a certain approach that governments undertake in regulating cryptocurrencies?

The existing literature does not provide a clear answer to these questions. In fact, very few studies have been dedicated to the factors influencing governmental response to Bitcoin and its brethren. In 2014, Spenkelink conducted a structured literature review on 38 articles about cryptocurrency, which showed that most articles explain cryptocurrencies and, specifically, Bitcoin protocol. Thus, most topics discussed were technical. Only three of the selected articles focused on the economic aspects of cryptocurrencies and two were related to cryptocurrency regulation.[10] Nowadays the array of cryptocurrency-focused fields of study is much wider and, besides technical aspects of Bitcoin and blockchain, it includes more research

[5] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World', 6.
[6] Hileman, 'The Bitcoin Market Potential Index'.
[7] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis'.
[8] Darlington III, 6.
[9] Scott, 'How Can Cryptocurrency and Blockchain Technology Play a Role in Building Social and Solidarity Finance?'
[10] Spenkelink, 'The Adoption Process of Cryptocurrencies', 4–7.

on the historical background of cryptocurrency (Ammous[11] and Fletcher[12] link Bitcoin to the denationalized money that Hayek envisioned[13]), its impact on the economic development[14] and social finance[15], as well as extended research on cryptocurrency adoption and regulation. While several scholars have dedicated their research to the factors that influence cryptocurrency adoption (Sobhanifard and Sadatfarizani[16], Vlachos et al.[17], Darlington[18]), cryptocurrency regulation literature has been addressing predominantly issues within the legal field (Bollen[19], Doguet[20], Guadamuz and Marsden[21]). Little research has been done in the direction of placing cryptocurrencies in the international political economy agenda. One of the few pieces of research which investigated factors influencing specifically cryptocurrency regulation is by Shirakawa and Korwatanasakul. The authors examined the relationship between states' openness to cryptocurrencies and financial development via financial openness and legal institutions and found that the latter and not the former determine states' openness to cryptocurrencies. Yet, the authors failed to distinguish the hands-off approach from the permissive regulation of cryptocurrencies, as they claimed in their piece.[22]

This thesis contributes to the emerging literature on factors influencing governmental response to cryptocurrencies. It is crucial as currently there is no indication in which direction the regulation of cryptocurrencies will go.[23] Since cryptocurrencies have potential to combat

[11] Ammous, 'Economics Beyond Financial Intermediation'.
[12] Fletcher, 'Currency in Transition: An Ethnographic Inquiry of Bitcoin Adherents'.
[13] Hayek, *Denationalisation of Money*.
[14] Kshetri, 'Will Blockchain Emerge as a Tool to Break the Poverty Chain in the Global South?'
[15] Scott, 'How Can Cryptocurrency and Blockchain Technology Play a Role in Building Social and Solidarity Finance?'
[16] Sobhanifard and Sadatfarizani, 'Consumer-Based Modeling and Ranking of the Consumption Factors of Cryptocurrencies'.
[17] Vlachos, Christodoulou, and Iosif, 'An Algorithmic Blockchain Readiness Index'.
[18] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis'.
[19] Bollen, 'The Legal Status of Online Currencies: Are Bitcoins the Future?'
[20] Doguet, 'The Nature of the Form: Legal and Regulatory Issues Surrounding the Bitcoin Digital Currency System'.
[21] Guadamuz and Marsden, 'Blockchains and Bitcoin: Regulatory Responses to Cryptocurrencies'.
[22] Shirakawa and Korwatanasakul, 'Cryptocurrency Regulations: Institutions and Financial Openness', 1.
[23] Spenkelink, 'The Adoption Process of Cryptocurrencies', 49.

poverty[24] and bring solutions to developing economies,[25] for example, by transforming the remittance industry,[26] and since the permissive regulation may influence wider adoption of cryptocurrencies,[27] understanding what underpins government regulatory choices can show if governments themselves are aware of the innovative opportunities of cryptocurrencies[28] and if they are willing to endorse them. Also, it can show if governments intend to maintain the monetary power in their hands or let decentralized and global currencies flourish.

There is strong evidence from previous theoretical and empirical findings that high levels of democracy[29] and country's dependence on remittances[30] are positively associated with countries' financial openness, while high levels of corruption[31] and inflation[32] happen to influence stricter capital controls. Based on this, I argue that democracy and remittances are likely to be associated with the permissive regulation of cryptocurrencies, whereas high levels of corruption and inflation might be associated with cryptocurrencies prohibition.

To start the empirical investigation, I created an index of governmental response to cryptocurrencies – cryptocurrency regulation status in 2018, based on information from reports and data, compiled by the Global Research Centre,[33] Baker McKenzie,[34] Trading Education,[35] as well as from official central bank statements and reports in the media on selected countries.[36] I have identified three extensive ways in which governments can respond to cryptocurrencies in 172 economies – ban, recognize, or stay neutral to them.

[24] Brito and Castillo, 'Bitcoin: A Primer for Policymakers', 14.
[25] Clegg, 'Could Bitcoin Be A Financial Solution for Developing Economies?'
[26] Parsons, 'Bitcoin – Sending Money Home'.
[27] Spenkelink, 'The Adoption Process of Cryptocurrencies', 57.
[28] Marian, 'A Conceptual Framework for the Regulation of Cryptocurrencies', 53.
[29] Dailami, 'Financial Openness, Democracy, and Redistributive Policy', 25.
[30] Beine, Lodigiani, and Vermeulen, 'Remittances and Financial Openness'.
[31] Dreher and Siemers, 'The Nexus between Corruption and Capital Account Restrictions', 257.
[32] Grilli and Milesi-Ferretti, 'Economic Effects and Structural Determinants of Capital Controls', 517.
[33] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World'.
[34] Baker McKenzie, 'Blockchain and Cryptocurrency in Africa'.
[35] Trading Education, 'Cryptocurrency Regulation Around the World in 2019 Ranked.'
[36] Find more about this in the methodology section.

Since developed jurisdictions are likely to create regimes for protecting consumers,[37] I include the level of democracy as one of the main independent variables, although it is not related to cryptocurrency adoption. Referring to Hileman's Bitcoin's Market Potential Index,[38] Darlington's profile of a country primed to adopt cryptocurrencies,[39] and Chinn and Ito's rationale for considering macroeconomic factors[40], I establish the following independent variables: inflation rate, countries' dependence on remittances, and level of corruption. As a control variable, I include GDP per capita. Using a cross-sectional ordered logit model, I examine the relationship between governmental response to cryptocurrencies on the one side and political and developmental factors on the other.

My results demonstrate that higher levels of democracy are strongly associated with a lower likelihood of cryptocurrency prohibition. In the meantime, macroeconomic and related factors have not been found significant. As there is no evidence that country's level of development, inflation, corruption, or dependence on remittances may influence which stance the government will take on cryptocurrencies, it may imply that governments are not driven in their decisions to regulate cryptocurrencies by factors which are likely to increase users' adoption of cryptocurrencies. Instead, governmental response to Bitcoin and its brethren might be determined by regulatory practices that are common in certain political systems.[41]

This thesis proceeds in the following chapters. Chapter 1 reviews literature on what cryptocurrencies such as Bitcoin are, why users adopt them, and how state actors have been reacting to this. Chapter 2 discusses the links between governmental regulatory response to cryptocurrencies and independent variables. Chapter 3 explains the methodological choices and describes the data. This chapter also provides an overview of how I compiled the index of

[37] Bollen, 'The Legal Status of Online Currencies: Are Bitcoins the Future?', 20.
[38] Hileman, 'The Bitcoin Market Potential Index'.
[39] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis'.
[40] Chinn and Ito, 'What Matters for Financial Development? Capital Controls, Institutions, and Interactions.'
[41] Lipsky, 'Rulemaking as a Tool of Democracy. Reclaiming the Debate on Regulation', 31.

governmental response to cryptocurrency, how and why it is distinct from indexes that have been created before. Chapter 4 presents empirical results and related discussion. The last chapter concludes and provides suggestions for further research of cryptocurrencies in the field of international political economy.

