HOW DO YOU DO MONEY LAUNDERING THROUGH BITCOIN?

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DEGREE: FINANCE AND ACCOUNTING

ACADEMIC YEAR: 2015/2016

JEL CLASSIFICATION: F38

ABSTRACT

In recent years there has been an increase in money laundering due, in part, to new digital resources like the bitcoin. The bitcoin is a decentralized electronic coin created in 2008. It is considered the most used method on line to launder money. This is because there is not a central server doing the transactions per-to-peer, and these are anonymous. It is important to note that the issue of bitcoins is limited to 21.000.000 units. Some of the ways used to money laundry are the mixers, Deep Web, and others.

Finally to indicate that money laundry has different phases such as the placing, stratification, and investment, before getting into the financial system illegally. Unfortunately, the current legislation is poor in this matter. Although, we can find the following legislation, in article 301CP, the 2006/112/CI Directive of the Counsel, plus one of the LPBC. Even though the legislation is scant, there are some bodies working on the prevention of money laundering, like FATF and SEPBLAC.

KEYWORDS: money laundering, bitcoin, blockchain, miners, anonymous, peer to peer, wallet, Deep Web.

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ABBREVIATIONS

BTC: Bitcoin

P.C: Penal Code

EU: European Union

FATF: Financial Action Task Force on Money laundering

FBI: Federal Bureau of Investigation

FIU: Financial Intelligence Unit

IMF: International Monetary Fund

GCC: Cooperation Council for the Arab States of the Gulf

IBAN: International Bank Account Number

IP: Internet Protocol

IRS: Internal Revenue Service

VAT: Value-Added Tax

LPBC: Ley de Prevención del Blanqueo de Capitales y de la Financiación del Terrorismo

P2P: Peer-to-Peer

PIN: Personal Identification Number

POS: Point of Sales

SEPA: Single Euro Payments Area

SEPBLAC: Servicio Ejecutivo de la Comisión de Prevención del Blanqueo de Capitales e Infracciones Monetarias

SWIFT: Society For Worldwide Interbank

ECJ: European Court of Justice

TOR: The Onion Router

UN: United Nations

USD: United States Dollars

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1. Introduction

Money laundering is big news nowadays due to the Panamá Papers, concerning offshore firms and the political parties corruption. Money laundering is being laundered a lot thanks to a fast growth that the new technologies are having. Criminals benefit from these sophisticated technologies using the internet for their anonymous financial operations. New virtual coins, like the Bitcoin, in use since 2009, are very attractive for users because of their deep cryptography, as part of a decentralized system – it is not answerable to any central institution nor any government or financial body. For this, the present research is focusing on how can it be possible to laundry large amounts of money with Bitcoin being in use so recently and being scarcely known.

Although it is questioned that the bitcoin is an anonymous currency as we will see all through this Project, it is difficult to detect the person that has performed a transaction as long as the individual takes care in doing the operations correctly.

The development of this work is composed of 7 interrelated parts.

In the first place, the concept of money laundering is considered, along with the procedure practiced to carry out the operation that it consists of three different stages: placement, stratification or transformation, and investment or integration.

The next epigraph is about the legislation making reference to the article related to money laundering on the one hand and the normative that the European Union has been able to apply in relation to the virtual currency Bitcoin. Moreover, a practical case is attached regarding the ruling of the Provincial Court of Asturias regarding Meetpays S.L and Caja Laboral for the breaking of a contract service in the buying of bitcoins.

After that, in epigraph 3, different intergovernmental bodies are presented, which have the job of preventing the making of operations of money laundering. These are the Financial Task Force on Money Laundering and the Executive Service of the Commission for the prevention of Money Laundering and Monetary Irregularities (SEPBLAC).

After this, in epigraph 4, the Bitcoin is introduced. In the first place a description and origin of the bitcoin is made. The next part refers to its functioning, in which the osers of the Bitcoin belong to a peer-to-peer network, where all transactions are left registered in the blockchain. Next, it is spoken of the mining process, that through cryptographic interventions the miners verify the transactions produced and they are validated if they have been done correctly. In another section all the ecosystem belonging to Bitcoin is analyzed, although there must be taken into account that it is based on a specific day and the bitcoin is very volatile coin. Finally, to end this epigraph it has been done a small analysis of the markets that operate using the bitcoin in relation to the different currencies. I consider this to be the most complex point due to the poor familiarity with the computing vocabulary being spoken of.

Later on, in epigraph 5, three reasons are explained for which it is said that the Bitcoin is 'anonymous'. However, several investigations done contradict this.

In epigraph 6, different methods of money laundering using bitcoins are presented. For this, it is referred to a theoretical description of concepts and several examples of real cases have been presented, that explain the different ways of doing this. Moreover, it is commented what is Deep Web and the Silk Road black market.

To end, several conclusions have been elaborated about the Project and the future topics of study that are encountered in epigraph 7.

This work has become more difficult due to the lack of reliable information encountered currently on the internet

1.1 Methodology

In this section it is described the methodology that has been used in the making of the final Project of the degree.

To carry out this investigation in the first place a basic information about money laundering has been presented and the preventing agencies to avoid this to occur.

Later, a study about the characteristics and functioning of Bitcoin has been used. Lastly, a study about some of the techniques that have been used to launder money with bitcoins adding some examples.

For this a cabinet investigation has been done, which using secondary sources such as journal articles, specialized pages on bitcoins, papers and other documents it has been possible to obtain the necessary information for its writing. It is worth pointing out that any person can access to this type of information at any time and from anywhere.

2. The concept of Money laundering

Money laundering is a concept that refers to the integration of money or goods into the legal economic system coming from illegal means, although appearing legal and introduced through different methods (Tondini, 2006).

