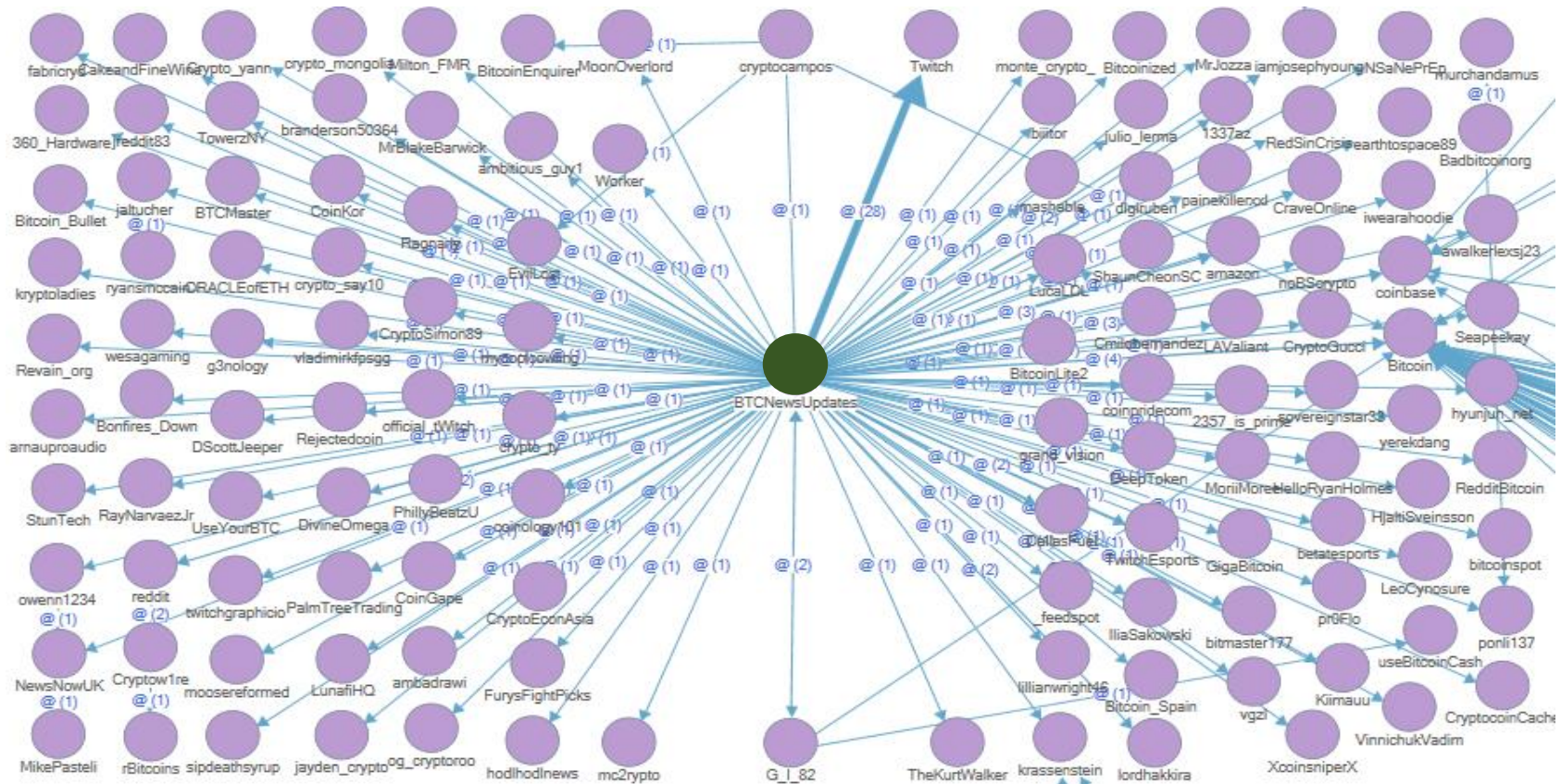


APPENDICES

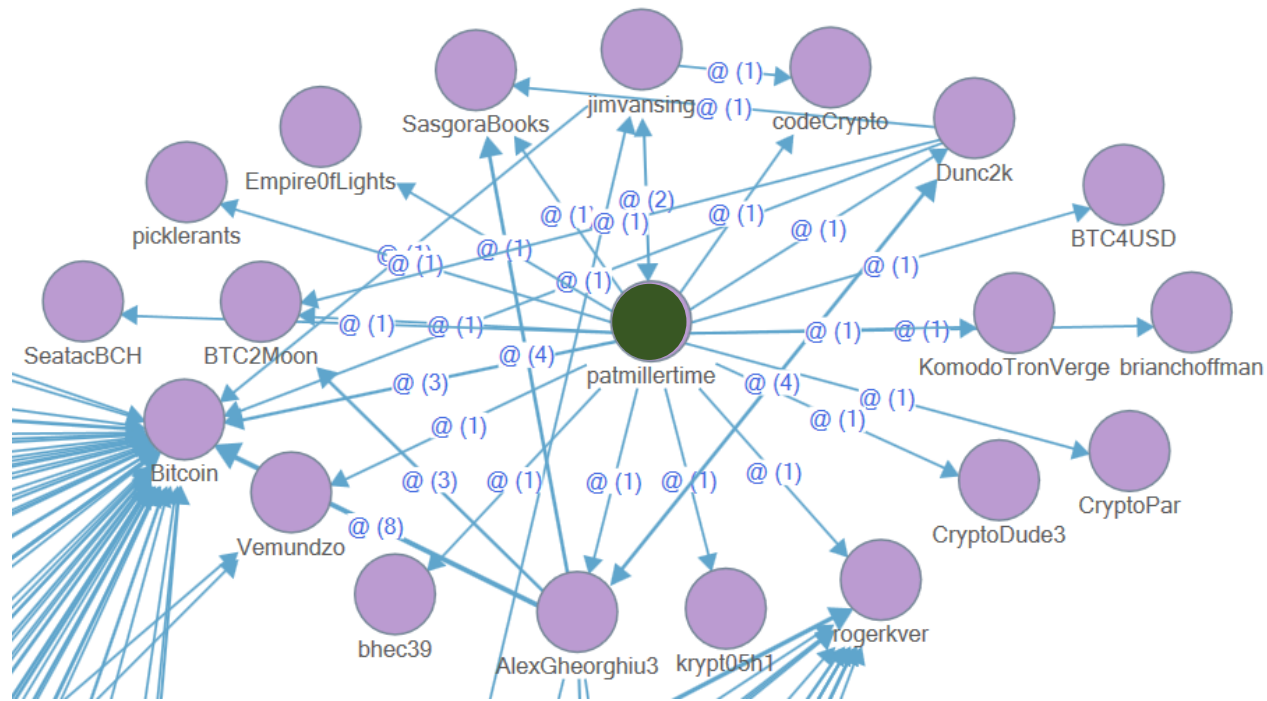
Appendix A – Twitter Sociogram Figure

Appendix A1 - BTCNewsUpdates's Twitter Sociogram



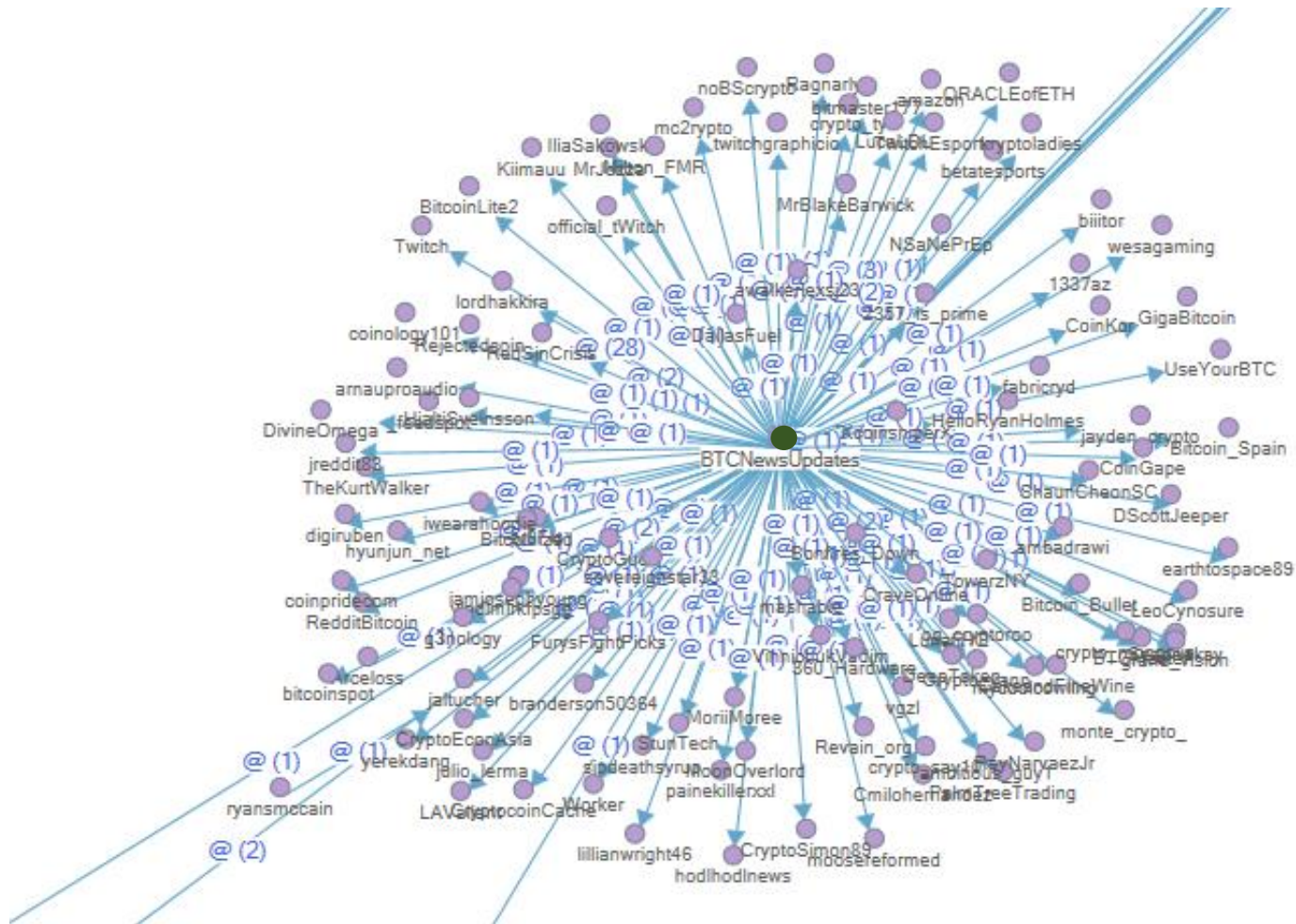
