

# THE USE OF BITCOINS IN LIGHT OF THE FINANCIAL CRISIS: THE CASE OF GREECE

*Research full-length paper*

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## **Abstract**

*In 2008, following the outbreak of the global financial crisis, a new trading system emerged that was made possible by cryptographically-produced currencies. Among them, the most popular digital cryptocurrency is undoubtedly the Bitcoin. This alternative way of trading quickly captured the interest of both businesses and consumers. Combined with a general lack of confidence towards financial institutions, central governments, and the effect of capital controls imposed across several countries, Bitcoins began being used extensively for funds transfer across borders and general payments. However, it is unclear whether the use of Bitcoins is extensive enough so as to lead to complete or partial disintermediation of monetary transactions, and whether users understand how the technology works and what are the inherent risks of this alternative payment mechanism. This paper addresses these questions through a survey-based study, conducted within the Greek context, where capital controls are still active and awareness regarding cryptocurrencies seems to be on the rise. Our findings show that despite that end-users of Bitcoin are somewhat concerned with regards to security issues, they are nevertheless interested in its use for identifying new business opportunities and bypassing residency-based measures, such as capital controls.*

*Keywords: bitcoin, cryptocurrency, blockchain, digital currencies, electronic transactions.*

## **1 Introduction**

The financial crisis that erupted in late 2007 in the USA is possibly one of the many reasons that led to the publication of the paper titled “Bitcoin: A Peer-to-Peer Electronic Cash System”, written by Satoshi Nakamoto. In this paper, Nakamoto puts forth the idea of a cryptographically-produced digital currency, i.e., a cryptocurrency, that could function as an alternative to fiat currencies and as a form of payment (Nakamoto, 2008). The idea behind Bitcoin was that of creating a landscape where regulators, financial institutions and sovereign states would have no control over the creation and the market price of the currency. Instead, the currency itself would be created based on a mathematical formula and through a peer-to-peer network that would instil trust in any and all transactions. It was envisaged that the Bitcoin could replace fiat money and gradually this would put an end to financial crises, to the high transactions costs and the necessity of placing one’s trust to an intermediary. In 2009, the Bitcoin made its first, fully functional appearance.

The idea of cryptocurrencies is not new. Chaum had proposed the use of cryptographic protocols that would allow the development of a fully anonymous payment system. This was seen as a solution toward ensuring securing personal privacy in electronic transactions (Chaum, 1983). However, it is the Bitcoin that popularised the concept of cryptocurrencies and to date it remains the most popular decentralised cryptocurrency with the highest and rather notable market capitalisation. In this research, our aim is to investigate the level of Bitcoin’s adoption by consumers and businesses within the Greek context. In doing so, we focus on businesses’ and consumers’ understanding and knowledge regarding the underlying technology, their awareness of the risks and opportunities, as well as their opinion regarding the role of the central bank and the government. It should be noted that this research took

place during 2017 against the backdrop of capital controls. In the summer of 2015, the Greek government introduced capital controls as a result of the state debt crisis and in order to avoid the collapse of its banking system. Therefore, our findings should be seen with caution as some people are said to have found a way to circumvent the imposed measures in order to either satisfy their everyday transaction and financial needs or to pull their funds out of the Greek banking system.

The remainder of the paper is organised as follows: first, we discuss digital currencies and focus on cryptocurrencies and the Bitcoin in particular, examining how it is already being used in electronic transactions. In doing so, we further highlight the possible risks for consumers, as well as the opportunities for businesses. We then discuss issues pertaining to the legal status of Bitcoin (money versus commodity, implicitly/explicitly illegal etc.) and the emerging regulatory implications that affect its wider adoption. In the next section we provide a detailed overview of the empirical setting of our study and our analysis. We then discuss our results and conclude our paper by suggesting paths for future research.

## 2 Background

Advances in technology have made possible everyday transactions within a cashless environment. Consumers today conduct transactions using debit and credit cards, and online payments with the help of electronic payments or through mobile banking applications. Against this backdrop, one can not but notice that another form of payments has begun attracting the interest of consumers and businesses alike, that which is supported by digital currencies (Pirjan, Petrosanu, Huth, & Negoita, 2015). What is interesting to note is that digital currencies propose an entirely new paradigm of transactions; while in the past all cashless transactions had a physical counterpart (i.e., payments through a mobile banking application correspond to actual physical funds stored somewhere), digital currencies suggest that any funds exist only in the digital world. Because of this, and other reasons, central banks, regulatory bodies and financial institutions have struggled over the recent years with the materiality of digital currencies in an attempt to decide on whether they should be treated as typical fiat money or as commodities (e.g., IMF, 2016; Sidahmed, 2016). In what follows, we discuss some of these aspects in more detail, as the features of digital currencies and regulatory matters can significantly support or inhibit the diffusion and adoption of cryptocurrencies, such as the Bitcoin.