Chapter 1. Literature Review: Cryptocurrencies, Their Adoption and Regulation

In this chapter, I will summarise and evaluate studies on cryptocurrencies, their adoption and regulation, as well as identify gaps in the existing literature which I aim to address in this thesis.

1.1. Is Bitcoin that novel? Retrospective on Non-National Currencies, and Present Debates

In the wake of the 2008 crisis, as the global financial system once again unveiled its weaknesses, an outwardly novel type of currency was introduced – Bitcoin. An enigmatic programmer (or a group of them) named Satoshi Nakamoto published a white paper of Bitcoin, stating that the current system, although working fine with most of the transactions, "still suffers from the inherent weaknesses of the trust-based model".[42] The new "electronic cash system", as Satoshi Nakamoto described Bitcoin, paved the way for similar systems – altcoins, and also stirred hype.[43] Today, there are over 2,500 cryptocurrencies listed on Coinmarketcap.com.[44] Named as crypto-, digital, virtual currencies, commodities, assets, or tokens across jurisdictions and in academic literature,[45] they have been viewed as an alternative monetary system which might or might not seriously disrupt the existing system with its novelty.[46]

The idea of electronic currency, however, is not new and dates back to the 1980s.[47] In the 1990s, it was also predicted that the Internet would lead to the establishment of new money.[48] Mayer-Schönberger and Crowley even argued that it is national regulation which

[42] Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System', 1.
[43] Farell, 'An Analysis of the Cryptocurrency Industry', 11.
[44] Coinmarketcap.com, 'Cryptocurrency Market Capitalizations'.
[45] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World', 1.
[46] Weber, 'Can Bitcoin Compete with Money?', 1.
[47] Farell, 'An Analysis of the Cryptocurrency Industry', 5.
[48] Plassaras, 'Regulating Digital Currencies: Bringing Bitcoin within the Reach of the IMF', 379.

would increase rivalry between virtual world providers and drive the world towards "a decentralized peer-to-peer model",[49] what actually happens to be Bitcoin today. Yet, should we put aside the technological aspect of cryptocurrencies, it will become clear that Bitcoin and altcoins are not as novel as one could have assumed. The idea of denationalized money (cryptocurrencies are not issued by any state and are indeed cosmopolitan) is reflected in 1974 work by Hayek. The author argued that if not for state actors, private enterprises would long ago have provided people with an array of private currencies.[50] Hayek, however, did not predict that a currency without a private enterprise as an issuer could come into this world and circumvent central bank monopoly.

Chang emphasizes that currently there is no such a thing as regulation-free zone or legal vacuum for cryptocurrencies.[51] However, when Bitcoin emerged, there barely was effective regulation targeting cryptocurrencies specifically, if any regulation at all. This resembles the times preceding the spread of territorial (also national) currencies in the nineteenth century. Before central banks took monetary policy control in their hands, private money was freely circulating on the market. There were two types of them, according to Helleiner,[52] – currencies issued by foreign states (foreign currencies) and those issued by private persons (low denomination money). Cryptocurrencies have common traits with both foreign and low denomination money: they are used on par with national currencies (although in a limited way), they are yet far from widespread circulation, the vast majority of them are not issued by central banks, they are cosmopolitan, they are not easily converted into national currencies, their value is uncertain, etc. When foreign and low denomination currencies emerged, there was no

[49] Mayer-Schöenberger and Crowley, 'Napster's Second Life?', 1780.
[50] Hayek, *Denationalisation of Money*, 14.
[51] Chang, 'Legal Status of Cryptocurrency in Indonesia and Legal Analysis of the Business Activities in Terms of Cryptocurrency', 90.
[52] Helleiner, 'The Making of National Money: Territorial Currencies in Historical Perspective / Eric Helleiner', 19.

regulation regarding them. This knowledge allows us to understand better how governments can respond to cryptocurrencies.

Although first central banks were established in the seventeenth century, private currencies were not removed from circulation until the nineteenth century, when central banks started losing independence from governments. States began to ban this kind of money and replacing it with national currencies.[53] Thus, the prohibition of non-state-issued currencies was the first regulation towards them. Today cryptocurrencies are directly or implicitly banned in a range of countries. However, it is the technological backing that makes Bitcoin and its brethren prone to survival, compared to private currencies of the nineteenth century. Despite the implicit ban, cryptocurrencies exchange trading volumes have continued to remain high in China,[54] and other countries as well.

The technology behind cryptocurrencies – blockchain – indeed makes them unique and creates challenges not only for regulating them but defining in the first place. Blockchain enables cryptocurrencies to have multiple uses, and from here stem various properties that cryptocurrencies have, particularly, properties of currencies, commodities, and payment systems, as explained by He.[55] This poses a challenge to lawmakers and regulators when defining cryptocurrency prior to regulating it: some countries view it as a currency, others as an asset, or a commodity or security. For sure it is known that no country has ever accepted cryptocurrency as legal tender.

The debate on whether cryptocurrency is money or not is still ongoing. Weber argues that in future Bitcoin will serve only as a speculative asset and cannot be a viable alternative to existing national currencies since it does not fulfil the three functions of money.[56] According to the author, volatility and the absence of a legal tender status prevents Bitcoin from being a unit

[53] Helleiner, 23.
[54] Lee, 'Cryptocurrency Traders in China Find Ways to Get around State Regulators despite Tighter Scrutiny'.
[55] He et al., 'Virtual Currencies and Beyond', 24.
[56] Weber, 'Can Bitcoin Compete with Money?', 2.

of account. It also cannot be seen as a medium of payment as cryptocurrencies are mostly used for trading and have limited acceptance network.[57] Weber assumes that Bitcoin may have the potential to store value, but, once again, volatility makes it questionable in the long run. By contrast, Plassaras views digital currencies (another name used for cryptocurrencies) as a potentially superior type of money. He argues that they can be a superior medium of exchange as they envision lower transaction costs. Plassaras also considers digital currencies as a superior unit of account because they could be intrinsically and intuitively valuable due to production difficulties. Finally, he says they have the potential to be a stable store of value given their decentralized nature and adherence to market forces.[58]

All this is to say that cryptocurrency regulation is not an easy task for lawmakers and regulators. In the next sections of this chapter, I will look at the literature on cryptocurrency adoption and regulation, as well as forces that may drive them.

1.2. What Drives Cryptocurrency Adoption

Cryptocurrency adoption, as defined by Hileman, is "utilization of bitcoin and blockchain technology for a variety of monetary and non-monetary functions".[59] By total Bitcoin software client downloads, the USA, China, Germany, and Russia lead the world in cryptocurrency adoption.[60] What does the academic literature say about this? Many scholars have dedicated their work to factors that drive or may drive cryptocurrency adoption. It is important to talk about them in this thesis as adoption may contribute to cryptocurrency regulation and vice versa. In this section, I will review the literature on cryptocurrency adoption factors and their relation to regulation.

[57] He et al., 'Virtual Currencies and Beyond', 17.
[58] Plassaras, 'Regulating Digital Currencies: Bringing Bitcoin within the Reach of the IMF', 388–90.
[59] Hileman, 'The Bitcoin Market Potential Index', 1.
[60] Sourceforge.net, 'Bitcoin Client Downloads'.