Source: Data is processed with NVIVO 11 Plus by researcher | Diagram displayed by the degree measurement

Appendix A2 - Patmillertime's Twitter Sociogram



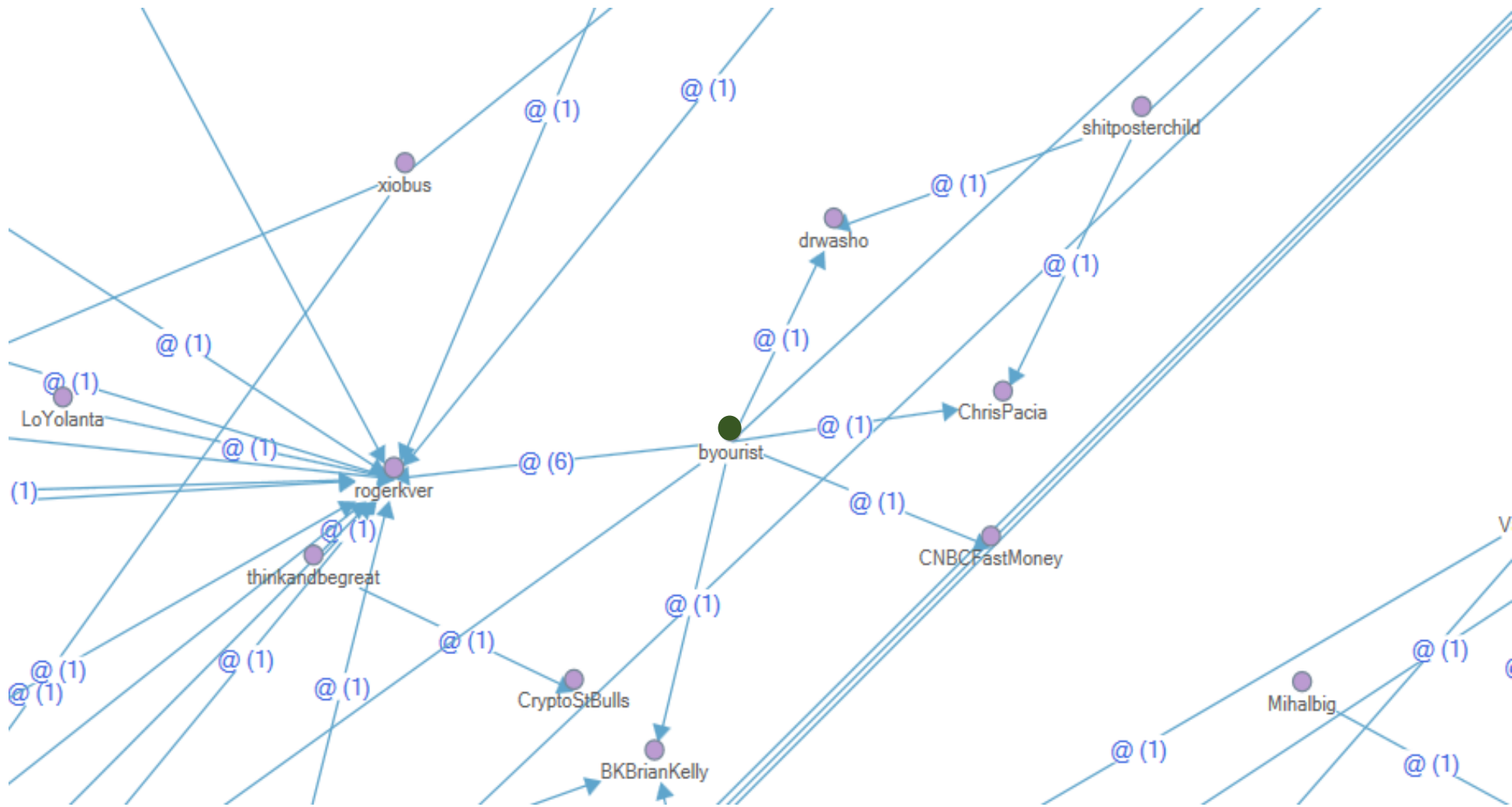
Source: Data is processed with NVIVO 11 Plus by researcher | Diagram displayed by the degree measurement