2.1 Money laundering process

Money laundering has different phases before getting integrated and finally deposited as part of the legal financial system. Their names might vary according to different expert jurists, but almost everyone indicates three main stages – placement, stratification or transformation, and integration or investment of funds (Tondini, 2006). Thus, the procedure through which money laundering is done is the following:

- Placement Stage: it is the first step within the money laundry process, here the illegal funds are being introduced into the economic system (Tondini, 2006). It is considered the most complicated stage (Brot, 2002) and it is usually done by agents outside the criminal organization.
  In this stage cash funds are deposited in different easy bank accounts with several names; money is also converted to metals or precious stones. Other business that might laundry money are casinos, restaurants, hotels, night business.

- Stratification or transformation Stage: in this stage it gets more difficult to detect the laundering. Money is transferred from one bank account into another, from one business into another, or direct to tax havens – both in cash and electronic means – this way makes it difficult to control and finding its origin (Brot, 2002). The objective of this second stage is to acquire assets and to transform them as

if they were legal (Tondini, 2006). Here it is worth mentioning that money is moved very fast and it normally ends up in an off shore deposit or tax haven for the money to circulate within different countries and institutions. According to the Financial Action Task Force on Money Laundering (FATF) the most important means in the transferring of money is by electronic means.

- Integration or Investment Stage: in practice, this last stage is the most difficult to detect. Illicit activities are already part of the economy and appear legal, thus they become normal (Tondini, 2006). Once the launderers reach this stage it is very difficult to notice legal funds from illegal funds, for they are mixed.

These secret activities make it difficult to be detected on time, moreover banks have an information confidentiality clause that turns difficult any detection of illegal funds.

3. Spanish legislation

3.1 Article 301 of the Penal Code

This article 301 of the Spanish Penal Code (P.C.) states that whoever that *"acquires, possesses, uses, converts, or gives goods, knowing they come from an illegal activity, by hi more any other third person, or does any action towards its hiding or covering its illicit origin, or to help to any person that has taken part on any infringement or infringements to evade the legal consequences of their own acts, will be penalized with six months to six years of prison, and a fine triple the value of the goods. In such cases, judges or the courts, according to the gravity of the facts and personal circumstances of the individual criminal, will be able to dictate a special fine disqualifying this individual for performing their profession or business from one to three years, and to set a measure to provisionally or definitely closing the establishment or local. Five years maximum for a temporary closure. If the activities are due to a gross negligence, there is a period of between six months and two years of imprisonment and a fine triple the amount involved. The guilty part will equally be punished, even though the goods, or the activities punishable, were totally or partially had taken place abroad. Any earnings will be decommissioned"*

3.2 Normative related to the bitcoin

European Union (EU) legislators and governments have not yet applied any clear law regarding the business done with bitcoins and other crypto-exchange. There is no clarity in the existing law, there are doubts about creating a new normative. This is something to be solved.

Currently, the European Union (EU) has only applied the following norm:

In Bitcoinchaser (2016) is mentioned that The European Court of Justice (ECJ) declared, on 22 October 2015, that both sales and purchases with bitcoins would be exempt of VAT within the European Union countries. Thus, bitcoins get the same status as do the traditional foreign exchange traditionally encounter in the article 135, block 1, letters from d) to f) pertained to Directive, 2006/112/Counsel, 28 November, 2006.

3.2.1 Case Study: Asturias Provincial Court Ruling, 6 February 2015

This ruling refers to a Company called Meetpays, S.L which offers services to buy bitcoins directly and a credit Company called Caja Laboral Popular Cooperativa de Crédito. Both sign a contract in relation to the system of cards Visa and Mastercard, to install a Point of Sales (POS).

In the ruling we can see that Meetpays had sued Caja Laboral for contract infringement because this service *"could have been used to pay with bitcoins all over the world in a free and anonymous way from a computer or from a mobile phone"*, being *"impossible to verify the legitimacy and the origin of the funds"* in an activity*,* "of high risk, being the concerned authorities preoccupied with this coin", that could be used for "*the laundry of money coming from drug trafficking and others".*

This ruling was based on the LPBC article 16. This establishes that the financial institutions must have a comprehensive control and attention to any risk of money laundering coming from products or operations propitious to be anonymous or from the new technologies. This ruling calls for the attention to who obtains the funds as much as the legitimacy and authenticity of the funds to avoid any anonymity.

On the other hand, it is based on article 7.3 of the same LPBC, the concerned subjects, in this case the financial institutions will no enter into any transaction nor any business if this law cannot be applied. Thus, these institutions must comply with the law.

According to the court ruling in case, the origin of the funds through which bitcoins are obtained, it is not considered "*more unclear than any other internet transaction with a credit card*" but "*what it is not taken into account is that in this case the objective of the sale are the bitcoins*", what could represent a risk for the laundering of funds coming from illegal activities.

Finally, I have to say that the mentioned ruling did not accept the demand that Meetpays had made.

This ruling message is that everyone trading and inter exchanging bitcoins in Spain must abide the LPBC, at least in a voluntary way.

4. Institutions for the prevention of money laundering

4.1 Financial Action Task on Money Laundering (FATF)

This institution was created in Paris in 1989 by de Group of Seven. The purpose was to avoid money laundering by Banks and Financial institutions, coming from illegal activities, such as the selling of illegal products and the manipulation of markets (Quirk, 1997). Currently, the FATF has 34 countries, plus two regional organizations, the Cooperation Council the Arab States (GCC), and the European Council, plus eight associated members and 25 international organizations, among them the following stand out, the IMF, the World Bank, and the UN.

FATF is thus an independent intergovernmental institution promoting and developing policies for protecting the financial institutions of money laundering, the promotion of terrorism and the financing of arms of mass destruction (GAFISUD, 2012).