A clear direction of the relationship between cryptocurrency adoption and its regulation has not been determined yet with the help of empirical tests. However, the literature review implies that it might be a 'two-way street'. Farell argues that among factors that enhance cryptocurrency adoption are international government regulatory attempts.[61] After interviewing people with some knowledge on cryptocurrency from various fields, Spenkelink concluded that more adoption will lead to more regulation, but also admitted that regulation (depending on if it is positive or negative) will influence on adoption in different ways. In fact, the absence of any regulation will allow cryptocurrency-passionate entrepreneurs to start their own business.[62]

Regulation is just one of many other factors that may contribute to cryptocurrency adoption. Vlachos et al. propose an Algorithmic Blockchain Readiness Index, which is aimed to show if countries are ready for cryptocurrencies in particular. Its indicators include, apart from regulation, research, technology, industry, and user engagement.[63] Sobhanifard et al.'s study shows that from consumers' perspective the most influential factors for adoption are technological skills, technological ambiguity, and technological advantages, but in total 31 factors can promote cryptocurrency use.[64] Bouraoui, instead of focusing on the global Bitcoin market, focuses solely on emerging states and establishes that countries, where people have limited access to banking systems, tend to adopt cryptocurrencies more.[65]

Darlington argues that Bitcoin is capable of solving issues of hyperinflation, exchange, counterfeiting, and inaccessibility, therefore, cryptocurrency is more likely to be adopted in countries with a high level of inflation, corruption and low access to safe financial institutions.[66] Hileman identifies 40 variables and groups them into seven sub-indices which are the adoption

[61] Farell, 'An Analysis of the Cryptocurrency Industry', 12.
[62] Spenkelink, 'The Adoption Process of Cryptocurrencies', 57–65.
[63] Vlachos, Christodoulou, and Iosif, 'An Algorithmic Blockchain Readiness Index', 1.
[64] Sobhanifard and Sadatfarizani, 'Consumer-Based Modeling and Ranking of the Consumption Factors of Cryptocurrencies'.
[65] Bouraoui, 'The Drivers of Bitcoin Trading Volume in Selected Emerging Countries', 10.
[66] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis'.

factors. They include technology penetration, international remittances, inflation, size of the informal economy, finance repression, historical financial crises, and Bitcoin penetration.[67] Hileman, when creating The Bitcoin Market Potential Index, deliberately excluded a cryptocurrency regulation variable as the signal and efficacy of it concerning adoption were unclear. However, Hileman conceded that regulation may have a significant impact on adoption.[68] For the same reasons, I do not include the cryptocurrency adoption variable in my research. Yet, I examine if governments in their regulatory response to cryptocurrencies rely on factors that drive adoption.[69]

So, many studies examine cryptocurrency adoption factors. These factors include high inflation levels, dependence on remittances, technology penetration, and cryptocurrency regulation among others. In the following section I will analyse the literature on the latter.

1.3. How Do States Respond to Cryptocurrencies and Why?

A vast scope of studies is dedicated to cryptocurrency regulation and its challenges. In this section, I will examine it to find the most common paths that governments take to respond to Bitcoin and altcoins.

Currently, there is no unified approach to regulating cryptocurrencies in the world. The only similarity present across states is that cryptocurrency nowhere is recognized as legal tender.[70] One could expect all governments to ban cryptocurrencies immediately as this happened to private currencies in the nineteenth century. According to Polanyi's logic, the functioning of self-regulated markets poses a risk to destroy society, therefore the latter, to protect itself, would interfere free functioning.[71] Meanwhile, a limited number of countries have currently prohibited the use of free-functioning cryptocurrencies. Fletcher assumes that the

[67] Hileman, 'The Bitcoin Market Potential Index', 5.
[68] Hileman, 10.
[69] More on this find in Chapter 2.
[70] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World'.
[71] Polanyi, 'The Great Transformation', 210.

backlash on Bitcoin and its brethren has been little from governments globally because they are still observing this phenomenon to see if it is likely to survive and how it will evolve.[72]

Fletcher also notes that adoption of cryptocurrencies so far has not been hindered much due to regulation,[73] but this should not stop governments from adopting cryptocurrency legislation as this gives some backing to users from fraud and can prevent money laundering, terrorism financing and tax evasion, for which Bitcoin and altcoins are notorious. Marian suggests a conceptual framework for regulating cryptocurrencies that would limit their use in criminal behaviours but would not impair their innovative potential, such as reduction of transaction costs.[74] He et al. emphasize the necessity for protecting consumers, establishing taxation of virtual currencies, exchange controls, and capital flows management as well as ensuring financial stability and monetary policy through regulation. It may seem easier said than done, however, as cryptocurrencies pose various challenges to regulators and watchdogs – from defining them to monitoring and establishing transnational regulation.[75]

A range of authors establishes various scenarios or paths that governments may or already follow in response to cryptocurrency adoption. Doguet sees three ways of responding to cryptocurrencies: leave it to self-regulation, regulate market participants, or prohibit.[76] Vlachos et al. distinguish three paths for defining the legal status of cryptocurrencies: official recognition, the prohibition of activities related to cryptocurrencies and leaving the legal status in the grey area.[77] Guadamuz et al., relying on the work of Mayer-Schönberger et al. about the regulation of virtual worlds,[78] establish five possible scenarios for regulatory actions regarding virtual currencies: 'virtual sovereigns' (equal to self-regulation), prohibition, selective

[72] Fletcher, 'Currency in Transition: An Ethnographic Inquiry of Bitcoin Adherents', 54.
[73] Fletcher, 54.
[74] Marian, 'A Conceptual Framework for the Regulation of Cryptocurrencies', 53.
[75] He et al., 'Virtual Currencies and Beyond', 24–34.
[76] Doguet, 'The Nature of the Form: Legal and Regulatory Issues Surrounding the Bitcoin Digital Currency System', 1143.
[77] Vlachos, Christodoulou, and Iosif, 'An Algorithmic Blockchain Readiness Index', 6–7.
[78] Mayer-Schöenberger and Crowley, 'Napster's Second Life?'

prohibition, selective regulation which encompasses a do-nothing approach, and 'real-world assisted VC self-governance' (self-regulation under governmental support).[79] These scenarios I will later apply when establishing an index of governmental response to cryptocurrencies.[80]

Another group of authors have classified governmental responses to cryptocurrencies in different ways. Blandin et al. distinguish four types of regulatory responses: existing regulation (application of existing laws to crypto-asset regulation), retrofitted regulation (amendment of existing laws), bespoke regulation (creation of new regulation specifically for crypto-assets), and bespoke regulatory regime (creation of laws for financial technologies, part of which are crypto-assets).[81] Meanwhile, Bollen points at legal issues of cryptocurrency regulation, related to such domains as general financial services, banking, currency, and legal tender.[82]

Literature review shows that most research dedicated to cryptocurrency regulation has been done in the field of legal studies. When it comes to the international political economy, little has been done to explain governmental motivations behind choosing certain regulatory paths. Shirakawa et al. have made one of the first attempts to explain which factors drive *de jure* openness to cryptocurrencies. For that, the authors classified economies based on their policies in response to Bitcoin and altcoins. Thus, they identified three approaches: to ban, to regulate (restrict), and to fully liberalize or make no explicit regulations and prohibitions.[83] The weakness of this approach, however, is that the authors left no space for distinguishing the difference between the hands-off approach and deliberate liberalization of cryptocurrencies, which they aimed to do.[84] Nevertheless, through regression analysis it was found that effective governance institutions are less likely to apply restrictive regulation to cryptocurrencies.

[79] Guadamuz and Marsden, 'Blockchains and Bitcoin', 20–21.
[80] Find more in Chapter 3.
[81] Blandin et al., 'Global Cryptoasset Regulatory Landscape Study', 41–42.
[82] Bollen, 'The Legal Status of Online Currencies: Are Bitcoins the Future?', 19.
[83] Shirakawa and Korwatanasakul, 'Cryptocurrency Regulations: Institutions and Financial Openness', 7.
[84] Shirakawa and Korwatanasakul, 1.

Financial openness, meanwhile, was not found to be significant concerning *de jure* openness to cryptocurrencies.