Appendix A3 - BTCNewsUpdates's Twitter Sociogram



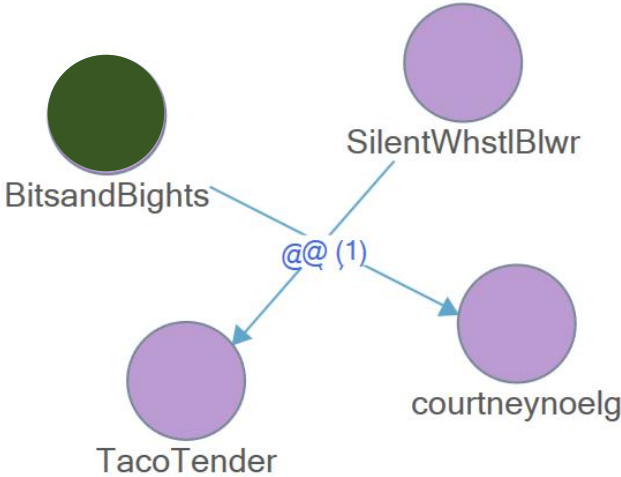
Source: Data is processed with NVIVO 11 Plus by researcher | Diagram displayed by the betweenness measurement

Appendix A4 - Byourist's Twitter Sociogram



Source: Data is processed with NVIVO 11 Plus by researcher | Diagram displayed by the betweenness measurement

Appendix A5- BitsandBights’s Twitter Sociogram



Source: Data is processed with NVIVO 11 Plus by researcher

Diagram displayed by the closeness measurement

Appendix B – Classification of Official Bodies

Official Bodies	Continent	Country	Type of Bodies
Bank of England	Europe	UK	Central Bank
Bank of Japan	Asia	Japan	Central Bank
Deutsche Bundesbank	Europe	Germany	Central Bank
European Central Bank	Europe	European Union	Central Bank
Federal Bureau Investigation	America	USA	Law Enforcement Agency
Federal Reserve Bank	America	USA	Central Bank
Reserve Bank of New Zealand	Australia	New Zealand	Central Bank
Reserve Bank of Zimbabwe	Africa	Zimbabwe	Central Bank
US Government Accountability Office	America	USA	Legislative Gove. Agency

Appendix C – Classification of Official Reports Sources

Official Bodies	Reference	Author	Title	Reference Type	Year
Bank of England	Bank of England	Robleh, Ali; Barrdear, John; Clews, Roger;	Innovations in Payment Technologies and the Emergence of Digital Currencies	Official Report	2014
Bank of Japan	Bank of Japan 1	Bank of Japan	Payment and Settlement Systems Report	Official Report	2016
Bank of Japan	Bank of Japan 2	Bank of Japan	Summary of the Forum on Payment and Settlement Systems on March 17 and 18, 2016	Official Report	2016
Bank of Japan	Bank of Japan 3	Nakaso, Hiroshi	FinTech - Its Impacts on Finance, Economics and central banking	Official Report	2016
Deutsche Bundesbank	Deutsche Bundesbank 1	Deutsche Bundesbank	Monthly Report; September 2017	Official Report	2017
Deutsche Bundesbank	Deutsche Bundesbank 2	Deutsche Bundesbank	War on Cash; Is There a Future for Cash?	Official Report	2017
European Central Bank	European Central Bank 1	European Central Bank	Virtual Currency Schemes - A Further Analysis	Official Report	2015
European Central Bank	European Central Bank 2	European Central Bank	Virtual Currency Schemes	Official Report	2012
European Central Bank	European Central Bank 3	Draghi, Mario	Opinion of the European Central Bank	Official Report	2016
Federal Bureau Investigation	Federal Bureau of Investigation 1	Federal Bureau Investigation	How to Protect Your Networks from Ransomware	Official Report	2016

Official Bodies	Reference	Author	Title	Reference Type	Year
Federal Bureau Investigation	Federal Bureau of Investigation 2	Internet Crime Complaint Center	2014 Internet crime report	Official Report	2014
Federal Reserve Bank	Federal Reserve Bank	Badev, Anton; Chen, Matthew	Bitcoin: Technical Background and Data Analysis	Official Report	2014
Reserve Bank of New Zealand	Reserve Bank of New Zealand 1	Bascand, Geoff	The Evolution of New Zealand's currency	Official Report	2014
Reserve Bank of New Zealand	Reserve Bank of New Zealand 2	Budding, Edwin	Memorandum of Payment Oversight Committee	Official Report	2013
Reserve Bank of New Zealand	Reserve Bank of New Zealand 3	Fujii-Rajani, Riki	FinTech - Developments in Banking, Insurances, and FMIs	Official Report	2018
Reserve Bank of New Zealand	Reserve Bank of New Zealand 4	Kumar, Aaron; Smith, Christie	Crypto-currencies; An Introduction to Not-so-Funny Moneys	Official Report	2017
Reserve Bank of New Zealand	Reserve Bank of New Zealand 5	Spencer, Grant	Reserve Bank Perspective on Payments	Official Report	2014
Reserve Bank of Zimbabwe	Reserve Bank of Zimbabwe	Reserve Bank of Zimbabwe	Cybercrime in Zimbabwe and Globally	Official Report	2015
U.S Government Accountability Office	U.S Government Accountability Office 1	U.S Government Accountability Office	Virtual Currencies; Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges	Official Report	2014
U.S Government Accountability Office	U.S Government Accountability Office 2	U.S Government Accountability Office	International Remittances; Money Laundering Risks and Views on Enhanced Customer Verification and Recordkeeping Requirements	Official Report	2016