### 2.1 Digital Currencies: Virtual Currencies and Cryptocurrencies

Digital currencies are created and stored in a digital form and exhibit typical functions of money (i.e., unit of account, medium of exchange and store of value) without however having a physical counterpart (Gans & Halaburda, 2015). The European Central Bank distinguishes digital currencies between Virtual Currencies and Cryptocurrencies (European Central Bank, 2012). *Virtual currencies* are unregulated digital currencies that are typically used for buying non-tangible products and services within online communities and games. Indeed, virtual currencies are typically issued by firms that are active in web 2.0 applications, online shopping and gaming. One example would be Amazon Coins that are issued by Amazon for purchasing books, music or applications from within the Android or the Amazon Store.

Cryptocurrencies (e.g., Bitcoin, Litecoin) are created, stored and transferred between parties by means of encryption techniques. Like virtual currencies, they are, too, independent of central banks, financial institutions and sovereign states. In this sense, their production is decentralised (although centralisation is possible), unregulated and transactions take place using pseudonyms (Miers, Garman, Green, & Rubin, 2013). However, the encryption techniques used are aimed at regulating the units issued and at verifying and authenticating any ensuing transfers. While neither virtual currencies nor cryptocurrencies have a physical counterpart, they are often exchanged for fiat money. For example, players of *Eve Online* (a world multiplayer online role-playing game) choose to exchange their ISKs (in-game currency) for regular money, despite that the licence agreement strictly prohibits it. Similarly, the prolifer-

eration of cryptocurrencies have led to the propagation of numerous exchanges around the world, where users can exchange their cryptocurrencies for regular money through national bank transfers, Amazon gift cards, cash deposits, and even by meeting in person.

## 2.2 The Introduction of Bitcoin

The Bitcoin is the first decentralized digital currency that operates on the basis of a peer-to-peer system. The peers are called miners because they mine bitcoins by running hash verification processes. These are very time and resource consuming and the miners are thus rewarded in bitcoins. The miners themselves validate directly any transactions taking place across the network without the need for any intermediary to monitor the process, and record them on a publicly available distributed ledger, i.e., the blockchain, to which all of them have access. All miners have the same rights and obligations and are responsible for monitoring the blockchain and any changes in records requires their consensus.

In other words, the technology ensures that the system can operate uninterrupted and that new miners will find incentives to join the network. However, as there is a fixed supply of bitcoins (21 million by 2140), the software is designed in a way that the production process becomes more difficult as time progresses and as more bitcoins are produced. The difficulty of the mining process gets harder and harder and more and more expensive, as this requires specialized equipment, significant electricity consumption, space and wages. In addition, the code dictates that every four years, the reward for miners gets reduced in half so that inflation can be controlled (Pagliery, 2014). This has led miners to form mining pools, by pooling their resources together so as to bring down their overall costs, increase their chances of solving a block and therefore make easier the mining process much easier and profitable for the team. In turn, they share the rewards based on their contribution in the generation of new blocks (Miller, Kosba, Katz, & Shi, 2015).

The Bitcoin is one of the many available cryptocurrencies today, but it is the one with the greatest market capitalization and the one that popularized the idea of cryptocurrencies. Its price has surged to \$2,581.91 and its trade volume over the last 6 months has doubled, from \$208 million (05/01/2017) to \$435 million (15/06/2017)<sup>1</sup>. This amount may appear insignificant when compared to the global economy; however it does illustrate an overall trend, which combined with other technological advances, such as the Internet of Things (for a more detailed discussion see (Beck & Müller-Bloch, 2017) and (Giaglis & Kypriotaki, 2014)) can support viable payment systems and give rise to new business opportunities.