Although the importance and novelty of such research cannot be underestimated, it has its disadvantages. Besides the fact that Shirakawa et al.'s index does not show if governments deliberately liberalize cryptocurrencies, the quality of the data itself and how the authors used it for creating the index raise concerns too. They relied on three sources of cryptocurrency regulation across the world, which are the Global Legal Research Centre of the Library of Congress report,[85] and two online sources – Bitcoin Market Journal 2018[86] and CoinStaker 2018.[87] On CoinStaker, before it stopped functioning between April-May 2020, it was not indicated who and how collected information regarding cryptocurrencies. Also, I found discrepancies between information in the three sources and how Shirakawa et al. categorized economies' approaches to regulation. For example, Afghanistan was not present in any of the above-mentioned sources, yet the authors assigned it value 1 (restrictive regulation). Sierra Leone was mentioned only on CoinStaker and, according to the website, it only had regulation on the blockchain, yet the authors assigned to it the value 1. In some cases, countries had no regulation, while in Shirakawa et al.'s index they were assigned the wrong value. In total, I identified about ten discrepancies of this kind. Thus, when creating my index of governmental response to cryptocurrencies, I addressed issues present in Shirakawa et al.'s research.

In conclusion, the existing literature has yet to place cryptocurrencies in the international political economy agenda. Very few studies have been made to determine factors that influence the stance of governments regarding cryptocurrencies, although a lot of pieces of research have been dedicated to the factors of cryptocurrency adoption. The next chapters of this thesis will address the established gap.

[85] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World'.
[86] Bitcoin Market Journal, 'STO Regulations by Country'.
[87] CoinStaker, 'Cryptocurrency Legal Status by Individual Nations'.

Chapter 2. Theory. Political Systems, Development and Cryptocurrency Regulation

This chapter provides an overview of theories behind cryptocurrencies and discusses the links between governmental response to cryptocurrencies and factors that may influence it.

2.1. Theory Behind Cryptocurrencies

Understanding cryptocurrencies' relation to political economy by comparing them to the pre-nineteenth century private currencies, that was done in the previous chapter, is not enough. For this reason, in this section I will look into theories that back cryptocurrencies before moving to the drivers of their regulation.

Ammous points out that Satoshi Nakamoto, Bitcoin's creator, was "evidently influenced by the Austrian School of Economics".[88] The established economy system envisages that central banks permit growth without a deflationary increase of the value of a currency, thus, money supply enlarges slowly and under control.[89] Bitcoin, however, is different, as the supply of its units cannot be manipulated – only 21 million bitcoins are expected to be mined. As of today, over 90% of bitcoins have already been mined – around 18.3 million of them are in use, stored or lost.[90] Here lies the link between cryptocurrencies and the Austrian theory of money. The Austrian school argues that with fixed money supply economic growth will cause deflation, which will allow people to buy increasing amounts of goods and services. Ammous explains that if more people use Bitcoin once all its units are mined, its purchasing power will rise. This will help Bitcoin establish itself as a currency since it will be able to better fulfil the functions of medium of exchange and store of value.[91] However, Bitcoin is not fiat money, at least yet. Although it is still argued if it does or does not have intrinsic value, it is not backed by the

[88] Ammous, 'Economics Beyond Financial Intermediation', 11.
[89] Bernanke, 'Deflation: Making Sure "It" Doesn't Happen Here'.
[90] Statista, 'Number of Bitcoins in Circulation Worldwide from 4th Quarter 2012 to 1st Quarter 2020'.
[91] Ammous, 'Economics Beyond Financial Intermediation', 12.

government. Wijk applies Kovenock and De Vries's theory[92] to explain its existence. Thus, Bitcoin's value is based on the belief of its investors and buyers that it will retain its value while they possess it.[93]

Clegg goes further and applies the Austrian economic theory to cryptocurrencies use to show that Bitcoin has the potential to become a financial solution for developing countries.[94] While indeed Bitcoin does provide a potential alternative payment system, particularly, for developing and emerging economies, it is a short-term solution with neo-colonial tinges. Political critique of cryptocurrencies implies that Bitcoin offers an easy solution of escaping to the Internet instead of solving fundamental issues of the already established system with drastic discrepancies between developed and developing states.[95]

Nevertheless, it is still crucial to talk about solutions that cryptocurrencies like Bitcoin can bring into this world. Ammous argues that Bitcoin can be seen as an embodiment of Hayek's concept[96] of distributed knowledge.[97] Sobhanifard et al. reveal that central banks, particularly in developing countries, as well as financial institutions, public policymakers, and the general public, can monetize on factors that promote cryptocurrency use.[98] However, are governments themselves aware of this when choosing or not choosing certain regulatory paths? This is one of the questions I am addressing with the research. In the next section, I will draw links between factors that influence cryptocurrency adoption and its regulation before testing my hypotheses.

[92] Kovenock and De Vries, 'Fiat Exchange in Finite Economies'.
[93] Wijk, 'What Can Be Expected from the Bitcoin?', 4.
[94] Clegg, 'Could Bitcoin Be A Financial Solution for Developing Economies?'
[95] Scott, 'How Can Cryptocurrency and Blockchain Technology Play a Role in Building Social and Solidarity Finance?', 8.
[96] Hayek, 'The Use of Knowledge in Society'.
[97] Ammous, 'Economics Beyond Financial Intermediation', 17.
[98] Sobhanifard and Sadatfarizani, 'Consumer-Based Modeling and Ranking of the Consumption Factors of Cryptocurrencies', 8.

2.2. Political, Macroeconomic Factors of Cryptocurrency Adoption and Regulation

In this thesis, I examine whether political factors, as well as developmental factors that matter in cryptocurrency adoption, have their impact on governmental response to cryptocurrencies. Based on strong evidence from the existing literature that democracy is correlated with capital openness,[99] I expect the level of democracy to explain governmental regulatory choices regarding cryptocurrencies. Also, as independent variables I include factors that affect cryptocurrency adoption. As can be derived from the 2014 works of Hileman[100] and Darlington,[101] some of the most important factors that are expected to drive wider adoption of cryptocurrency in the future are high inflation, remittance dependence and high level of corruption. I test if governments when choosing a certain policy stance on cryptocurrencies at present are motivated or influenced by the same factors. I add one control variable – GDP per capita as it has a connection with the main independent variables.

I posit that higher levels of democracy are positively associated with permissive regulation and the overall liberal response of governments to cryptocurrencies. Although democracy has not been mentioned as a driver of wider cryptocurrency adoption in the reviewed literature, I include it as an explanatory variable due to robust theoretical and empirical grounding related to financial openness. Polanyi wrote that the constitution of the political sphere on par with the degree of economic distress affected how far states went with market interference.[102] This implies that liberal democracies would be less likely to resort to protectionism, yet, this does not exclude the absence of regulations. Democracies may tend to have more sophisticated and refined legislation as they tend to possess a robust rule of law.[103]

[99] Dailami, 'Financial Openness, Democracy, and Redistributive Policy', 25.
[100] Hileman, 'The Bitcoin Market Potential Index'.
[101] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis'.
[102] Polanyi, 'The Great Transformation', 216.
[103] Raban, 'The Rationalization of Policy', 47.

Therefore, they would be more likely to regulate cryptocurrencies. Since there has been found a positive and statistically significant correlation between democracy and open capital flows,[104] I expect that regulation of cryptocurrencies in democracies would rather be permissive than restrictive. Shirakawa et al. have previously found that financial openness has no significant impact on permissive cryptocurrency regulation, however, they have established that cryptocurrencies are less restricted in states with the more sophisticated legislature and high quality of legal systems and institutions.[105] Thus, I posit that states which support financial development, in particular, have open capital flows, are also more likely to support cryptocurrencies market, which is dominated by investors and traders rather than those who use cryptocurrency as a medium of exchange[106] and also represents a new financial development.[107] In contrast to Shirakawa et al.'s work, where authors did not draw a line between the hands-off approach and permissive regulation, I will ensure such distinction. Concerning autocratic governments, it may be assumed that, in contrast to democracies, they would be more likely to choose the path of protectionism and ban cryptocurrencies, which are cosmopolitan and foreign. This is because capital controls are more likely in countries with the monetary policy under the firm control of governments.[108] The alternative hypothesis, however, would be that autocratic governments may have a liberal or neutral approach to cryptocurrencies. This assumption stems from Pond's finding that autocratic rulers may use liberalization for their purposes, including stimulation of the economy, stabilization of their rule, or reduction of redistribution in anticipation of democratization.[109]