Appendix D – Classification of Top 40 Twitter Users

No	Username	Name	Number of Tweets	Number of Followers	Number of Followings	Type of Users	Continent	Country
1	_Strategia_	Strategia	357	96	69	Business Account	South America	Brazil
2	1234goplay	Kimmcel Keno	80866	206	151	Personal	North America	USA
3	AlexGheorghiu3	Alex Gheorghiu	152	7	2	Personal	Australia	Australia
4	BitcoinBolt	Bitcoin Bolt	54706	10453	582	Business Account	Unassigned	Unassigned
5	BitcoinInsight0	Bitcoin Insight	15673	432	1241	Business Account	Unassigned	Unassigned
6	Bitcoinized	Bitcoinized	93982	2721	55	Business Account	Unassigned	Unassigned
7	BitcoinWrld	Bitcoin World	129147	41552	2331	Business Account	Unassigned	Unassigned
8	Bitfinxed	Bitfinex'ed	19098	31075	659	Business Account	North America	USA
9	BitsandBights	BitsandBights	141	14	175	Business Account	Unassigned	Unassigned
10	BrianBrownNet	Brian Brown, Ph.D	1763388	5071	171	Personal	North America	USA
11	BTCNewsUpdates	Bitcoin (Cash) News	13335	3016	239	Business Account	Unassigned	Unassigned
12	byourist	BJYWestwood	1006	180	670	Personal	North America	USA
13	CogitoErgoCode	Ryan	2586	4286	4284	Personal	Unassigned	Unassigned
14	CoinLook	CoinLook	105103	26535	13316	Business Account	North America	USA
15	coinspectator	Coin Spectator	86290	7412	1196	News Account	Europe	United Kingdom
16	Crypto_Newz	Crypto Currency Newz	27624	23717	1949	Business Account	Unassigned	Unassigned
17	crypto_savior	Crypto Savior	1698	413	10	Personal	Australia	New Zealand
18	CryptoBrokerIO	Crypro Broker	18276	348	57	Business Account	Unassigned	Unassigned
19	CryptoCurrent	ጋጋ.cc	159678	46062	582	Business Account	Africa	Ethiopia
20	cryptominernews	Fake Crypto News	75591	3426	3423	Business Account	Unassigned	Unassigned

No	Username	Name	Number of Tweets	Number of Followers	Number of Followings	Type of Users	Continent	Country
21	Cryptow1re	Cryptowire	84760	1334	705	Business Account	Unassigned	Unassigned
22	DailyBrian	Daily Brian	1308080	2623	164	Personal	North America	USA
23	darkisdarkn1	Dark	32520	132	63	Business Account	Europe	France
24	devnullius	#Altcoin Devvie	358618	85674	67675	Business Account	Unassigned	Unassigned
25	DigitalDoshNews	Digital Dosh News	123910	1918	79	Business Account	Unassigned	Unassigned
26	INeedRocksNMoon	Crypto Tyrone Biggums	622	55	134	Unassigned	Unassigned	Unassigned
27	JacekSalaj	#Best seller	64396	13103	14144	Business Account	Unassigned	Unassigned
28	jidept	Jide Akintola	314	158	327	Personal	Europe	United Kingdom
29	LetsTalkPaymnts	Let's Talk Payments	32490	12846	1750	News Account	North America	USA
30	mikenavid18	Michael Navid	13	1	2	Personal	Unassigned	Unassigned
31	oskaaay	Olasunkanmi Fakeye	65608	58024	46401	Personal	Africa	Nigeria
32	patmillertime	Patrick Miller	162	430	431	Personal	North America	USA
33	petergo99037185	Lucky Pete	232191	76	31	Personal	North America	USA
34	politicalHEDGE	Political HEDGE	140682	86935	59825	News Account	North America	USA
35	Remi_Vladuceanu	Remi Vee	280880	130885	110305	Personal	Unassigned	Unassigned
36	RoccoDallas	BitTrail	160657	1707	57	Business Account	Asia	UAE
37	SportsbookBTC	Bitcoin Sportsbook	1296659	36740	29260	Business Account	Unassigned	Unassigned
38	Valustks1	Bcash = Bitcon stay away	2125	172	515	Personal	Unassigned	Unassigned
39	waq_azeem	Waqar Azeem	1688	619	686	Personal	Asia	Pakistan
40	WuWeiTaoist	WuWei	62081	664	1131	Personal	Europe	France

Appendix E – Framework Matrix of Official Report and Problem Formulation 1

Appendix E1 – Framework Matrix of Official Report and Cons of Bitcoin as Payment System

	A : Anonymous Users in Payment System	B : Does Not Meet the Criteria of Payment System	C : High Volatility in Payment System
Bank of England	How to achieve consensus between people in a network when nobody can be completely sure who can be trusted has long been recognised as a problem in the field of computer science.		
Deutsche Bundesbank 2	In addition, doubts have been raised over whether it is, indeed, impossible to trace who carried out a bitcoin payment		
European Central Bank 1	<p>Even the basic functioning of VCS can be difficult to understand for a user. Most of the time, there is only limited information available, if any, especially for the smaller VCS. Furthermore, no transparency requirements apply.</p> <p>In payment systems, this risk is mitigated by appropriate safeguards, i.e. access requirements and know-your-customer requirements.</p> <p>to counterparty risk related to the anonymity of the payee</p>	<p>In Finland, the central bank has stated that Bitcoin does not fulfil the criteria for a currency or a payment instrument</p> <p>Not currency and not a payment instrument Bitcoins could fall within the scope of the Prevention of Money Laundering and Terrorist Financing Act</p>	<p>accept payments in Bitcoin without the exchange risk related to the high volatility</p> <p>In particular, users are exposed to exchange rate risk related to high volatility</p>
European Central Bank 2		Virtual currencies cannot therefore be considered to be safe money, since the likelihood of the asset retaining its value for the holder, and hence its acceptability to others as a means of payment cannot be ensured	

	A : Anonymous Users in Payment System	B : Does Not Meet the Criteria of Payment System	C : High Volatility in Payment System
European Central Bank 2		<p>It is quite clear that virtual currency schemes do not comply with most of the Core Principles, especially in relation to their legal basis (CP I); the rules and procedures in place in order to enable participants to have a clear understanding of the risks they are taking (CP II); the procedures for the management of credit and liquidity risks (CP III); the asset used for the settlement, i.e. the virtual currency (CP VI); the degree of security and operational reliability (CP VII); and the governance arrangements (CP X).</p> <p>As a consequence, Bitcoin clearly falls outside the scope of the Payment Services Directive.</p>	
European Central Bank 3		Second, given that virtual currencies are not in fact currencies, it would be more accurate to regard them as a means of exchange, rather than as a means of payment	
Reserve Bank of New Zealand 1		finite number of Bitcoins possible mean that their scarcity value tends to make them more like speculative investment commodities than transactional payment instruments.	Large swings in the value of a Bitcoin means its purchasing power fluctuates considerably
Reserve Bank of New Zealand 4	Crypto-currency transactions made it possible for sellers on the Silk Road market place to remain pseudonymous because there was no centralised authority		
Reserve Bank of Zimbabwe	owner since it uses anonymous names and is independent of monetary authorities.		

	D : Low Usage of Bitcoin to Pay Goods or Services	E : No Central Bank for Bitcoin as Payment System	F : No Legal Jurisdiction as Payment System
Bank of Japan 2	Bitcoins are thought to be used for investment and not as a settlement measure.		
Deutsche Bundesbank 1		When using DLT, the question might arise in future as to whether central bank- issued digital currency could be provided for the safe settlement of such larger transactions.	
European Central Bank 1		In addition, the systems are not currently subject to oversight by a central bank	When using virtual currencies as a means of payment for goods and services, users are not protected by any refund rights offered for (unauthorised) transfers from a conventional payment account, as it is under EU law.
European Central Bank 2			<p>Legal risk. There are many legal uncertainties regarding virtual currency schemes. In virtual currency schemes, the lack of a proper legal framework substantially exacerbates the other risks.</p> <p>However, in contrast to traditional payment systems, they are not regulated or closely overseen by any public authority.</p> <p>Virtual currency schemes visibly lack a proper legal framework, as well as a clear definition of rights and obligations for the different parties.</p>
Reserve Bank of Zimbabwe	with no central authority or bank.		