According (FATF, 2014) IN Virtual Currencies report, defined as virtual currency that "*is a digital representations[1] of value that can be digitally traded and functions as a medium of Exchange, or a unit account and a store of value, but does not have legal tender status in any jurisdiction".*

So I can conclude by this definition that Bitcoin can't be considered legal tender.

This report (June, 2014) it also states that the Bitcoin can be related to money laundering because is a risk product.

4.2 Commission Executive Service for the Prevention of Money Laundering and Monetary Infringements (SEPBLAC)

According to the Bank of Spain the SEPBLAC is "*the Spanish Financial Intelligence Unit (FIU), it is one of the bodies for the prevention of money laundering, responding to the Secretary of Economics. Its role it is to prevent and impede the use of the financial system, business and professionals for the laundering of money. It also investigates and prevents bureaucratic infringements of the legal regime through funds and financial transactions abroad".*

SEPBLAC is run by inspectors of the Bank of Spain, of the Finance Ministry and by Customs inspectors. The Police General Directorship runs the Investigative Brigade for Monetary Crimes, and the Unit for Investigating is run by the Civil Guard (OroyFinanzas, A 2015).

In relation to the Bitcoin, whoever uses Bitcoins for buying or exchanging bitcoins must apply preventing measures for the prevention of money laundering, and to contact the SEPBLAC in case of any incidence; some internal channels of complaints might be established too (OroyFinanzas, B 2015).

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[1] A bitcoin might contain a digital representation, but the currency only function if it is linked digitally, via the internet, to the virtual currency system.

5. The Bitcoin

5.1 How was the Bitcoin born?

Satoshi Nakamoto, an alias, invented the Bitcoin in 2008. A year after Bitcoins started to be used as payment currency on line.

According to Newsweek (2014), the famous creator of the virtual money Bitcoin, Satoshi Nakamoto, an American-Japanese, and a humble person, was fed up with the commissions he had to pay when buying toy trains, his great hobby. So he invented this virtual exchange coin, which is more and more known in all the world. Nakamoto's only words on the bitcoin were: "*I am not involved on this anymore, so I cannot talk about it. It has been transferred to other people. They are running it now, I don't have any connection*".

But according to El País (2016), it is revealed that 'the creator of the Bitcoin is an Australian entrepreneur'. His name is Craig Steven Wright, and has admitted to act with the pseudonym of Satoshi Nakamoto to the BBC, The Economist and to the GQ. To confirm all of this, he announced the private codes used to carry out the first transactions with the mined coins Bitcoins, in January 2009, using the name of Satoshi Nakamoto, so not one else could have them except Satoshi himself.

Since the moment of its operations, this virtual currency obtained a lot of followers because of the fact that it did not depend on any bank, nor on any government, and could be used all over the world. Moreover, people could save costs on the transactions originated by the banks as intermediaries in the traditional way (López, 2015).

5.2 What is the Bitcoin about?

Cinco Días (2013) in an article stated that the Bitcoin (BTC) is a decentralized electronic coin, for it does not depend on any central server to perform transactions on a peer-to-peer[2] network.

Each bitcoin has a unique serial number, thus it cannot be confused with any other number, similar to the bills and coins in use by the Banks – so there are no two bills with the same code number

It is to be considered that Bitcoin, with a capital B, refers to the system or the peer-to-peer network (p2p), and bitcoin, (in lower case), refers to the electronic generated coins (Pagliery, 2014). Thus, it is said, 'I want to obtain 300 bitcoins', or 'I am learning about the Bitcoin protocol'.

A bitcoin, due to its digital nature, can be divided in up to 8 decimal figures (Tupin, 2014). Thus, the minimum quantity of bitcoins available is 0.00000001 bitcoins, which is a 'Satoshi', after its creator (Kerscher, 2013).

The following, Table 1 indicates the possible parts of one bitcoin:

Table 1: Names of each bitcoin part

1 BTC	0.01 BTC	0.001 BTC	0.000001 BTC	0.00000001 BTC
A bitcoin	A bitcent	An mbit	A ubit	A satoshi

Source: Kerscher, (2013).

Presently the BTC is a financial good with similar monetary properties to a foreign Exchange currency, this is not saying that in a future time it might obtain a *"negotiable value"* (Navarro, 2015).

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[2] A peer-to-peer network has several computers, nodes, behave similarly between themselves. This allows for the interexchange of information between the simultaneously connected computers, without the need for an intermediary central computer (OroyFinanzas, A 2014).

5.3 How the Bitcoin works

According to Cárdenas, Avellaneda and Bermúdez (2015), to be able to operate with bitcoins one has to download on a computer or a mobile device a virtual wallet. This is digital encrypted file composed of a series of exclusive codes; nowadays, there are also many more ways to download this file.

Once the wallet is downloaded, a bitcoin address is given. This is a large alphanumeric sequence in two related parts within the network system. One part contains the private code for the wallet for each individual subscriber, and there is an account to access to and dispose of any funds they might have in their virtual wallet – it is similar to a credit card PIN number. In case it gets lost, it cannot be used again; which makes it an important element of the wallet itself.

The other part consists of a public address, here the individual identifies herself to other users, it is similar to the IBAN of bank accounts.

There are two ways in which to safe these codes, which are explained very briefly now. One way is 'the cold wallet', through which the keeping of the codes is done by using it without any connection to internet. It is a safer way than the following one. The other medium is through 'the hot wallet': where either addresses or codes can have a direct or an indirect link to the internet. Although it is more simple and easier than the first way, it is also less safe, having a higher computing risk than the other one. Usually, 'a hot wallet' is used for the transactions, with few funds. And 'the cold wallet' is used to keep larger funds kept in a more secure way (Bitcoinrealidad, 2014).

For transactions of bitcoins between users, the ones getting the bitcoins need to send their public codes to the other users to be transferred. The ones transferring the coins must sign with their private codes. Once this is done so, the transaction is launched to be issued at the nodes[3] of the peer-to-peer (p2p) Bitcoin.