The next hypothesis, also related to a political factor, is that countries with higher corruption would be more likely to impose strict regulations on cryptocurrencies or completely

[104] Dailami, 'Financial Openness, Democracy, and Redistributive Policy', 25.
[105] Shirakawa and Korwatanasakul, 'Cryptocurrency Regulations: Institutions and Financial Openness', 10.
[106] He et al., 'Virtual Currencies and Beyond', 17.
[107] Shirakawa and Korwatanasakul, 'Cryptocurrency Regulations: Institutions and Financial Openness', 6.
[108] Grilli and Milesi-Ferretti, 'Economic Effects and Structural Determinants of Capital Controls', 544.
[109] Pond, 'Financial Liberalization'.

prohibit them. Darlington expects cryptocurrency adoption to thrive in developing countries with no secure financial infrastructure and corruption as a status quo.[110] If Bitcoin and its brethren are viewed as a money-laundering opportunity, most likely a country with high corruption levels would take a neutral stance on cryptocurrencies. If cryptocurrencies, however, are seen as assets and financial opportunities for the public, it is more likely that corrupt governments would restrict them. The existing literature supports the latter assumption. In particular, Chinn et al. have found that in emerging market economies with a lower level of corruption, on par with a higher level of bureaucratic quality, law and order, may amplify the effect of financial opening when stimulating equity markets development.[111] Meanwhile, Dreher and Siemers established that higher corruption leads to stricter regulations because it reduces the government's ability to collect tax revenue.[112] Since taxation of cryptocurrencies is a complex issue and poses challenges to tax authorities,[113] corrupt governments indeed might rather ban them.

Regarding macroeconomic factors, I conjecture that high levels of inflation can lead to a more negative government stance on cryptocurrencies. Hayek implied that private currencies can be stronger and more stable than state ones,[114] so with wider adoption as cryptocurrencies would gain more value, they could pose a threat to weak state currencies. According to Darlington, Bitcoin has the potential to solve hyperinflation issues, thus, people would embrace cryptocurrencies in states with weak and volatile state currencies.[115] Governments, concerned with state currencies being endangered, would impose strict regulations on Bitcoin and its

[110] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis', 12.
[111] Chinn and Ito, 'What Matters for Financial Development? Capital Controls, Institutions, and Interactions.', 3.
[112] Dreher and Siemers, 'The Nexus between Corruption and Capital Account Restrictions', 257.
[113] Khandelwal, 'Taxation of Cryptocurrency Hard Forks', 32.
[114] Hayek, 'Choice in Currency. A Way to Stop Inflation'.
[115] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis', 7–10.

brethren. Moreover, this hypothesis is supported by earlier findings of Grilli and Milesi-Ferretti which say that capital controls are associated with higher inflation.[116]

Also, I expect high levels of countries' dependence on remittances to be positively associated with openness to cryptocurrencies. Since cryptocurrencies have lower transaction costs and higher processing speed, they have the potential of changing the remittance market, especially in regions with high transaction costs like Africa, as Maloumby-Baka and Kigombe[117] and Folkinshteyn et al.[118] suggest. A range of authors have dedicated their research to 'rebittances' – remittances sent in cryptocurrencies directly from a user to user or though cryptocurrency remittance operators – and suggest that remittance market is one of the most likely use cases for cryptocurrencies (Parsons,[119] Scott,[120] Cotton[121]). Governments that heavily rely on remittances, therefore, are expected to embrace the new technology to ease the money sending process for their citizens. This hypothesis is supported by the study of Beine et al., which shows a strong positive statistical and economic effect of remittances on financial openness.[122]

Since cryptocurrency adoption has been expected to prosper predominantly in developing countries, though currently, it seems to reside in developed states,[123] I include GDP per capita as a variable to control for the influence of economic development on governmental response to cryptocurrencies. As capital controls are more likely to be imposed in poorer countries with less developed tax systems,[124] I would expect a more positive governmental

116 Grilli and Milesi-Ferretti, 'Economic Effects and Structural Determinants of Capital Controls', 517.
117 Maloumby-Baka and Kingombe, 'The Quest to Lower High Remittance Costs to Africa: A Brief Review of the Use of Mobile Banking and Bitcoins', 3.
118 Folkinshteyn, Lennon, and Reilly, 'The Bitcoin Mirage: An Oasis of Financial Remittance'.
119 Parsons, 'Bitcoin – Sending Money Home'.
120 Scott, 'How Can Cryptocurrency and Blockchain Technology Play a Role in Building Social and Solidarity Finance?', 5–6.
121 Cotton, 'Sending a Bit More Coin Home? An Analysis of Retail User Protection in Bitcoin Remittance Markets'.
122 Beine, Lodigiani, and Vermeulen, 'Remittances and Financial Openness'.
123 Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis'.
124 Grilli and Milesi-Ferretti, 'Economic Effects and Structural Determinants of Capital Controls', 544.

response to cryptocurrencies in developed countries, rather than in developing, as they would have more developed tax systems. Shirakawa et al., however, found that economic development is negatively associated with liberal governments' stance on cryptocurrencies.[125] Since, as I have mentioned before, the authors did not distinguish between a neutral and permissive regulatory approaches to cryptocurrency, in my research, I expect to see different results on how economic development affects cryptocurrency regulation.

To conclude, an overview of theories behind cryptocurrencies suggests that Bitcoin and its brethren might be capable of solving issues of inflation and high transaction costs in developing and emerging market economies. Therefore, when establishing my hypotheses concerning governmental response to cryptocurrencies, I rely on factors that affect cryptocurrency adoption. One of my explanatory variables – the level of democracy – is not found to influence cryptocurrency adoption, yet I include it into my research due to solid theoretical and empirical grounding in relation to financial openness of countries. In the next chapter I present methodology and describe the data before introducing research results.

[125] Shirakawa and Korwatanasakul, 'Cryptocurrency Regulations: Institutions and Financial Openness', 11.

Chapter 3. Methodology and Data

This chapter explains methodological choices, describes the data and variables, and in detail explains the index of governmental response to cryptocurrencies, which I compiled, in terms of data sources and classification methods.

3.1. Methodology and Model Specification

This study aims to answer the following questions. Why do governments across the world respond to cryptocurrencies in different ways? Which factors affect state regulation and policy choices regarding cryptocurrencies? Do democracies, which tend to be more open financially,[126] also tend to support new financial development such as cryptocurrencies? Are governments across the world motivated and/or influenced by the same factors that affect cryptocurrency adoption[127] when choosing or not choosing a certain regulatory path? Thus, my dependent variable is a governmental regulatory response to cryptocurrencies. My independent variables are level of democracy, level of corruption, level of countries' dependence on remittances, and level of inflation. As a control variable, I choose GDP per capita in order to capture the effect of economic development that may contribute to more complex and developed tax, financial and economic structures that, in their turn, may lead to governmental positive stance on cryptocurrencies.[128]

To examine the relationship between governmental response to cryptocurrencies, on the one hand, and democracy, as well as factors that affect cryptocurrency adoption, on the other hand, I use a cross-sectional ordered logit model as the main estimation method. The reason for this is the unavailability of the multiple-year *Status* data. I also employ an ordered probit model to check if the significance of results remains the same.

[126] Dailami, 'Financial Openness, Democracy, and Redistributive Policy', 25.
[127] Hileman, 'The Bitcoin Market Potential Index'.
[128] Shirakawa and Korwatanasakul, 'Cryptocurrency Regulations: Institutions and Financial Openness', 7.

My model is specified as:

$$S_i = \beta_0 + \beta_1 \boldsymbol{X_i} + \beta_2 G_i + \varepsilon_i$$

where S_i refers to the outcome variable, which is the governmental response to cryptocurrencies in a country i (*Status*); $\boldsymbol{X_i}$ corresponds to a set of key independent variables, which include levels of democracy (*Polity2*), corruption (*Corruption*), and remittances (*Remittance*); G_i is a control variable which measures log GDP per capita (*log_GDPPC*); ε_i is an error term. Estimated coefficient β_1 is a parameter of interest, for instance, it captures the relationship between *Status* and *Polity2* in a country *i*.