The idea of a digital currency existed well before the advent of the Bitcoin. However initial efforts were not focused on providing a digital currency that could ensure anonymity above everything else (Dwyer, 2015). Instead, the concept behind the Bitcoin was making possible a payment mechanism that could facilitate transaction without risking double spending, the unauthorised reversal of a transaction, or needing escrow services (Nakamoto, 2008). Further, the Bitcoin was designed so as to protect the user's personal data. While it doesn't ensure full anonymity, it does ensure pseudonymity and despite that the full transaction history is available to everyone, this is not tied to the real personal data of the transacting individuals (Meiklejohn et al., 2016).

In other words, the Bitcoin was meant to act as an alternative payment mechanism to those offered by the traditional issuing and monitoring authorities (governments and banks), because the later were considered as untrustworthy with expensive commission fees (Dierksmeier & Seele, 2016). In this sense, it may be said that the underlying technologies of Bitcoin have manage to create a network of unknown and untrusted peers and in turn distil trust in it (Olnes, 2016). In doing so, transactions are faster and cheaper for all participating parties when compared to typical electronic transactions (Lo & Wang, 2014).

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<sup>1</sup> Data from Blockchain.info (accessed on 29/06/2017).

## 2.3 Status and Regulatory Issues

Despite its increasing popularity, the Bitcoin still remains outside the vernacular. We consider that the main reasons for this have to do with the lack of regulation, incidents that made their way to the press, tying Bitcoin to fraudulent activities, and inhibitors that relate to the overall complexity of the technology itself. With regards to regulatory matters, extant regulation varies significantly across countries and continents. For example, Nigeria's central bank has recently banned all virtual currencies (Opeyemi, 2017), Canada classifies the Bitcoin as an intangible asset and applies anti-money laundering regulations and counter-terrorist financing laws (Burgoyne, 2013), while Japan has recently recognised it officially as a payment method and Russia is looking into recognising this and other cryptocurrencies in an effort to tackle money laundering (Kharpal, 2017). In the Netherlands, during a 2014 court case, it was ruled that the Bitcoin resembles more "a commodity-like medium of exchange" because it doesn't fit known definitions of money (Ramasastry, 2014), and in 2016, a New York Federal court ruled that Bitcoins are indeed money on the grounds that they are "accepted as a payment for goods and services or bought directly from an exchange with a bank account" (Fortune, 2016).

Cyprus and Iceland are among the friendliest countries towards the Bitcoin. Following the financial crisis that hit Cyprus, the country embraced the Bitcoin technology in numerous ways; a bank began its operations transacting using bitcoins (Darlington, 2014), the University of Nicosia started accepting bitcoins for the payment of tuition fees, while it is also one of the first universities worldwide offering courses on Digital Currencies and has set up the Blockchain Initiative. Iceland has been for some years now the host to some of the largest mining farms and a paradox, as mining bitcoins has always been legal but not transacting with them (Tatar, 2016). What these suggest is that, in the absence of regulation, the case-by-case rulings, and the fragmented or contradictory regulation, have left room for the use of Bitcoin in illicit activities, which in turn has affected users' awareness. For example, the Bitcoin is often discussed in connection to the Silk Road, an online market place where users could trade drugs, weapons and the likes (Lo & Wang, 2014), as a support mechanism for money laundering and fraudulent behaviour (Burks, 2017), and has been involved in scandals, such as the MtGox case, a Tokyo-based Bitcoin exchange, which was running almost 70% of all transactions in 2013 and in 2014 shut down, having lost all bitcoins over the years (Nilsson, 2015).

However, keeping the Bitcoin unregulated is only one of the issues that make all these possible. While the Bitcoin in reality doesn't provide full anonymity, it does work on the basis of pseudonymity and provides a reasonable level of anonymity, as users can use different addresses for each and every transaction. This means that it is quite difficult to identify transacting parties and match them with the actual trade of illicit goods or the advertising, request and possible provision of questionable or illegal services (Meiklejohn et al., 2016), and this makes the Bitcoin very attractive for use in such activities.

As far as everyday use is concerned, we consider that the aspects of low usability further impede the diffusion of Bitcoin as an alternative form of payment. Everyday transactions require that the consumer can pay fairly easily and promptly and that she can receive a refund. Presently, there are numerous web-based (mobile or not) applications that mimic the functionality of a traditional wallet and which facilitate transferring many use cases from the traditional fiat currency to the cryptocurrency. However, the level of knowledge the average user would require to understand the surrounding terminology and the structure of the technology that would make her feel safe and transact in a fairly secure manner is for the time being fairly high. When compared to the available alternative, i.e., credit, debit cards and the likes, using bitcoins for transactions is still much more difficult and this limits the further proliferation of the technology.