After all of this is done, the transaction will be verified by the miners of the network. These miners transform the information sent to the net into an alphanumeric sequence.

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[3] They are computing sets where a software called Bitcoin Core is downloaded. Once this is done, the computer can be operative within the P2P network of the Bitcoin. Depending on each different function to be engaged, each node will behave one way or the other. There are several functions which the nodes perform: in the data base of the blockchain, in the virtual wallet, mining and relay (OroyFinanzas, C 2014).

This is a digital signature[4] and it has an established time, and at the same time it performs a cryptographic role. This is known as the Bitcoin hash (SHA-256), which changes the entering data coming from any length into bits of a fixed length on exiting. There never can be the same chain of exiting (Cárdenas, Avellaneda & Bermúdez, 2015). This is one example: 'hdgjhasgaq564o3492rhoweq5987e9q3i9idtq53478r48h87t5685y8y6it'.

Figure 1: Digital firm
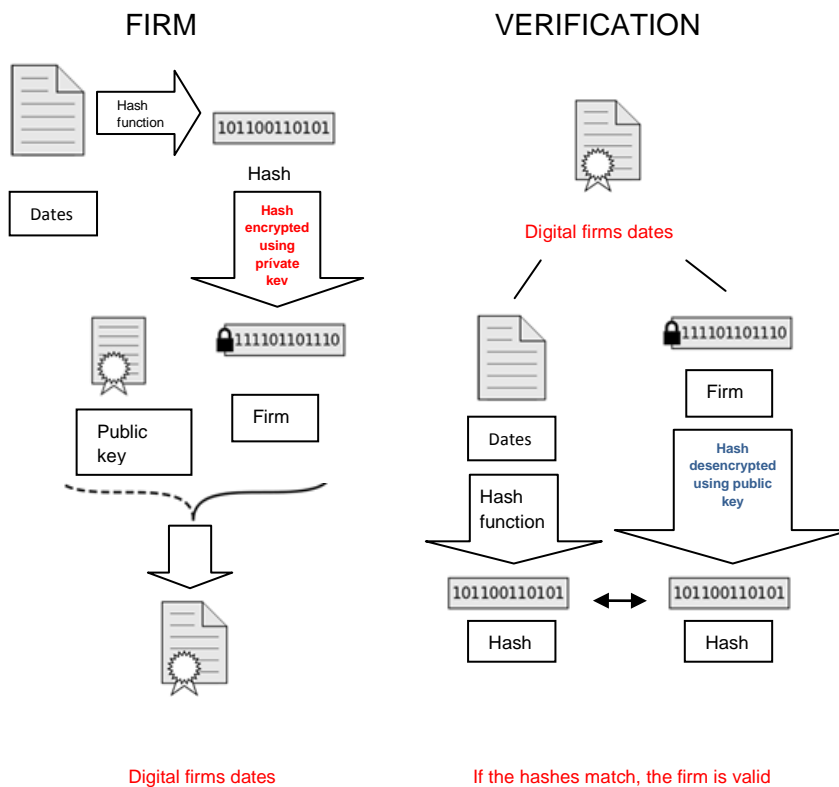
Source: BTC Y NXT ejemplos (2013). Own work.

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[4] It is used in the interexchange of the payment between the sender and the recipient of the transaction, where the recipient of the bitcoins authenticates that the message comes from the sender. Furthermore, it is so secured that the sender does not withdraws from the operation and that the message cannot be manipulated by others. It has to be said that the hash along with the private code are the digital signature, which will be given along with the public signature. If the hashes coincide at the time of the verification, the signature will be given as valid (Cárdenas, Avellaneda & Bermúdez, 2015).

5.3.1 The mining process

In the world of the Bitcoin, mining refers to a dual process: the verification of new transactions taking place to avoid fraud, and the emission of new bitcoin coins.

It is important to point out that the monetary supply of Bitcoins is diminishing. According to (Rose, 2015), the emission of bitcoins is limited to 21.000.000, so once this amount is reached it would not be possible to have more. Thus, it is a finite good, quantifiable, which flow cannot increase nor diminish.

The process itself validates the new transactions, and once they are verified they are recorded in the blockchain. Each set of new transactions form a new block, which is being registered. Then they are confirmed within the next ten minutes since the last block was registered. This is done to avoid any change to the previous block, for if there is a change all the following block would be invalidated (Coincenter, 2014).

A blockchain is the most important element of the bitcoin, for here are stored all the previous transactions – its history – since the beginning of this virtual coin use. Thus, it is possible to determine the amount of bitcoins that have been deposited in the wallets in chronological order. It is the account book of the Bitcoin.

The miners, before recording and validating the operation in the blockchain, must take into account the dual expense of coin falsification (OroyFinanzas, B 2014), so the solution is to account for all the transactions, and to verify that those bitcoins being used have not already been used in other operation. This way, if an individual tries to operate with already used bitcoins, the miners will verify in the blockchain that have already been used, and they will be invalidated.

According to (Cárdenas, Avellaneda & Bermúdez, 2015), and (Coincenter, 2014), once the transactions are validated, the bitcoins are assigned to several public addresses. Each public address has got its own private code, thus only that user would be able to digitally sign the transaction application, which is formed by inputs. They are the previous operations that the user has done to do the new transaction operation.

Then, the transactions are added to a personal list that each miner has got, which has to form the block for validation. Once it is verified, the mining community will validate it too.

This block will be part of the blockchain when transactions have been validated with the right digital signature, without a dual expense and the Nonce[5] has been found trough the proof-of-work[6].

Next, the miners create hash in repetition through the signing of the previous transaction along with new transactions and Nonce estimates. Finally, one of the miners will be able to find the Nonce that will allow to know the number of zeros needed.