In the next section I will describe all variables, specifically, how I created governmental response to cryptocurrencies index, and their measurement.

3.2. Data

The data in this research cover 130 economies over the period of 2013-1019. There are several reasons why the cross-sectional data consists of multiple years in this thesis. First, I aimed to lag independent variables. The data on the dependent variable – legal and regulatory status of cryptocurrencies – are not available across time, covering 172 economies as of 2018 only. Since new legislation takes time to adjust and since factors that could hypothetically influence it need to be captured in an earlier point of time than when the legislation was adopted, I took data for independent variables from 2017 predominantly. Second, in a few cases, though, the data were not available as of 2017, hence I took it from earlier or later years. For example, Polity IV data were available as of the 2013-2015 period only. Finally, the decision to include multiple years is justified by the fact that in the cross-section data the exact point in time is of lower importance.

The data are drawn from such sources as reports on cryptocurrency regulation in different countries, World Bank database, Transparency International corruption perception index, as well as Polity data series among others.

3.3.1. Index of Governmental Response to Cryptocurrencies

To measure the governmental response to cryptocurrencies, I created the index *Status*, which is based on ordinal variables that codify the regulation status of cryptocurrencies in 172 economies as of 2018.[129] The index is compiled based on the information from the Global Research Centre's report "Cryptocurrency Regulation Around the World",[130] Baker McKenzie's report "Blockchain and Cryptocurrency in Africa",[131] Trading Education cryptocurrency regulation ranking,[132] as well as from official central bank statements, reports in the media and other reliable sources on selected countries, such as Cuba,[133] Panama,[134] Paraguay,[135] Peru,[136] Turkey,[137] Uruguay,[138] and Uzbekistan,[139] as they were not covered in the above-mentioned sources, or information about them in those sources was incomplete.

I classified the economies based on their legal and regulatory stance on cryptocurrencies. First, I assigned the value 0 (*ban*) to those economies, which imposed a direct or implicit ban on cryptocurrencies or had no laws or regulations that would decriminalize cryptocurrencies. Second, I assigned the value 1 (*neutral*) to economies with the hands-off approach, which means that countries did not create specific laws for cryptocurrencies or did not amend the already existing laws, therefore, cryptocurrencies were not recognized legal, yet they were not considered illegal at the same time. Third, I assigned the value 2 (*legal*) to economies that took a conscious step to recognize cryptocurrencies as legal, e.g. created specific laws and regulations or amended the already existing laws, including those related to

[129] For a complete list of the economies, see Appendix A. Table 2.
[130] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World'.
[131] Baker McKenzie, 'Blockchain and Cryptocurrency in Africa'.
[132] Trading Education, 'Cryptocurrency Regulation Around the World in 2019 Ranked.'
[133] Guerrero et al., 'Buy cryptocurrencies in Cuba, a not so virtual "exchange"'.
[134] Diaz, 'Legal Opinion from the Superintendency of Securities of Panamá'.
[135]The Central Bank of Paraguay, 'Central Bank of Paraguay's Statement on Virtual Currencies or Cryptocurrencies'.
[136] The Central Reserve Bank of Peru, 'Risks of Cryptocurrencies'.
[137] Güden and Girinti, 'Legal Status of Cryptocurrencies in Turkey'.
[138] Rey, 'The Central Bank of Uruguay Changes Its Position on Cryptocurrencies and FinTech'.
[139] SputnikNews.ru, 'Restriction of Cryptocurrency in Uzbekistan Does Not Contradict Blockchain - Expert'.

taxation, anti-money laundering, protection of consumers, etc. With this approach to codifying, I ensured that the hands-off approach of governments, which often permits cryptocurrencies, is differentiated from the deliberate permission of cryptocurrency use. Thus, the higher the value, the more positive the regulatory response of the government is to cryptocurrency. I found that 112 economies have not responded to cryptocurrency adoption in any way, 35 economies banned cryptocurrency use, and 25 economies applied permissive regulations to it.

3.3.2. Measures of Independent and Control Variables

In this sub-section I will describe the independent and control variables as well as the data used for measuring them.

One of the key independent variables – the level of democracy – I capture using Polity IV's[140] *Polity2*. The state's level of democracy is measured between -10 (strongly autocratic) and -10 (strongly democratic). The scores for autocracy and democracy, which constitute *Polity2*, are evaluated from the state's nature of political participation, elections for openness and competitiveness, as well as the degree of checks on executive authorities. The data, extracted for *Polity2*, covers the period between 2013–2015 for all countries.

To control for the level of corruption (*Corruption*), I use Transparency International's Corruption Perceptions Index 2017.[141] In particular, I use the index's 2017 rank, which ranges from 1 to 178. This means that the higher the value, the higher the level of corruption in the country. This index reflects perceived levels of corruption in the public sector, according to experts and businesspeople.

Inflation captures the level of inflation, faced by households, in a single year. To measure it, I use World Bank Data[142] consumer price index (CPI) in annual percentages for 2017 for most countries and a single year from the time period between 2013-2016 for countries

[140] Polity IV (2014), 'Polity IV Project: Political Regime Characteristics and Transitions, 1800–2013'.
[141] Transparency International, 'Corruption Perceptions Index 2017: Global Scores'.
[142] World Bank Data, 'Inflation, Consumer Prices (Annual %)'.

that lack the data on the year of 2017. My choice of CPI as a measure is justified by the fact that it is also taken for capturing inflation by Hileman for the Bitcoin Market Potential Index.[143] For this index, the higher the value, the higher the level of inflation in a given country.

I use the *Remittance* independent variable to control for the countries' level of dependence on remittances. As a data source, I chose World Bank's Annual Remittances Data,[144] and I measure the *Remittance* variable in migrant remittance inflows as a share of GDP in 2019 (%).

To control for the effect of economic development that may contribute to the supportive governmental stance on cryptocurrencies, I use log GDP per capita (*log_GDPPC*). The data for this variable is taken from World Bank's data[145] on GDP per capita and is measured in US dollars, so the higher values of the variable are associated with a higher standard of living in countries. As a regressor, I use the natural log of GDP per capita. The data covers the year 2017 for most countries, and a single year between the period of 2013-2016 for countries that lack data on the year of 2017.

Below in Table 1 are presented descriptive statistics of all variables, including the dependent one. In particular, there are 172 observations for the *Status* variable. Its mean does not matter in this research as the variable is categorical, ranging from the value 0 to 2.

Table 1: Summary Statistics

Variable	Observations	Mean	Standard Deviation	Min.	Max.
Status	172	0.942	0.589	0	2
Polity2	146	4.425	6.146	-10	10
Corruption	157	84.280	51.250	1	178
Inflation	155	5.480	20.819	-1.261	254.947
Remittance	148	4.02	7.683	0.002	58.969
log_GDPPC	164	8.857231	1.460	5.680	12.014

Source: Author's compilation and calculation

[143] Hileman, 'The Bitcoin Market Potential Index'.
[144] World Bank Data, 'Annual Remittances Data (Updated as of April 2020)'.
[145] World Bank Data, 'GDP per Capita (Current US$)'.

Concerning the independent variables, *Polity2* has 146 observations, *Corruption* has 157, *Inflation* – 155, *Remittance* – 148, and *log_GDPPC* – 164. Eventually, 130 observations were captured in the regression.

In this research, I regress *Status* on the one side, and *Polity2*, *Corruption*, *Inflation*, *Remittance*, and *log_GDPPC* on the other one. The results of my ordered logit regression are presented in the following chapter.

Chapter 4. Empirical Results and Discussion

This chapter presents the empirical results of my examination of the relationship between governmental response to cryptocurrencies, on the one hand, and democracy, as well as factors that affect cryptocurrency adoption, on the other hand. Here is also provided a discussion on the basis of the findings. 130 countries are covered in this research, based on data availability.