	D : Low Usage of Bitcoin to Pay Goods or Services	E : No Central Bank for Bitcoin as Payment System	F : No Legal Jurisdiction as Payment System
European Central Bank 2			The legal uncertainty surrounding these schemes might constitute a challenge for public authorities, as these schemes can be used by criminals, fraudsters and money launderers to perform their illegal activities.
European Central Bank 3	As noted by the Bank for International Settlements (BIS), the distributed ledger technology underlying many digital currency schemes could have a much broader application beyond payments		
Federal Reserve Bank	Bitcoin is still barely used for payments for goods and services	in contrast to most traditional payment systems where various parties, such as banks, processors, and networks, sit between the payor and payee, there is no designated intermediary in Bitcoin	To our knowledge, a bitcoin has no legal tender status in any jurisdiction at the time
Reserve Bank of New Zealand 2	Bitcoin would be a clear step forward as payment system if people actually used it to pay for things. But they don't. The people who have bitcoins don't use them, and the people who don't have them don't want them. Indeed, a new survey from The Street finds that 79 percent of people have never used a cryptocurrency and never want to		
Reserve Bank of New Zealand 3	At the time of writing this article, crypto-currencies are not widely used and the main activity involving them amounts to the mere buying and selling of them as a commodity.		
Reserve Bank of New Zealand 4	crypto-currencies facilitate a relatively small volume of transactions	Crypto-currency transactions made it possible for sellers on the Silk Road market place to remain pseudonymous because there was no centralised authority	

Appendix E2 – Framework Matrix of Official Report and Pros of Bitcoin as Payment System

	A : High Demand for Payment Instead Investment	B : Payment System is User Friendly	C : Substantial Technology Behind Bitcoin as Payment System
Bank of England		Based on this premise, a number of start-up businesses are seeking to offer payment facilities that use digital currencies as a bridge mechanism for settlement.	the key innovation of digital currencies is the ‘distributed ledger’ which allows a payment system to operate in an entirely decentralised way, without intermediaries such as banks
Bank of Japan 2			<p>This indicates how the blockchain technology is providing a spark to bring innovation to payment services</p> <p>I believe the blockchain is a technology with great potential that can be applied to a much wider area than the one currently being discussed.</p>
European Central Bank 1	payment facilitators (allowing merchants, mainly in e-commerce, to accept virtual currencies as a payment method	<p>the provision of additional payment alternatives for consumers</p> <p>A further potential advantage is that no personal or sensitive payment data are needed for making a payment. Unlike a card-not-present payment, for example - for which personal data and sensitive payment data need to be transmitted over the internet</p> <p>The advantages can thus be grouped into the areas of usage possibilities, speed, costs and development of alternative payment solutions</p>	This also means that new and agile actors, mostly with a background in IT and knowledge of its possibilities, have been able to enter the world of payments. They are suggesting new payment solutions for the digital age.

	A : High Demand for Payment Instead Investment	B : Payment System is User Friendly	C : Substantial Technology Behind Bitcoin as Payment System
European Central Bank 1		VCS could also have some advantages over traditional payment solutions and specifically for payments within virtual communities/closed-loop environments and for cross-border payments	
European Central Bank 2		transactions are carried out faster and more cheaply than with traditional means of payment. Transactions fees, if any, are very low and no bank account fee is charged	These schemes can have positive aspects if they contribute to financial innovation and provide additional payment alternatives to consumers.
European Central Bank 3	underlying alternative means of payment, such as virtual currencies, may have the potential to increase the efficiency, reach and choice of payment and transfer methods.		
Federal Reserve Bank	<p>As of October 7, 2014 more than 64, 000 businesses were reported to accept payments in bitcoins around the world</p> <p>independently of the success of Bitcoin, to a broader set of economic practices reaching beyond the payment industry.</p> <p>Rather, a bitcoin's value is derived mainly from its use for making payments in the Bitcoin system,</p> <p>These overall statistics provide an estimate of the proportion of demand that is driven by payment motives</p>	the entities transact directly, that is, in contrast to most traditional payment systems	<p>independently of the success of Bitcoin, to a broader set of economic practices reaching beyond the payment industry.</p> <p>because we believe that cryptographic and distributed algorithms may have applications to a broader set of economic practices reaching beyond the payment industry</p>

	A : High Demand for Payment Instead Investment	B : Payment System is User Friendly	C : Substantial Technology Behind Bitcoin as Payment System
Reserve Bank of New Zealand 1	Virtual currencies, of which the best known is bitcoin, have been created as an alternative means of payment and store of value		
Reserve Bank of New Zealand 2		by speculators, which has fueled price volatility. Bitcoin as a form of payment for products and services has seen growth, however, and merchants have an incentive to accept the currency because transaction fees are lower than the fees typically imposed by credit card processors.	
Reserve Bank of New Zealand 4		Crypto-currencies expand the mechanisms by which people can transact with each other, strengthening competitive pressures on payment systems providers.	Merchants may also adopt crypto-currencies to attract new customers. Early adopters of technology may be more inclined to use services of companies that offer crypto-currencies as a payment method simply because they like being involved with new technologies (BIS, 2015).
Reserve Bank of Zimbabwe			Bitcoin is a new innovative payment network, which uses peer-to-peer technology to operate
U.S Government Accountability Office 1		Because they operate over the Internet, virtual currencies can be used globally to make payments and funds transfers across borders.	

Appendix E3 – Framework Matrix of Official Report and Cons of Bitcoin as Virtual Currency

	A : Anonymous Users using Virtual Currency	B : Does Not Meet the Criteria of Currency	C : High Volatility as Virtual Currency
Bank of England	Bitcoin users do not have to disclose who they are		It has also exhibited significant volatility, which has led to considerable debate and media attention.
Bank of Japan 3	In order for any asset to be used and accepted as currency, it must have sufficient "trust" among a wide range of users. In this respect, "bitcoin" attempts to create a "chain of trust" from scratch, but this requires substantial costs for the electric power needed to verify transactions called "mining" and to manage encryption keys.		
Deutsche Bundesbank 1	The original blockchain for Bitcoin was created for a virtual currency. Its key characteristics are the intermediary- free, direct (P2P) transfer of Bitcoins, its accessibility for any participant who is not required to operate under their real name (and may operate under multiple pseudonyms)		
European Central Bank 1	VCS present several drawbacks and disadvantages for users, i.e. lack of transparency, clarity and continuity anonymity of the actors involved whereas in other cases their identity remains unknown (e.g. for Bitcoin and most other decentralised VCS	A number of authorities specifically pointed out that, legally, Bitcoin is not a currency, does not have the status of legal tender and/or does not meet the definition of a financial instrument. In Sweden too, Bitcoin does not meet the definition of a currency and is taxed as an asset. It does not meet the Swedish definition of a currency, as currencies are tied to a central bank or a geographic area.	and high volatility as well as during phases of high volatility in its exchange rates, and yet again following the closing of Mt. Gox as the world's biggest exchange for Bitcoin (February 2014) To illustrate the above, the price volatility of Bitcoin. When considering virtual currencies as a means of exchange, their price volatility is presented in Chart 2. Longer-term data on other VCS are scarce, but the change in exchange rates over 24 hours can easily exceed 10%, and can be over 100%