After this is done, the miner signs with the zeros, sends it to the net and the other miners endorse it, then this block will be validate it completely and the mining process will end. The process, of course, will start all over again.

On the other hand, the miners will also confirm the transactions pending of inclusion into the blockchain. This process protects the net, and also the state of the system can be observed too.

Finally, for carrying out this mining process a great effort is needed. This is being rewarded with bitcoins, to be generated at the same time with a previous value of 50 BTC, nowadays is 25 BTC, but it will be reduced to 12.5 BTC, within the next years until 0 BTC are generated. By then the maximum 21.000.000 bitcoins will be reached, as I have already said before (Meiklejohn, Pomarole, Jordan, Levchenko, McCoy, Voelker, Savage, 2013).

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[5] It is a random number used to establish the hash of the operation with serial zeros. A lot of nonce includes the time registration to record the exact time of the transaction.

[6] "*Involves scanning for a value that when hashed, such as with SHA-256, the hash begins with a number of zero bits". "For our timestamp network, we implement the proof-of-work by incrementing a nonce in the block until a value is found that gives the block's hash the required zero bits."* Also it use for*" solves the problem of determining representation in majority decision making"*. (Nakamoto, 2008)

Figure 2: The Bitcoin Protocol
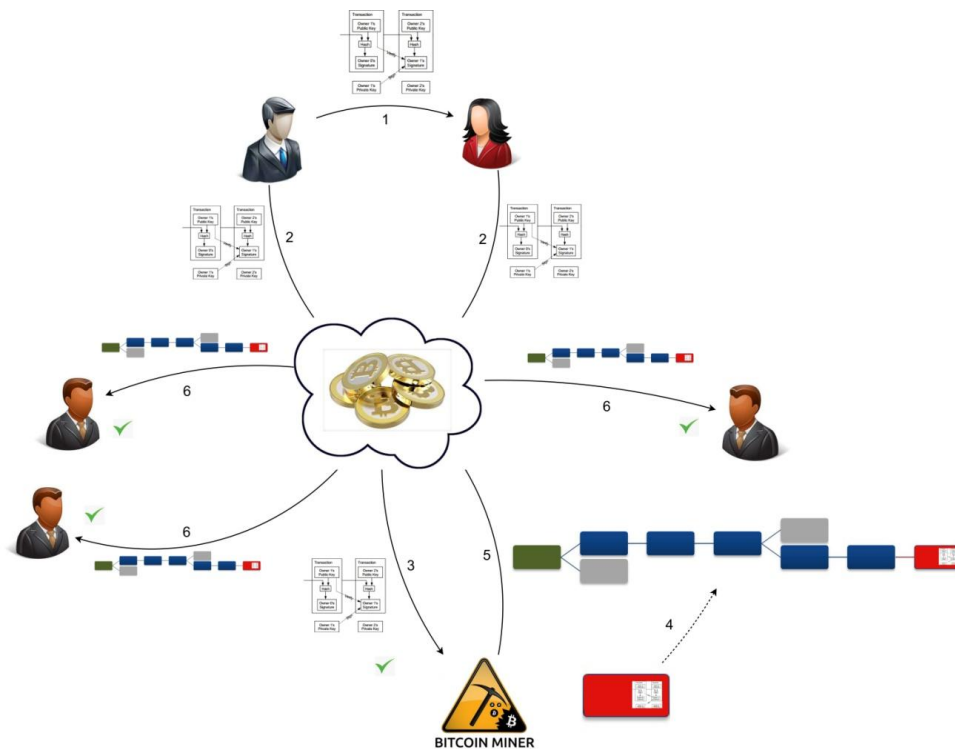
Source: National Institute of Cyber safety of Spain S.A. INCIBE (2014).

There are also other ways of obtaining bitcoins without recurring to the miners, these are the following:

- Going to a house of virtual Exchange.
- Using cash dispenses.
- Bitcoin specialized forums or even through the social networks – where people buy and sale bitcoins face to face.

5.3.2   The ecosystem of the Bitcoin

From what it has been said previously, the following Table shows data and information regarding the Bitcoin ecosystem. This information is from March 8, 2016, but data is very dynamic, and can be up dated in a few seconds.

Table 2 is divided in eight parts. The first part gives information about the Bitcoin's economy; the second part is about the blockchain; the third parts about Bitcoin's

network; the fourth part is about transactions; the fifth part is about the accounts; the sixth part is about the size of the blockchain; the seventh part is about businesses using bitcoin; and lastly, the eight part is about the mining cost.

Table 2: Statistic for Bitcoin ecosystem

	Description	Quantity
FIRST PART	*BTC ECONOMY*	
1	Total BTC	15,239,275 BTC
2	Market Capitalization based on latest prices	6,299,605,838 USD 5,699,956,525 EUR 24,775,105,500 PLN 4,435,049,750 GBT
3	Transactions (last 24h)	196, 020
	Transactions (average per hour)	8167,50
4	Bitcoins sent (last 24h)	2,343,787.17 BTC
	Bitcoiins sent (average per hour)	97,657.80 BTC
SECOND PART	*BLOCKS*	
1	Count	401,730
2	Blocks (last 24h)	136
	Blocks (average per hour)	5.67
3	Dfficulty level	158,427,203,767
	Next difficulty level (in	159,878,240,827

1470 blocks)

4	Network Hashrate (Terahash per second)	1143947.27
	Network Hashrate (PetaFLOPS)	14528130.36

NODES

Reachable nodes	7116

TRANSACTIONS

Transactions (since inception)	115,326,957

ACCOUNTS

Accounts (since inception)	6,332,423

BLOCKCHAIN SIZE

Size	61,188 Megabytes

BUSINESSES

Number acccepting BTC	>100,000

MINING COST

Total miners revenue (last 24 hours)	1,444,314.9 USD
% earned from transaction fees (last 24 hous)	1.24%

	% of transaction volume (last 24 hours)	1.21%
	Cost per transaction (last 24 hours)	7.42 USD

Source: First and Second part http://bitcoincharts.com/bitcoin/ Third part https://bitnodes.21.co/Fourth part https://blockchain.info/charts/n-transactions-total?timespan=all&showDataPoints=false&daysAverageString=1&show_header=true&scale=0&address Fifth part https://blockchain.info/charts/my-wallet-n-users Sixth part https://blockchain.info/charts/blocks-size Seventh part Cuthbertson, A. (2015). Bitcoin now accepted by 100,000 merchants worldwide.*Inter national Business Times*, *4.* Eighth part https://blockchain.info/stats. Own Work.