The results of the ordered logit model with marginal effects, reported in Table 1, show the effects of the levels of democracy, corruption, inflation, and remittance dependence on the regulatory choices of governments regarding cryptocurrencies. As presented in the first column of Table 1, the coefficient on the level of democracy is statistically significant at the 1% level. The coefficient on the corruption level is statistically significant at the 10% level. The results remain robust applying the ordered probit specification.[146]

Table 2: Ordered Logit Regression Results and Marginal Effects

Dependent Variable: Governmental Response to Cryptocurrencies – Regulation Status

		Marginal Effects		
Independent Variable	**Coefficient**	**Ban**	**Neutral**	**Legal**
Level of democracy	0.103***	-0.015***	0.005	0.001**
(Polity2)	(0.037)	(0.005)	(0.004)	(0.004)
Level of corruption	-0.011*	0.002*	-0.001	-0.001
(Corruption)	(0.006)	(0.001)	(0.000)	(0.001)
Inflation	0.023	-0.003	0.001	0.002
(Inflation)	(0.016)	(0.002)	(0.001)	(0.002)
Remittance dependence	-0.007	0.001	-0.000	-0.001
(Remittance)	(0.024)	(0.003)	(0.001)	(0.002)
GDP per capita	0.000	-0.000	0.000	0.000
(log_GDPPC)	(0.212)	(0.031)	(0.010)	(0.020)
Constant cut1	-1.778			
	(2.256)			
Constant cut2	1.880			
	(2.263)			
Observations	130	130	130	130

Note: a) Standard errors in parentheses; *** p < 0.01, ** p < 0.05, * p < 0.1

Source: Author's compilation and calculation

[146] In Appendix B. Table 4, I performed the same exercise as in Table 2, using ordered probit regression. It reaffirms results of the ordered logit regression.

My results show that one unit increase in the level of democracy is associated with a higher chance of more positive governmental response to cryptocurrencies. With a higher level of democracy, the likelihood of cryptocurrency prohibition decreases by 1.5 percentage points holding the predictors at their mean values. By contrast, the likelihood of the governmental permissive regulatory approach to cryptocurrencies increases by 0.1 percentage points, should the level of democracy rise by one unit. There are no significant associations found between the level of democracy and governmental hands-off approach, though. The regression results, therefore, support my hypothesis and imply that democracies, which tend to have a more developed and sophisticated legislature,[147] as well as support financial development, for example, through financial openness,[148] are less likely to ban cryptocurrencies and are more likely to recognize them legally. The alternative hypothesis that countries with low levels of democracy would be likely to liberalize the cryptocurrency market to pursue their goals[149] has not been supported.

The results regarding corruption imply that with a higher corruption level in a country, the likelihood of cryptocurrency prohibition increases, as predicted, however, their significance is too low to be trusted. At the same time, I have not found evidence that factors important for cryptocurrency adoption, namely, level of inflation and dependence on remittances, have an effect on the governmental response to cryptocurrencies.

By considering the GDP per capita control variable, I observed counterintuitive results. According to my results, there is no evidence that the variable has an association with how governments react to cryptocurrencies on a regulatory level. I expected, though, that greater economic development would positively affect permissive regulation of cryptocurrencies the same way as economic development positively affects capital openness thanks to more

[147] Raban, 'The Rationalization of Policy', 47.
[148] Dailami, 'Financial Openness, Democracy, and Redistributive Policy', 25.
[149] Pond, 'Financial Liberalization'.

developed tax systems[150] (on the basis of the assumption that cryptocurrencies are seen as new financial development and an economic opportunity[151]). Shirakawa et al., who did not distinguish between permissive regulation of cryptocurrencies and a hands-off approach, found that higher GDP per capita was associated with stronger regulation and even ban of cryptocurrencies.[152] Such observations may signalize that when examining the relationship between cryptocurrency regulation and economic development, it is important to single out tax-related regulation from other forms of cryptocurrency regulation, and this can be a ground for further research.

The overall results imply that political factors matter more in cryptocurrency regulation than factors, which are important for cryptocurrency adoption. This would mean that decisions of governments on cryptocurrency are not based on forces that would enhance or hinder user choices, and, perhaps, shows that governments do not take into consideration solutions that cryptocurrencies may bring, e.g., change of the remittance market, when taking a certain stance on cryptocurrencies. Governmental response to cryptocurrencies is rather determined by regulatory practices that are common in certain political systems.[153]

Additionally, out of 172 economies, whose regulatory response to cryptocurrencies I analysed for creating the *Status* index, only 60 economies took a clear position on cryptocurrencies – either to ban them or recognize legally. The results of the regression presented above reflect the regulatory choices of these economies. The majority, though, – 112 economies – have not taken any side when responding to cryptocurrencies. Therefore, it is too early to say if governments would keep the monetary power in their hands or let cryptocurrencies develop more. As Fletcher has rightly pointed out, states "seem to be waiting patiently to see whether bitcoin, or currency systems like it, remain stable enough to support

[150] Grilli and Milesi-Ferretti, 'Economic Effects and Structural Determinants of Capital Controls', 544.
[151] Fletcher, 'Currency in Transition: An Ethnographic Inquiry of Bitcoin Adherents', 46.
[152] Shirakawa and Korwatanasakul, 'Cryptocurrency Regulations: Institutions and Financial Openness', 11.
[153] Lipsky, 'Rulemaking as a Tool of Democracy. Reclaiming the Debate on Regulation', 31.

long term and sustained growth".[154] The results of the regression do not show any significant effects of the considered factors on the neutral approach to cryptocurrencies.

This research contributes to the emerging literature on the drivers of governmental response to cryptocurrencies and may contribute to policy discussions on adopting cryptocurrencies as financial technology in states which so far have embraced the hands-off approach. The study reaffirms previous findings that democracy matters for financial openness,[155] and places cryptocurrency as a financial development into the context of such openness.

[154] Fletcher, 'Currency in Transition: An Ethnographic Inquiry of Bitcoin Adherents', 54.
[155] Dailami, 'Financial Openness, Democracy, and Redistributive Policy', 25.

Conclusion

As cryptocurrencies emerged in the absence of effective regulation and combine features of currencies, payment systems, and commodities, they have challenged and continue challenging lawmakers and regulators around the world. Nowadays, there is no single approach to cryptocurrency regulation – some countries directly or indirectly ban them, some legally recognize them and provide protection to their users, while others stay neutral to them. Several authors, including Hileman[156] and Darlington,[157] have pointed out that cryptocurrencies have the greatest potential in developing countries as they can solve the issues of hyperinflation, high costs of remittances and counterfeiting. However, different developing countries choose different paths for cryptocurrency regulation, for example, Pakistan and Nigeria ban Bitcoin while Mexico and South Africa embrace it. Why is this so? Why do developed countries have a different stance on cryptocurrency too, for example, while Canada recognizes it legal, France stays neutral? The existing literature fails to address these puzzles.

This study answers the question of why the regulation of cryptocurrencies differs across the world. I argue that this is due to the forms of governments that countries have. Democracies, which are believed not to be able to exist without the rule of law, have more developed and sophisticated legislatures,[158] thus, they are capable of finding better regulatory solutions for cryptocurrencies without banning them. Democracies also tend to be more prone to financial openness,[159] hence, they might be more open to cryptocurrencies as new financial development. I also assume that governments, when choosing certain regulatory paths regarding cryptocurrencies, may also be influenced by factors that drive cryptocurrency adoption, namely corruption, inflation, and dependence on remittances.

[156] Hileman, 'The Bitcoin Market Potential Index'.
[157] Darlington III, 'The Future of Bitcoin: Mapping the Global Adoption of World's Largest Cryptocurrency Through Benefit Analysis'.
[158] Raban, 'The Rationalization of Policy', 47.
[159] Dailami, 'Financial Openness, Democracy, and Redistributive Policy', 25.