## 3 Method and Data

Our study seeks to understand the level of diffusion and adoption of the Bitcoin within the Greek context, as well as consumers' and businesses' awareness regarding to the technology's potential. There-

fore, our study is largely exploratory and we designed it in a way that would allow us to assess participants' perceptions as far as risk and opportunities are concerned, regulatory issues, but also their actual use of the technology in their everyday practices.

For data collection purposes, we conducted a questionnaire-based survey, containing open and closed questions, which three sections: the first had to do with perceptions regarding e-banking, the second with general understanding and experience with Bitcoin and the third with perceptions regarding the opportunities offered through the technology. We made an effort to keep the questionnaire as short and straightforward as possible, so that participants could respond easily and without dedicating much time as many would be partaking during their work time. We pre-tested the questionnaire with the help of two researchers who are knowledgeable of the Bitcoin technology and have extensive experience in conducting questionnaire-based surveys. Based on this pilot, we proceeded with some rephrasing and sharpening of the questionnaire items and prepared the final version of the questionnaire.

We aimed at collecting data from Bitcoin users and individuals who have heard of Bitcoin in the past as an alternative payment method. We therefore adopted the snowball technique to approach and distribute the questionnaire through our contact lists, networks and friends, who then helped in further propagating it to their contact lists. At the same time, we contacted directly businesses and firms within our networks with an online presence and Greek officials, in order to capture the government's stance. The questionnaire was sent by e-mail or filled in during telephone interviews.

Our final sample comprises of Greek businesses that are active within the sectors of technology, services, education and construction. More specifically, these businesses are businesses of the automotive industry, furniture firms, clothing firms, large education institutions, IT consulting firms, IT SMEs and catering businesses. The total number of businesses is 24, of which 12 are active users of Bitcoin. In addition, our sample includes 19 consumers of different educational backgrounds, between 25-60 years old. We also interviewed two Greek officials using the questionnaire items as the interview guide. The first official is a Parliamentary Member representing the governing party "Coalition of the Radical Left" (also known as SY.RI.ZA.) and the second is a Minister Secretary General and member of the government.

All participants to the study were informed with regards to the content and research questions of our study. Further, the participants were guaranteed that their data will be kept confidential throughout the study and that they could withdraw their participation at any given moment

## **4 Findings and Discussion**

Our study took place during the spring of 2017. This is particularly important as capital controls were still in place across the Greek banking system. When these residency-based restrictions were first introduced, there were daily and monthly limits on the volume any given individual or business could withdrawn from the banking system. Gradually, these measures relaxed considerably to exclude Greek citizens living abroad, businesses transacting with foreign business etc., without having to receive special permission for their daily needs. However, consumers were still experiencing the effects of capital controls and there were no credible forecasts as to when they would be lifted.

Within this context, Greek citizens, national media and online news outlets and blogs began exhibiting an increasing interest for the Bitcoin, especially as uncertainty was rising during the Spring and Summer of 2015 and when capital controls were first imposed. As many businesses and consumers started looking for ways to receive goods and services from abroad, new businesses were established with the aim to facilitate the payment process using bitcoins (e.g., Karas, 2015). In addition, the growing distrust towards the banking system and the government, and the prior experience of the Cypriot deposit haircut added to the general sense of insecurity. In fear of losing funds, several depositors opted to exchange some of their euros for bitcoins using online exchanges or Bitcoin ATMs, which led to a 500% increase in bitcoin use in Greece between mid June and mid July (Mount, 2015). Since then, several more business began accepting bitcoins as payment for their products or services.

Proceeding with the presentation of findings from our survey study, most of the businesses that participated were established more than 10 years ago ( $n=10$ ). Five of them were established between 6 and 10 years ago, four of them between 2 to 6 years ago, and five of them are fairly young, having been established less than two years ago. When asked regarding the preferred way of payment of their clients, 41,67% ( $n=10$ ) of them responded that their clients still preferred to conduct cash-based transactions, and 58,33% responded that their clients preferred electronic payments. On the one hand this is surprising considering that the availability of cash is limited due to the limits in withdrawals as a result of the capital controls. On the other hand however, the Greek society at large operated largely in cash anyway. Further, when prompt with regards to the frequency of use of e-banking, our findings further confirm an overall hesitation to use e-banking as 29.17% of businesses and 21.06% of consumers responded that they make rare or no use of it (Table 1). The extreme majority however considered that since the implementation of capital controls, electronic payments of any kind (including PayPal, credit cards etc.) have increased (91.67% businesses and 100% consumers).