	A : Anonymous Users using Virtual Currency	B : Does Not Meet the Criteria of Currency	C : High Volatility as Virtual Currency
European Central Bank 1	<p>Other actors that have appeared are “tumblers”, which provide a service for further increasing the anonymity of the payer by making it more difficult to find out where the virtual currency transaction came from</p> <p>given the high level of anonymity and the consequent de facto inability to identify the counterparty of a transaction/ operation involving VCS.</p>	<p>The German Ministry of Finance has stated that it regards Bitcoin as a unit of account; the financial supervisor added that units of account (such as Bitcoin, IMF special drawing rights, regional currencies, etc.) that are not legal tender do qualify as financial instruments.</p> <p>Outside Europe, Bank Negara Malaysia has clarified that Bitcoin is not legal tender and Bank Indonesia has stated that only the rupiah is legal tender</p> <p>In some countries, certain activities related to virtual currencies are banned</p> <p>Bitcoin is not a currency. “Bitcoin does not have any real trading value compared to gold and silver, and thus is more similar to glass beads</p> <p>Not currency and not a payment instrument Bitcoins could fall within the scope of the Prevention of Money Laundering and Terrorist Financing Act</p>	<p>The history of Bitcoin shows that this exchange rate of a virtual currency can be highly volatile</p> <p>There is a risk that the value of a business operation involving a VCS or of an investment in a VCS is affected by changes in exchange rates (exchange rate risk associated with the high volatility)</p> <p>Given the drawbacks, disadvantages and risks, many VCS appear to be more an investment or speculation vehicle, especially in the light of the high volatility,</p> <p>Finally, both the low level of acceptance and the high volatility of their exchange rates and thus purchasing power make them unsuitable as a unit of account.</p> <p>The developments of Bitcoin, specifically, confirmed that VCS are inherently unstable.</p>
European Central Bank 2			<p>Firstly, these schemes rely on a specific exchange rate that may fluctuate, since the value of the virtual currency is usually based on its own demand and supply</p> <p>we can conclude that virtual currency schemes do not pose a risk for price stability at this stage</p>

	A : Anonymous Users using Virtual Currency	B : Does Not Meet the Criteria of Currency	C : High Volatility as Virtual Currency
European Central Bank 3			The ECB has several concerns as regards the differences that exist between what the proposal refers to as 'fiat currencies' and 'virtual currencies', one of which is the volatility associated with virtual currencies, which is typically higher than with currencies issued by central banks or whose issue is otherwise authorised by central banks
Reserve Bank of New Zealand 3			However, there are risks arising from price fluctuation in cryptocurrencies.
Reserve Bank of New Zealand 4	Credit is largely incompatible with the (pseudo) anonymity that is a common element of crypto-currency design.	The Australian Tax Office treats crypto-currencies as an asset for capital gains tax purposes and does not regard crypto-currencies as a currency. Rather, transactions implemented using crypto-currencies are seen as barter arrangements subject to the Australian goods and services tax, and wages paid in bitcoins could be subject to fringe benefit taxes.	Bitcoin, the most-traded crypto-currency, has been a volatile and hence imperfect store of value Crypto-currencies have been a highly volatile store of value, which is most apparent in the extremely high volatility exhibited by Bitcoin relative to traditional fiat currencies
Reserve Bank of New Zealand 5		As the currency issuer, the Reserve Bank does not feel threatened by Bitcoin which seems to behave more like a commodity than a currency. However, I do not doubt that future digital currencies will become more realistic substitutes for cash.	
U.S Government Accountability Office 1	Virtual currency systems may provide greater anonymity than traditional payment systems and sometimes lack a central intermediary to maintain transaction information.		Volatile prices. The prices of virtual currencies can change quickly and dramatically

	A : Anonymous Users using Virtual Currency	B : Does Not Meet the Criteria of Currency	C : High Volatility as Virtual Currency
U.S Government Accountability Office 1	<p>Because peer-to-peer bitcoin transactions do not require the disclosure of information about a user's identity, they give the participants some degree of anonymity</p> <p>The emergence of virtual currencies presents challenges to federal agencies responsible for financial regulation, law enforcement, and consumer and investor protection. These challenges stem partly from certain characteristics of virtual currencies, such as the higher degree of anonymity they provide and the ease with which they can be sent across borders.</p> <p>However, in a transfer between two individuals using bitcoins (or a similar type of decentralized virtual currency) no personally identifiable information is necessarily disclosed either to the two individuals or a third-party intermediary</p>		

	D : No Central Bank for Bitcoin as Virtual Currency	E : No Legal Jurisdiction as Virtual Currency
Bank of England	<p>Users can trade digital currencies with each other in exchange for traditional currency or goods and services without the need for any third party (like a bank).</p> <p>It was launched in January 2009 and is a privately developed, internet-based currency and payment system that requires no intermediaries (like banks) for the processing of payments</p> <p>Furthermore, the supply of bitcoins is not controlled by a central bank.</p>	
Bank of Japan 1	It is also pointed out that, for many digital currencies, there is no specific operator such as a bank.	
Bank of Japan 2		On the other hand, "public-"type DLTs have been developed mainly by non-financial institutions without paying particular attention to financial regulations.
Bank of Japan 3	Their argument for central bank digital currency seems to be based on the increased awareness of the costs of processing and storing paper-based banknotes, and they ask the central bank to adopt the newest information technology in order to satisfy the needs of the economy.	
Deutsche Bundesbank 1	When using DLT, the question might arise in future as to whether central bank- issued digital currency could be provided for the safe settlement of such larger transactions.	
European Central Bank 1	<p>For the purpose of this report, it is defined as a digital representation of value, not issued by a central bank</p> <p>a digital representation of value, not issued by a central bank, credit institution or e-money institution</p>	<p>Virtual currency is also not money or currency from a legal perspective</p> <p>Currently, if VCS have a legal status at all, it is unclear and the key actors are generally neither regulated nor supervised.</p> <p>Given that VCS are not used widely to exchange value, they are not legally money, and - in the absence of minted versions - they are not currency either, and no virtual currency is a currency.</p>

	D : No Central Bank for Bitcoin as Virtual Currency	E : No Legal Jurisdiction as Virtual Currency
European Central Bank 1	<p>Owing to the decentralised nature of many or most VCS (like Bitcoin), there is no single entity to be held accountable for the integrity of the VCS and/or to enforce the rules of functioning (other than those enforced by the protocol/algorithm itself)</p> <p>Virtual currencies are not considered legal currency, since they are not issued by the government's monetary authority</p>	<p>No virtual currency has so far been declared the official currency of a state, nor do any physical formats, backed by law, have a legal tender capacity.</p> <p>the risks mostly remain unmitigated by legislation, regulation or supervision</p>
European Central Bank 2	<p>The absence of a distinct legal framework leads to other important differences as well. Firstly, traditional financial actors, including central banks, are not involved.</p> <p>The first case study in this report relates to Bitcoin, a virtual currency scheme based on a peer-to-peer network. It does not have a central authority in charge of money supply, nor a central clearing house, nor are financial institutions involved in the transactions</p> <p>On the one hand, the Bitcoin scheme is a decentralised system where - at least in theory - there is no central organiser that can undermine the system and disappear with its funds.</p> <p>Since virtual currency payments are not settled in central bank money or commercial bank money, nor is there any lender of last resort, a crucial element affecting the virtual exchange rate is the trust gained by the virtual currency issuer.</p>	<p>A virtual currency can be defined as a type of unregulated, digital money, which is issued and usually controlled by its developers</p> <p>Virtual currency schemes differ from electronic money schemes insofar as the currency being used as the unit of account has no physical counterpart with legal tender status</p> <p>However, it is clear that they can also pose risks for their users, especially in view of the current lack of regulation</p> <p>Bitcoin's legal framework is very unclear</p>
Federal Reserve Bank	<p>in contrast to most traditional payment systems where various parties, such as banks, processors, and networks, sit between the payor and payee, there is no designated intermediary in Bitcoin</p>	<p>To our knowledge, a bitcoin has no legal tender status in any jurisdiction at the time</p>