To answer the above-stated question, I created an index of governmental response to cryptocurrencies and regressed it against the levels of democracy, corruption, inflation, and remittance dependence using an ordered logit model. My results have confirmed the hypothesis that democracies are less likely to prohibit cryptocurrencies and are more likely to apply permissive regulations to them. These results are statistically significant and are robust applying ordered probit regression. There is no evidence, however, that factors important for cryptocurrency adoption, as well as the level of economic development, are associated with the governmental response to cryptocurrencies.

My findings imply that political factors matter more in how governments respond to cryptocurrencies. This can be explained by the notion that developed jurisdictions, which tend to be democracies with inseparable rule of law,[160] create regimes for dealing with broader protection of consumers and issues of market integrity in the financial services industry,[161] where cryptocurrencies have been introduced. At the same time, the findings may imply that governments are yet to respond to cryptocurrencies as solutions for the remittance market and high inflation. This paper contributes to the emerging literature on factors that influence cryptocurrency regulation and may contribute to policy discussions on the same matter.

My research, however, has its limitations. First, it does not cover such non-regulatory responses of governments to cryptocurrencies as state-issued cryptocurrencies or CBDCs and does not capture ICOs and blockchain regulations. Second, since there is limited information on cryptocurrency regulation across time, the research focuses predominantly on the 2017-2018 time period. Third, it did not aim to establish all possible factors that may boost or hinder cryptocurrency recognition but instead it provides a general overview of some political and macroeconomic factors that may influence cryptocurrency recognition and regulation.

[160] Raban, 'The Rationalization of Policy'.
[161] Bollen, 'The Legal Status of Online Currencies: Are Bitcoins the Future?', 20.

The limitations of this thesis, nevertheless, pave the way for potential research on cryptocurrencies. In particular, alternative ways of governmental response, in relation to the regulatory one, can be examined. There is a range of countries that have already created or are working on designing state or regional cryptocurrencies or CBDCs, including St. Kitts and Nevis, China, Sweden, Venezuela, and Lithuania.[162] Some of them have banned, while others have embraced or stayed neutral to cryptocurrencies. It would be interesting to find out if governments that work on issuing or have already issued CBDCs are trying to keep the monetary power in their hands by distracting consumers from cosmopolitan and decentralized cryptocurrencies – and if they are banning cryptocurrencies in order to bring state-solutions like, for example, China. Another suggestion for future research would be to study cryptocurrency regulation changes across time. Today, unfortunately, there are no available data on this, but with time, as more data becomes available, unusual patterns may appear. Finally, it is worth considering factors that hinder permissive cryptocurrency regulation and recognition, such as lack of infrastructure, low level of technology penetration, high energy consumption and cost of cryptocurrency mining, weakness of tax systems, risks associated with money laundering and disruption of the national currency, and so on.

[162] Global Legal Research Center, 'Regulation of Cryptocurrency Around the World', 6.

Appendices

Appendix A

Table 3: Index of Governmental Response to Cryptocurrencies

Afghanistan	1	Colombia	0	Iceland	0
Albania	1	Congo, Dem.	1	India	1
Algeria	0	Congo, Rep.	1	Indonesia	0
Angola	1	Costa Rica	1	Iran, Islamic Rep.	0
Anguilla	2	Cote d'Ivoire	1	Iraq	0
Antigua and Barbuda	1	Croatia	1	Ireland	1
Argentina	1	Cuba	1	Isle of Man	2
Armenia	1	Cyprus	1	Israel	2
Australia	2	Czech Republic	1	Italy	2
Austria	2	Denmark	1	Jamaica	1
Azerbaijan	1	Djibouti	1	Japan	2
Bahamas, The	2	Dominica	1	Jersey	2
Bahrain	0	Dominican Republic	0	Jordan	1
Bangladesh	0	Ecuador	1	Kazakhstan	1
Barbados	1	Egypt, Arab Rep.	0	Kenya	0
Belarus	2	El Salvador	1	Korea, Rep.	2
Belgium	1	Equatorial Guinea	1	Kosovo	1
Belize	1	Eritrea	1	Kuwait	0
Benin	1	Estonia	2	Kyrgyz Republic	1
Bermuda	1	Eswatini (Swaziland)	1	Latvia	2
Bhutan	1	Ethiopia	1	Lebanon	1
Bolivia	0	Finland	1	Lesotho	0
Bosnia and Herzegovina	1	France	1	Libya	0
Botswana	1	Gabon	1	Liechtenstein	2
Brazil	1	Gambia, The	1	Lithuania	0
British Virgin Islands	1	Georgia	1	Luxembourg	1
Brunei Darussalam	1	Germany	2	Macao SAR, China	0
Bulgaria	2	Ghana	0	Madagascar	1
Burkina Faso	1	Gibraltar	1	Malaysia	1
Burundi	1	Greece	1	Malta	1
Cambodia	1	Grenada	1	Marshall Islands	1
Cameroon	1	Guatemala	1	Mauritania	1
Canada	2	Guernsey	1	Mauritius	2
Cayman Islands	2	Guinea	1	Mexico	2
Central African Republic	1	Honduras	0	Moldova	1
Chile	1	Hong Kong SAR, China	1	Mongolia	1
China	0	Hungary	1	Montserrat	1

Montenegro	1	Qatar	0	Tanzania	1
Morocco	0	Romania	1	Thailand	0
Mozambique	1	Russian Federation	1	Togo	1
Myanmar (Burma)	1	Rwanda	1	Trinidad and Tobago	1
Namibia	0	St. Kitts and Nevis	1	Tunisia	1
Nepal	0	St. Lucia	1	Turkey	1
Netherlands	1	St. Vincent and the Grenadines	1	Uganda	1
New Zealand	1	Samoa	1	Ukraine	1
Nicaragua	1	Saudi Arabia	0	United Arab Emirates	0
Niger	1	Senegal	1	United Kingdom	1
Nigeria	0	Serbia	1	United States of America	2
North Macedonia	0	Singapore	2	Uruguay	1
Norway	1	Slovak Republic	1	Uzbekistan	0
Oman	0	Slovenia	1	Vanuatu	1
Pakistan	0	South Africa	2	Venezuela, RB	2
Panama	1	Spain	1	Vietnam	0
Paraguay	1	Sweden	1	Yemen, Rep.	1
Peru	1	Switzerland	1	Zambia	1
Philippines	2	Syrian Arab Republic	1	Zimbabwe	0
Poland	1	Taiwan	0		
Portugal	1	Tajikistan	1		

Note: a) Economy groupings are performed in the alphabetical order.
b) 0 = “ban”; 1 = “neutral”; 2 = “legal”.
Source: Author’s compilation and calculation.

Appendix B

Table 4: Ordered Probit Regression Results and Marginal Effects

Dependent Variable: Governmental Response to Cryptocurrencies – Regulation Status

		Marginal Effects		
Independent Variable	**Coefficient**	**Ban**	**Neutral**	**Legal**
Level of democracy	0.057***	-0.015***	0.005	0.010**
(Polity2)	(0.021)	(0.006)	(0.003)	(0.004)
Level of corruption	-0.006*	0.002*	-0.000	-0.001
(Corruption)	(0.004)	(0.001)	(0.000)	(0.001)
Inflation	0.014	-0.004	0.001	0.003
(Inflation)	(0.009)	(0.002)	(0.001)	(0.002)
Remittance dependence	-0.004	0.001	-0.000	-0.001
(Remittance)	(0.014)	(0.004)	(0.001)	(0.003)
GDP per capita	0.023	-0.006	0.002	0.004
(log_GDPPC)	(0.124)	(0.032)	(0.010)	(0.023)
Constant cut1	-0.854			
	(1.309)			
Constant cut2	1.305			
	(1.318)			
Observations	130	130	130	130

Note: a) Standard errors in parentheses; *** p < 0.01, ** p < 0.05, * p < 0.1

Source: Author's compilation and calculation

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