How often do you use e-banking?	Businesses (N=24)	Consumers (N=19)
daily	33.33%	15.79%
often	37.50%	63.16%
rarely	29.17%	10.53%
never	0.00%	10.53%

Table 1. *Frequency of e-banking use.*

The next section of our survey had to do with capturing participants' perceptions regarding the use of the Bitcoin as an alternative payment method and as a technology that can provide opportunities for supporting innovation and new business ideas. In the next section, we therefore sought to understand our participants' overall attitude towards the financial crisis in relation to other transaction methods (not restricting this to the Bitcoin). More than half of them responded that they consider the financial crisis to give rise to alternative payment methods (Table 2). However, very few of them have actually used cryptocurrencies in the past (of any kind) for their transactions (25% of the businesses and 5.27% of the consumers, Table 3).

The financial crisis can give rise to alternative payment method	Businesses (N=24)	Consumers (N=19)
Definitely	16.67%	5.26%
Quite possibly	58.33%	52.63%
No	8.33%	10.53%
I don't know	16.67%	31.58%

Table 2. *Rise of alternative payment methods*

Have you transacted in the past using cryptocurrencies?	Businesses (N=24)	Consumers (N=19)
Yes	25.00%	5.26%
No	75.00%	94.74%

Table 3. *Previous experience with cryptocurrencies*

One explanation for the low level of diffusion of actual Bitcoin-based transactions could be a general low of knowledge with regards to the technology itself. As shown in Table 4 this is most probably not the case. Understandably, none of our participants felt that they hold expert knowledge on Bitcoin, but taking together those who consider themselves as "very knowledgeable" or "knowledgeable", then our findings show that, particularly in the case of businesses, more than 50% (54.17%) of them and 21.05% of consumers are knowledgeable enough. As far as businesses are concerned, however, this

finding should be interpreted with a bit of salt as several of them are active within the sector of IT, and therefore are advantageously positioned.

How much do you know about cryptocurrencies?	Businesses (N=24)	Consumers (N=19)
I am an expert	0.00%	0.00%
I am very knowledgeable	16.67%	5.26%
I am knowledgeable	37.50%	15.79%
I know a little	41.67%	5.26%
I don't know anything about cryptocurrencies	4.16%	26.32%

Table 4. Perceptions regarding personal knowledge on cryptocurrencies

One of our main interests was examining consumers' and businesses' perceptions regarding their experience with the Bitcoin. In turn, if they had never used bitcoins in the past, we were interested in knowing the reasons for not having transacted using the technology, assuming they had some knowledge about it. Of those businesses (n=6) and consumers (n=1) who had used in the past bitcoins in their transactions, all of them responded that they had successful transactions but were not using the cryptocurrency often. Of the remaining participants who have never transacted using bitcoins, 50% of the businesses said that they never had the opportunity to conduct such transactions, and more than 50% of the consumers responded that they don't know how to conduct them (Table 5).

Why haven't used the Bitcoin so far?	Businesses (N=18)	Consumers (N=18)
I didn't have the opportunity to conduct such transactions, but I'd like to	50.00%	33.33%
I don't know how to conduct such transactions	33.33%	55.56%
I don't trust these transactions	16.67%	11.11%

Table 5. Reasons for not having used Bitcoin in transactions

Next, we examined perceptions with regards to the potential of the technology in supporting business ideas, and whether participants were aware of the risks involved in using Bitcoin. These findings are summarised in Table 6 and Table 7. What this part of the survey revealed is that both consumers and businesses are aware of the technology being used or having been used in the past for fraudulent activities, such as money laundering, which possibly urges them to consider the technology as less secure or that there are security issues with using it. Therefore, most probably, they consider these security concerns enough to obstruct further diffusion and adoption of the technology.