	D : No Central Bank for Bitcoin as Virtual Currency	E : No Legal Jurisdiction as Virtual Currency
European Central Bank 3		Consistent with the approach, which has either already been adopted, or is currently being considered, by other jurisdictions regulating virtual currency exchange platforms, including Canada, Japan and the United States, the ECB recommends defining virtual currencies more specifically, in a manner that explicitly clarifies that virtual currencies are not legal currencies or money
Reserve Bank of New Zealand 3		The legality of a blockchain-based contract is uncertain, and this may require 9 Further information on the mechanics of ‘proof of work’ can be found in Kumar and Smith. 10 Refer to footnote 12 for an illustration of computational cost. an administrative step to transform the smart contract into a legal document until blockchain is accepted as a legal document by law. A key risk in DLT generally is a lack of settlement finality and legal uncertainty.
Reserve Bank of New Zealand 4	<p>Crypto-currencies are not backed by the promises of a similar institution and they are usually denominated in their own units.</p> <p>Crypto-currencies are a decentralised technology designed to facilitate transactions without recourse to a central institution.</p> <p>Crypto-currencies pose a challenge for all regulators, because the decentralised ledger system means there is no central authority to regulate.</p>	
U.S Government Accountability Office 1	For example, the FBI has noted that because bitcoin does not have a centralized entity to monitor and report suspicious activity and process legal requests such as subpoenas, law enforcement agencies face difficulty in detecting suspicious transactions using bitcoins and identifying parties involved in these transactions.	

	D : No Central Bank for Bitcoin as Virtual Currency	E : No Legal Jurisdiction as Virtual Currency
U.S Government Accountability Office 1	Lack of bank involvement. Virtual currency exchanges and wallet providers are not banks. If they go out of business, there may be no specific protections like deposit insurance to cover consumer losses.	
U.S Government Accountability Office 2		The Financial Action Task Force also reported that virtual currency-digital representations of value that are not government issued, such as Bitcoin

Appendix E4 – Framework Matrix of Official Report and Pros of Bitcoin as Virtual Currency

	A : Substantial Technology Behind Bitcoin as Virtual Currency	B : Transaction is User Friendly as Virtual Currency
Bank of England	<p>Although the monetary aspects of digital currencies have attracted considerable attention, the distributed ledger underlying their payment systems is a significant innovation</p> <p>But since the potential applications are, in principle, broader than just payments, the distributed ledger technology may perhaps be better described as a first attempt at an ‘internet of finance’</p>	digital currencies like Bitcoin, which combine new currencies with decentralised payment systems.
Bank of Japan 1	the birth of digital currencies and the utilization of the distributed ledger can help enhance economic welfare and revitalize economic activities through efficient payment, improved services and promotion of competition.	
Bank of Japan 2	<p>public-type DLTs could be better in terms of managing such a huge amount of transactions.</p> <p>If they increase the use of virtual currencies based on public-type DLTs, virtual currency could prevail instead of sovereign currencies</p> <p>I believe the blockchain is a technology with great potential that can be applied to a much wider area than the one currently being discussed.</p>	
European Central Bank 1	Nevertheless, VCS present some advantages as perceived by users. They could pose a challenge to retail payment instruments and innovative payment solutions as regards costs, global reach, anonymity of the payer and speed of settlement	

	A : Substantial Technology Behind Bitcoin as Virtual Currency	B : Transaction is User Friendly as Virtual Currency
European Central Bank 1	although VCS can have positive aspects in terms of financial innovation	
European Central Bank 2	An additional reason for implementing a virtual currency scheme is the possibility, in Type 2 and 3 schemes, to obtain new revenue from the float that results from the time difference between the moment at which money is transferred into the system and the moment at which it is taken out from the system again	
Federal Reserve Bank		Thus, the verification and the record keeping of transactions is decentralized
U.S Government Accountability Office 1	Cost and speed. Decentralized virtual currency systems may, in some circumstances, provide lower transaction costs and be faster than traditional funds transfer systems because the transactions do not need to go through a third-party intermediary. Cost and speed. Decentralized virtual currency systems may, in some circumstances, provide lower transaction costs and be faster than traditional funds transfer systems because the transactions do not need to go through a third-party intermediary.	Access. Because virtual currencies can be accessed anywhere over the Internet, they are a potential way to provide basic financial services to populations without access to traditional financial Access. Because virtual currencies can be accessed anywhere over the Internet, they are a potential way to provide basic financial services to populations without access to traditional financial

Appendix E5 – Framework Matrix of Official Report and Fraud Related Opinion of Bitcoin

	A : Inappropriate Practice	B : Payment in Dark Markets	C : Bitcoin is A Scam
Bank of Japan 3	Also, in the practice of bitcoin transactions, encryption keys have sometimes been entrusted to a third party in a centralized manner, but there have been some incidents such as the failure of Mt. Gox in 2014. In this case, people tried to avoid the cost of managing keys accompanying decentralized-type information processing by entrusting their keys to a third party, Mt. Gox. But their trust was destroyed by the misconduct of the third party.		
Deutsche Bundesbank 2	Finally, technical progress, especially cyber money (bitcoin), and other electronic means are rapidly changing payment habits and hence will be heavily used by criminals, too.	Besides, an electronic payment instrument which has all the features of cash would be a dream come true for everyone operating in the shadow economy, as well as for terrorists. Initial indications of such a development have already been observed in connection with bitcoins and	
European Central Bank 1	<p>some of the vulnerabilities of the PoW system, such as the possibility of manipulation through a (temporary) monopoly on mining (the 51% attack¹⁰) and the high energy consumption.</p> <p>Specifically, there is a risk that users invest in units of a VCS, or decide to make costs to earn from subsequent mining activity, in order to profit from price increases being unduly promised by inventors or issuers (investment fraud risk associated with the lack of transparency).</p> <p>As it is hardly possible to link the pseudonyms with the real persons or organisation behind it, fraudsters could take advantage of this</p>		<p>A great many of them could be nothing more than “scamcoins”, i.e. VCS that are created with the main objective of swindling naive buyers, either as consumers/payers or as investors</p> <p>The rapid appearance, the absence of different functionality for most of them, the absence of indications that these are being used for payments and the anecdotal evidence found on some of the virtual currencies’ websites and blogs all indicate that a majority of these altcoins can be placed in the category of profiteering (scamcoins)</p>