Table 2 shows that just over 15 million BTC have been issued. Their value is about 6.3 billion USD dollars, around €5.7 billion. Within the last 24 hours almost 200.000 operations have taken place and about 115 million since the creation of bitcoins.

The blockchain has about 402.000 blocks requiring a storage space of 61.188 Megabytes. The Bitcoin network has about 7.000 nodes, that can use the coin and activate a proof-of-work. The account numbers since the beginning is 6.3 million, and companies accepting the bitcoins exceeds 100.000.

To conclude, I will explain the section on mining cost which is a very interesting point. Within the last 24 hours miners have won almost 1.5 million USA dollars, of which 1.24% were obtained through transactions charges, the rest being the value in dollars of the new bitcoins. As all the information is very fast and can be up dated to the second, therefore it is suggested to see the indicated resources and have a look in real time.

The following graph, as it can be seen, indicates the volatility of bitcoins prices. It has to be said that from April 2015 to April 2016, that is a year period, the value of bitcoins in relation to USA dollars has been increasing, reaching its peak in December 2015 – at an Exchange rate of $465.5. But the highest point ever reached was in November 2013, with $979.49.

Figure 3: USD Price for one BTC


Source: Coindesk (2016).

5.4 Bitcoin markets

There are many ways of buying and selling bitcoins: BTCdirect is one of the most recent methods for instant payments by credit o debit card. Bit2Me has the advantage of selling bitcoins in seconds in more than 10.000 cash points throughout all of Spain, also it is possible to buy bitcoins online at one's own bank, in more than 150 banks in six countries. LocalBitcoins.com is a web site where sellers and buyers from all over the world can connect directly, it has not got commission charges unlike most web sites. It is also possible to purchase on line, but with a transaction fee. Bitcoin.de is another way very similar to the LocalBitcoins.com. Through Coinbase it is also possible to buy and sell bitcoins, although it is addressed to the sellers that are ready to accept payments in BTC and to get the money paying a commission. Cex.io is web page for people interested in the mining side of the Bitcoin. Other money transfers are Paypal, international bank transfers with SEPA, SWIFT, etc. (Brezo, 2012).

Currently, as it ca be seen in Figure 4, (BitcoinChart, B 2016[7], of the available 26 foreign Exchanges, there are 60 active markets where the USA dollar and the Euro dominate.

Figure 4: Number of active Markets in Relation to the Foreign Exchange
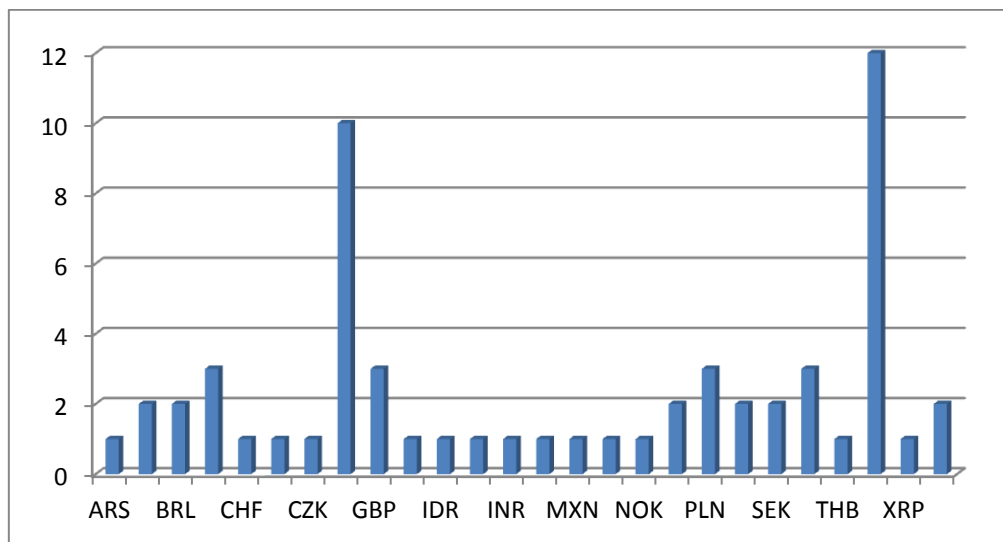
Source: Bitcoinchart, B (2016). Own work.

Unfortunately, there are almost three times as many inactive markets as there are active, in relation to the different types of foreign Exchange (Bitcoinchart, B 2016[8]).

6. The anonimity of transactions

According to OroyFinanzas (2016) there are three reasons explaining the anonymity of Bitcoin: in the first place, Bitcoin addresses are not identifiable with the personal information of individual users. In the second place, equally so with the transactions taking place within the Bitcoin network itself, for not one knows who has transferred them, as these transactions are neither identified through the personal information of the users. The last reason for which it is said that Bitcoin is 'anonymous' is related to

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[7] http://bitcoincharts.com/markets/list

[8] http://bitcoincharts.com/markets/list

the nodes, for the fact that they are connected to IP[9] addresses, this means they don't have to know in what other nodes the transactions were effectuated from.