	completely agree	agree	neither agree, nor disagree	disagree	completely disagree
Cryptocurrencies can be an alternative form of payment, especially during capital controls	8.33%	41.67%	37.50%	12.50%	0.00%
Cryptocurrencies can be used for money laundering	20.83%	50.00%	29.17%	0.00%	0.00%
There are security concerns with using cryptocurrencies	4.17%	66.67%	25.00%	4.17%	0.00%
In the future, cryptocurrencies will be	16.67%	16.67%	50.00%	16.67%	0.00%

integral for everyday transactions					
Cryptocurrencies can support new business opportunities	8.33%	29.17%	54.17%	4.17%	4.17%
Cryptocurrencies can support innovative business ideas, particularly in the IT sector	16.67%	41.67%	37.50%	4.17%	0.00%
Security concerns are impeding further adoption	20.83%	50.00%	16.67%	12.50%	0.00%

Table 6. *Businesses' perceptions regarding Bitcoin*

	completely agree	agree	neither agree, nor disagree	disagree	completely disagree
Cryptocurrencies can be an alternative form of payment, especially during capital controls	5.26%	36.84%	47.37%	10.53%	0.00%
Cryptocurrencies can be used for money laundering	21.05%	36.84%	26.32%	15.79%	0.00%
There are security concerns with using cryptocurrencies	0.00%	52.63%	42.11%	5.26%	0.00%
In the future, cryptocurrencies will be integral for everyday transactions	0.00%	36.84%	52.63%	10.53%	0.00%
Cryptocurrencies can support new business opportunities	5.26%	52.63%	36.84%	5.26%	0.00%
Cryptocurrencies can support innovative business ideas, particularly in the IT sector	5.26%	52.63%	36.84%	5.26%	0.00%
Security concerns are impeding further adoption	0.00%	57.89%	31.58%	5.26%	5.26%

Table 7. *Consumers' perceptions regarding Bitcoin*

What is interesting, however, is that despite any concerns they have regarding security aspects of the technology many of them consider that future payment systems will be using in some way cryptocurrencies. Also, our participants view the Bitcoin technology supportive of new business ideas and innovative concepts.

As mentioned elsewhere, one of the reasons we consider as an impediment for the further proliferation of the Bitcoin is the lack of regulation. This allows on the one hand illicit trading and fraudulent activities to take place through the Bitcoin network, which further affects user perceptions. On the other hand, in light of a general lack of regulation, businesses may choose to avoid the overall uncertain and insecure environment and look for other investment opportunities. When examining the perceptions of the participants regarding the role of the Government in this context, our findings show that 57.9% of consumers and 41.66% would like to see the Government regulating the cryptocurrency environment (Figure 1). Drawing from Figure 2, we see that consumers are almost evenly split, whereby 47.37% of consumers consider the government able to actually regulate around the use and ownership of cryptocurrencies and 42.11% don't have a strong opinion regarding this. Businesses appear to be less trustworthy regarding the government's abilities, although there is a somewhat similar trend; namely, 41.67% believe that the government has the necessary abilities to regulate, 37.50% exhibit a neutral stance, however 16.67% consider the government unable to issue a relevant regulation.

In closing, we will briefly present findings from the interviews conducted with two Greek Officials. We chose to interview them on the basis that cryptocurrencies interact with the economy, which influ-

ences and is influenced by politics and the policies decided and implemented by governments. Having said that, the period of our study was strongly influenced by financial and political turbulence across the country.