This anonymity quality has favored Bitcoin. However, there are investigations that doubt the anonymity of Bitcoin. Sarah Meiklejohn, Bitcoin researcher at California University San Diego states: *"Bitcoin identities are thus pseudo-anonymous, while not explicitly tied to real-world individuals or organizations, all transactions are completely transparent".*

This researcher published an article about her research showing how bitcoins transactions can be tracked, even the user trading with bitcoins could known. The bitcoins privacy is a paradox, really. For all transactions are accounted for within the blockchain, besides each one is stored as an address and not with the user's name, as has been already said.

After their research Sarah's team realized that through the blockchain it was possible to know what individuals were using the addresses to perform bitcoins transactions. They confirmed and could show how through clustering[10] and 344 own transactions, it had been possible to know the owners of more than a million Bitcoin addresses. (Forbes, 2013)

To locate transactions already done, Forbes provided Meiklejohn with Bitcoin addresses from the Bitcoin wallet Coinbase, and they identified each transaction done. They also found operations done in the Silk Road, Atlantis, and the Black Market Reloaded. There was a final surprise: a Forbes reporter, Kashmir Hill, did a transfer to his own personal account.

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[9] Acronym for Internet Protocol – a non repeatable number that identifies a devise connected to the internet, for instance 155.22.212.37.

[10] According to (Berkhin, 2006), clustering is a division of data forming sets of compound objects having a similarity.

7. Money laundering methods using bitcoins

Nowadays bitcoin is the virtual currency most used on the internet for money laundering (Technoxplora, 2016). Next, in the following sections I am going to talk about some of the most common methods for money laundering by using the bitcoin.

7.1 Mixers

These are secret organizations that make it difficult for the governments in their laws against money laundering on the Bitcoin (Reid & Harrigan, 2013). They are used to mix money from one person with money from another person, so it is difficult to know what belongs to whom, or where is it coming from, as it is mixed money. This process consists on sending one's money to the anonymous service, later the same amount is returned but mixed with bitcoins from other individuals (Criptonoticias, 2016). This way, the transactions history of any client in the accounts book is hidden, that is to say the blockchain, so it becomes easier to laundry money without being detected. A 'mixer' is efficient, e.g., keeps hidden laundered money, when it has a lot of subscribers.

7.2 Deep web

Deep Web is a space of the internet including information not obtainable on other search engines like Google, Yahoo, etc. Not all its data is illegal, there can also be censored information from governments and corporations. Some illegal contains that can be obtained here are: confidential government files, drugs, arms, children pornography, hiring of killers for assassinations, prostitution, assassination videos, among other things.

ABC (2015) states that approximately 90% of internet pages are Deep Web, and the other 10% belong to the Surface net, according to experts. The next Figure shows this big difference between these two parts.

Figure 5: Surface web and Deep Web

Source: Taringa.net (2013)

To Surface on the Deep Web one needs to know the exact URL to be searched, but this is not too safe. For anonymity's sake, there are some encrypted networks for securing surfing on the net. TOR, for instance, had 2.5 million users by 2014 around the world, according to an article published by EL País, A, (2014).

To use TOR an open net is needed and a free software can be downloaded from any search engine, according to (Hernández, 2014). TOR allows and helps its users to maintain an anonymous link, when they are connected to it is not known the origin not the place of the computers being used. It works onion skin type, as its name indicates. The data of the users linked at random by IP addresses go from one level to another, from one node to another. This makes it difficult and almost impossible to detect the origin of the searches done.

But why relating Deep Web with Bitcoin? Because most of the transactions done on the Deep Web are done through bitcoins, according to an article published by (CIO, 2013).

Next, I am going to talk about some cases where money laundering has taken place using the Bitcoin:

Operation Onymous was by the end of 2014 the major operation taking place investigating drug trafficking and counterfeits black markets within Deep Web (EL País, B, 2014). 414 web pages were closed down in seven countries – in which drug trafficking, falsifications, and pederasty had been tailing place.

One of the countries was Spain, where the Civil Guard's Central Operative Unit, with the help of Europol and the USA Security Services, announced on November 11 2014 the detention in Barcelona of an Argentinian national publishing the selling of false euro notes in exchange for bitcoins.

For example, for obtaining €20 with bitcoins, the same quantity was received but paying €10. In reality the arrested person received the clients money without giving anything back. According to the Civil Guard, the arrested person had a large digital infrastructure originating Bitcoins, also there was a devise to falsify credit cards and Barcelona's public transport tickets, plus 30 blank credit cards ready to use with stolen personal data. The final result shown approximately a million euros transformed into bitcoins and €180.000 in cash.

Recently, the Dutch newspaper De Telegraaf (2016) had some news on money laundering through bitcoins in Holland. Agents of the Dutch Police arrested a total of 10 Dutch people, between 20 and 30 years of age, 250 agents took part in this macro operation. 15 places within Holland were involved, and the accusation is for laundering between 15 and 20 million euros from drug trafficking. The suspects were money laundering acting on behalf of nark traffickers, selling their goods in the black market using bitcoins.

The operation impounded luxury cars, cash, 15 kg of chemical products to manufacture ecstasies, different bank accounts, and a non disclosed quantity of bitcoins – several countries took part in this operation: The USA, Australia, Lithuania, Morocco.

The detention was made when bitcoins were converted into Euros and were transferred to a particular bank account of one of the suspects. These large amount of money were then cashed at normal cash points, this put the banks into alert and also the finances authorities.

7.2.1 Silk Road

Silk Road is the largest ever electronic black market on the net. It started in February 2011. It was created with the objective of trading worldwide with illegal products, mainly drugs, plus other goods and services. This net was inside the Deep Web and the Access was through TOR (Barratt, Ferris & Winstock, 2014).

According to an article published by ABC (2012) all users trading within the Silk Road use bitcoins as their own coin, thus there is anonymity in the transactions, although this is debatable now.

Silk Road functions as an anonymous middle man for both the buyers and the sellers, without knowing each other. This was the main purpose to use bitcoins as payment money. The buyer sends the money to the on line market place, here it is kept until the order reaches its destination by postal mail. When the buyer gets the order then the money is transferred to the seller. It has to be said that Silk Road charges a commission for this service.

Silk Road was closed down, on 11 October 2013, after the detention of its founder Ross Ulbricht. Gary Afford, an Internal Revenue Service (IRS) agent tracked down on Google Silk Road. To his surprise, he encountered and ad by Ross Ulbricht, using the alias 'Altoid'. Next came a second clue through a bitcoins forum and Ross obtained his e-mail address. The FBI asked Google for help in obtaining the origin of that account. The IP was of an apartment in San Francisco, where he was lunging as Josh Terry.

Then, an FBI agent contacted the Silk Road administrator, alias Dread Pirate Roberts, as a drug distributor, to do business with Silk Road. The agent pretended to buy a kilo of cocaine. An employee of Silk Road was given $7.000 in bitcoins to buy it and an address where to deposit the kilo of cocaine. The FBI arrested the employee. On 26 January 2013 Ulbricht contacted the undercover agent saying the employee had been arrested and to stop him talking he was offering $80.000 to kill the employee.

Following several investigations, on 1 October 2013, a group of agents are mobilized to arrest Ulbricht. Ross uses a public library to hide his IP. The agent connects to the Silk Road chat and has a short conversation with Ulbricht, asking him to check some of his messages. When Ulbricht accepts the agents get him and arrest him before he could delete any information and they verify that he was chatting. Finally, after Ross's detention, the FBI closed down the page on October 1 2013.

The results showed that Ross Ulbricht had made profits of $18 million, almost 10% of the money was illegal, performing 1.5 million transactions. During the whole operation bitcoins were confiscated to the value of $3.6 million.

The female judge sentenced him to a monetary fine of $183 million, and he was convicted to two life sentences (El Mundo, 2013), (RevistaDon), (USA Today, 2014), (TheGuardian 2013).

Figure 6: Silk Road
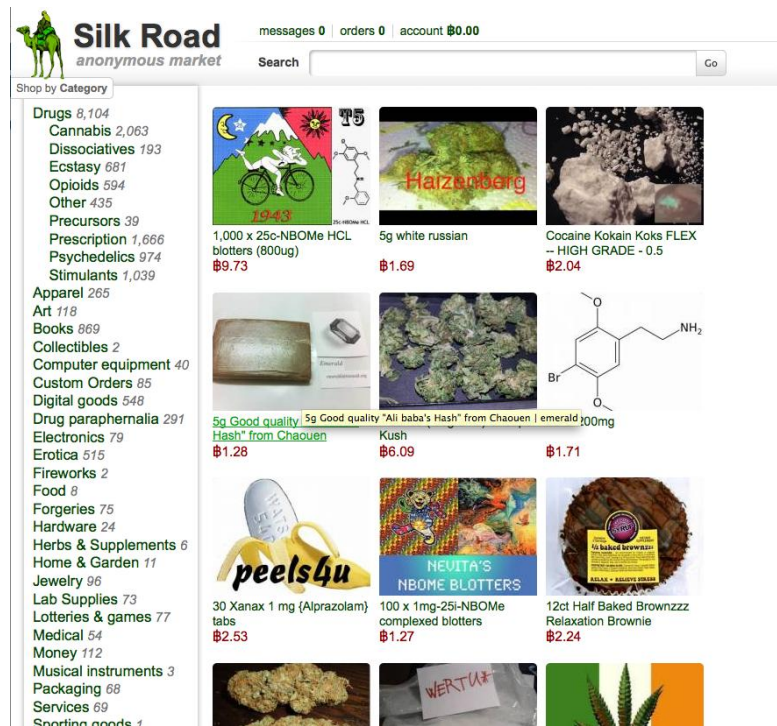
Source: El lado del mal (2013)

8. Conclusion

We have seen how the Bitcoin network system has facilitated the large criminal networks to laundry their money. For Bitcoin does not depend on any central middle man from the state nor from a financial institution, plus the existence of a precarious legal regulation.

On the other hand, currently, Bitcoin is having some difficulties regarding its functioning. The transactions process becomes complex due to the fact that is based on the new technologies and a lot of people does not know it. But, this is an advantage for the criminals of the internet, for it is difficult to track down their activities by the agents of the police. The Price of the bitcoin is very volatile, this in turn makes it difficult to attract investments, because of its high risks. A price rise will call investors attention and the market transactions level will also increase. The contrary will take place when the prices are down. The use of bitcoins as the currency for trading is in danger because of the charges of the commissions, this will increase the cost of bitcoins for any transaction.

Therefore, a solution to all of this will be to have the support of a financial system and a strict legal regulation, with the objective of solving and preventing the arising of all these problems, especially the money laundering. For this, the Interpol already has a department specialized in crimes committed through the use of virtual coins or money, such as bitcoins. There is in existence a special digital system securing Police intervention along with specialists in digital samples.

To end, it is a most to mention the blockchain technology, as it is one of the most important elements of the Bitcoin system. Although studies still are being carried out about this new technology, some companies and financial institutions are planning to use them, others have already applied them. There are certain reasons for this application of the new technology (to only mentioned a few): saving on some costs; having faster and automated processes; obtaining more control and security; replacing some central bodies; using electronic signatures. Moreover, benefitting from its use through a public and a private code, it might be possible to control further the intelectual property rights.

Adding that my research is based on the workings, characteristics and situations that can arise through the use of Bitcoin for the laundering of money. For this, it is hoped that in future studies, the Bitcoin might have a better legal regulation, and also that it

might be possible to act in a more efficient way in preventing the use of bitcoins for illicit purposes.

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