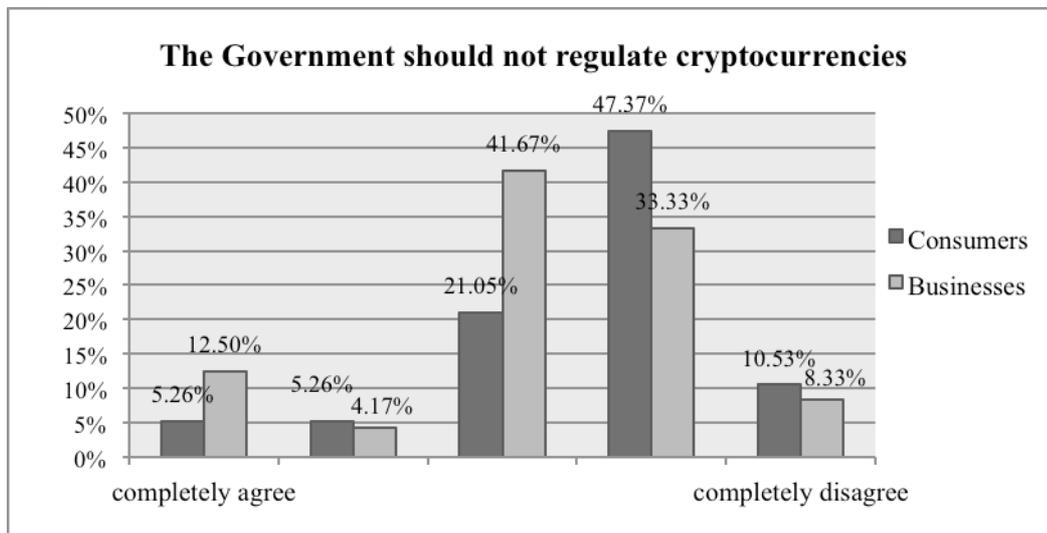


Figure 1. Perceptions regarding Government’s intervention in regulating Cryptocurrencies

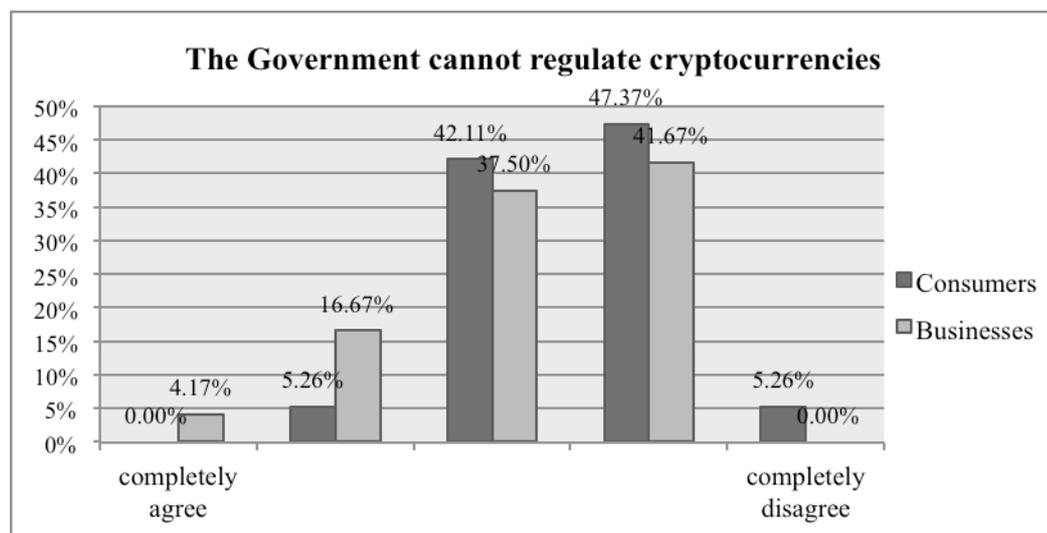


Figure 2. Perceptions regarding Government’s ability to regulate Cryptocurrencies

It is of particular interest to examine the views and opinions of these two officials as far as the role of cryptocurrencies in supporting entrepreneurship and innovation. Along these lines, one thing is of note; the opinions and views of the two officials are completely aligned across all the points raised during our communication. Both of them suggested that following the 2015 events, before and after the implementation of capital controls, the use of electronic transactions increased significantly, with e-banking being in their understanding among the main forms of payments. As far as cryptocurrencies themselves are concerned, they admitted that their knowledge regarding the matter is relatively scarce but they noted they knew a few things about the technology. Following from this, when asked if they’ve ever transacted using cryptocurrencies, and bitcoins in particular, they responded that they hadn’t due to not knowing how to complete such a transaction.

We queried them regarding the role of cryptocurrencies in the economy in general. They see cryptocurrencies to support in the future an alternative economy, and possibly being centre stage in our future transactions. Within this context, they agree with businesses and consumers that cryptocurrencies

can be particularly valuable for new and extant businesses because they can support entrepreneurial activities and innovation and commented that they see the technology as most helpful within the field of network technology. In closing, regarding the government's role in regulating cryptocurrencies, expectantly perhaps, they both responded that the government needs and is able to regulate the landscape; with the Minister Secretary General's response being more definitive.

## 5 Conclusions

Technological advancements have made possible a cashless environment, where transactions take place with the use of debit and credit cards and other forms of online payments. Most importantly, this environment is usually thought to be secure and easy to navigate, even when the user is considered a laggard in adopting a new technology.

Cryptocurrencies promise to revolutionise payments once more. Made possible by encryption techniques, the Bitcoin offers a transparent policy that is accessible by all the peers of the network. In this sense, verification and authentication of any all transactions can be done without the need for a central regulatory body. However, it is uncertain whether this information can be easily processed by the layperson. Moreover, assuming that the aim is for Bitcoin to eventually be accepted for regular transactions, there is a need for a greater adoption of the currency by both end users and businesses.

Our study took place in Greece when residency-based measures were still in place, restricting the unlimited withdrawals from the Greek banking system. Since capital controls were imposed, many individuals turned to the Bitcoin technology for their everyday transactions with businesses and individuals residing abroad, or simply out of fear for an imminent deposit haircut. In doing so, awareness regarding the technology has increased but adoption remains low. While users exhibit a vivid interest, they don't necessarily trust the technology, possibly because they are still not acquainted enough with how transactions take place, how these get verified and validated and so on and so forth.

Along these lines, we posit that the focus should not be aimed at if and how the Bitcoin protocol can be used for illicit activities, such as money laundering and the likes, but rather increasing awareness on the underlying technologies that make Bitcoin, and other altcoins, possible. These would include the blockchain, i.e., the distributed ledger technology that is used for maintain any and all records of all transactions across the network, and smart contracts, i.e., self-executable software that is embedded in the blockchain and can facilitate the development of a number of other innovative applications. This way users will be able to appreciate the security and anonymity provided by the technology, what is meant by irreversibility and how double spending is completely avoidable. Most importantly, we consider that users, i.e., consumers but most importantly businesses, will be able to grasp the numerous opportunities for developing new business scenarios building on the Bitcoin technology and the blockchain, increase their level of innovativeness, and propose new entrepreneurial models. In other words, attention should be paid in how technologies like the Bitcoin can enable decentralized trusted peer-to-peer transaction ledger systems and applications, such as the blockchain (Giaglis and Kypriotaki, 2014) and help develop sustainable business models (Wörner et al., 2016). This will support developmental efforts, which are particularly needed to overcome the still present financial crisis. As Worner et al. (2016) show, many firms already leverage this new type of money to innovate, and in doing so, they create new markets and even remove intermediaries, such as central authorities from the picture.

### 5.1 Limitations

Our study comes with some limitations. First of all, the sample to our study is particularly small and comprises of both individual consumers and businesses; our aim was to distribute the questionnaire to individuals who have used the Bitcoin or have heard of it in the past, which limited us considerably since the technology doesn't experience wide adoption at the moment. It also means that there are different levels of analysis. Second, our questionnaire was kept purposefully short which entailed that concepts such as security were not further unpacked that could allow us to assess consumers' percep-

tions. In addition, the two officials who participated in our research belong both to the governing party and preferred to remain anonymous. In an alternative scenario, whereby their names could be identified, we could be more confident that the official position of the government is similar to their own expressed views through this study. Last, but not least, our study was designed as an exploratory one; therefore, our focus was to capture perceptions and attitudes in an effort to understand the level of adoption of the Bitcoin technology, rather than examine correlations and causality relationships. This also means that the findings reported are the result of a descriptive rather than of a more in depth analysis.

In a future study, we consider that all these issues can be easily tackled. Since research at the individual level is rather scant, we envisage that a purely qualitative study, focusing specifically on the consumer rather than the business level, can be most beneficial because more concepts and the relationships between them can be examined (e.g., privacy concerns and their importance over payments ease of use), since the researcher can prompt the interviewee for additional information, and concepts and emergent ideas can be unpacked and further scrutinised.

## 5.2 Future Research

We consider that despite the Bitcoin's current market valuation, there are many obstacles for its full use as an alternative payment mechanism. The technology itself and the industry structured around it need to overcome them so that both the Bitcoin, or other cryptocurrencies, and the underlying technologies, i.e., distributed ledger technology and smart contracts, can meet their full commercialisation. It would thus be interesting to investigate further along this dimension and to examine whether and how these obstacles can be lifted. Another direction for future research would be to delve deeper into consumers' trust and risk perceptions and investigate whether these are similar or inherently different from the perceptions they hold towards fiat currencies. Findings from such a study can be particularly useful as they could push adoption further, putting fiat and cryptocurrencies on a more equal footing.

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