	A : Inappropriate Practice	B : Payment in Dark Markets	C : Bitcoin is A Scam
European Central Bank 1	<p>Risks related to money laundering and the financing of terrorism are enhanced in VCS</p> <p>The report suggests “a conceptual framework for understanding and addressing the anti-money laundering/countering the financing of terrorism (AML/CFT) risks associated with one kind of internet-based payment system: virtual currencies”</p> <p>This is why EUROPOL, the EU’s law enforcement agency, has called for police to be given greater powers to identify criminals using crypto-currencies to launder money on the internet</p> <p>or virtual currency schemes in general. For example, the German Federal Financial Supervisory Authority (BaFin) supervisor, the Banque de France and the Dutch financing terrorism, the lack of supervision, price fluctuations and security risks</p>		
European Central Bank 2	<p>and money laundering as a result of its high degree of anonymity.</p> <p>could represent a challenge for public authorities, given the legal uncertainty surrounding these schemes, as they can be used by criminals, fraudsters and money launderers to perform their illegal activities</p>	<p>The scheme has been surrounded by some controversy, not least because of its potential to become an alternative currency for drug dealing</p> <p>Sometimes it is linked to its potential for becoming a suitable monetary alternative for drug dealing</p>	
European Central Bank 3	<p>given that terrorists and other criminal groups are currently able to transfer money within virtual currency networks by concealing the transfers or by benefiting from a certain degree of anonymity on such exchange platforms.</p>	<p>More recent digital currencies, which are based on more sophisticated distributed ledger and block chain technology, have a large array of uses that go beyond payment purposes¹⁵, including for example, online casinos In the light of the above</p>	

	A : Inappropriate Practice	B : Payment in Dark Markets	C : Bitcoin is A Scam
European Central Bank 3	consistent with the FATF's recommendations, to regulate virtual currencies from the anti-money laundering and counter-terrorist financing perspectives, they should not seek in this particular context to promote a wider use of virtual currencies		
Federal Bureau of Investigation 1	Bitcoin virtual currency to collect ransom payments CryptoWall was the first ransomware variant that only accepted ransom payments in Bitcoin		
Federal Bureau of Investigation 2			Victims not receiving their crypto-currency mining equipment or mining contracts after they paid for them. Victims sending high performance computers to crypto-mining datacenters to join others in a mining pool, only to be scammed by the operators.
Federal Reserve Bank		We examine patterns of general usage together with usage by Satoshi Dice, the largest online gambling service using Bitcoin as the method of payment For the period for which we have data for Satoshi Dice, most of the transactions involving less than U.S.\$100 equivalent value can be attributed to the online gambling service. ⁸ For the period for which we have data for Satoshi Dice, almost all of these small value transactions seem to have been related to the online gambling service Silk Road, an online marketplace mainly for illegal activities, is founded.	

	A : Inappropriate Practice	B : Payment in Dark Markets	C : Bitcoin is A Scam
Reserve Bank of New Zealand 2	Bitcoin has been subject of scrutiny due to ties with illicit activity	FBI shuts down the 'Silk Road' online black market and seized 144,000 bitcoins Why spend a currency that might go up in value ten or a hundred times (bitcoin) when you can spend one that won't? (dollars) people don't. The only time people do use bitcooms is when they can't use dollars (or euros or yuan)--when they want to do something illegal. Things like buying drugs, gambling online, and evading capital controls. Indeed, 60 percent of <i>all Bitcoin activity</i> happens on the gambling site Satoshi Dice.	Entities that provide (or facilitate) crypto-currency platforms or instruments are captured under laws relating to money laundering and countering the financing of terrorism (AML/CFT legislation)
Reserve Bank of New Zealand 3	On the contrary, banks have been reported to close down accounts associated with bitcoin operations, apparently because of concerns about them being used for moneylaundering		There are also reports of a cyber-attack that infects computers to mine cryptocurrency by installing a currency 'miner' without the user's knowledge. The attack allows computers to operate while mining for crypto-currency in the background.
Reserve Bank of New Zealand 4	Money laundering is a common financial crime in the crypto-currency domain due to pseudonymity and a lack of regulation (ECB 2012, European Banking Authority, Federal Bureau of Investigation 2012) Online gambling has been another prominent source of transactions for crypto-currencies. In a fascinating study using cluster analysis, Meiklejohn et al. (2016) undertook transactions with entities known to accept bitcoins and then used the resultant addresses to classify transactions on the Bitcoin blockchain. They found that around 64 percent of Bitcoin accounts have never been used and 60 percent of transaction activity occurs through gambling	Anonymity is of obvious value to individuals undertaking illegal transactions, such as those associated with trade in illegal drugs. Silk Road used bitcoins to settle transactions and had an estimated revenue of USD1.2 billion annually (Ali et al., 2015)	

	A : Inappropriate Practice	B : Payment in Dark Markets	C : Bitcoin is A Scam
Reserve Bank of New Zealand 4	Perceptions of anonymity have also created a demand for such currencies to facilitate illegal transactions, but the anonymity embodied in crypto-currencies has been overstated.		
Reserve Bank of Zimbabwe	Proceeds from drugs, smuggling, money laundering are valued in Bitcoins which cannot be traced It has been reported that hackers are demanding Bitcoins as ransom for release of information that they would have hacked from governments and corporates.		
U.S Government Accountability Office 1	Further, law enforcement agencies have taken actions against parties alleged to have used virtual currencies to facilitate money laundering or other crimes. Examples of illegitimate uses include money laundering deter and prosecute criminals who use virtual currency systems to launder money (that is, move or hide money that either facilitates or is derived from criminal or terrorist activities	Examples of illegitimate uses include money laundering and purchasing illegal goods and services using virtual currencies.	in July 2013, the Securities and Exchange Commission (SEC) charged an individual and his company with defrauding investors through a bitcoin-based investment scheme SEC charged an individual and his company, Bitcoin Savings and Trust, with offering and selling securities in violation of the antifraud and registration provisions of securities laws.
U.S Government Accountability Office 1	This group has conducted computer forensics and other investigative activity on various virtual currencies and made arrests of individuals who have used virtual currencies as part of their criminal activities.		Specifically, SEC alleges that the founder and operator defrauded investors through a bitcoin-denominated Ponzi scheme. The founder and operator allegedly promised investors up to 7 percent weekly interest. However, he allegedly used bitcoins from new investors to make purported interest payments and cover investor withdrawals on outstanding trust investments, diverted investors' bitcoins for day trading in his personal account on a bitcoin currency exchange, and exchanged investors' bitcoins for U.S. dollars to pay for personal expenses.
U.S Government Accountability Office 2	FinCEN recognizes money laundering vulnerabilities in virtual currencies		

	D : Can be Manipulated	E : Easily Attacked by Cyber Fraud
Bank of England	Bitcoin users do not have to disclose who they are.	More substantially, distributed systems are subject to a risk of system-wide fraud if the process of achieving consensus is compromised. Cryptocurrency schemes, for example, are currently designed such that a would-be attacker would require sustained control of a majority of the total computer power across the entire network of miners.
Bank of Japan 2		However, we should be aware about the security issues including hacking when using public-type blockchain. if the public-type blockchain becomes beyond the role of Bitcoin and be utilized as basic social infrastructure, this would more likely induce cyberattacks on the blockchain.
Bank of Japan 3	In order for any asset to be used and accepted as currency, it must have sufficient "trust" among a wide range of users. In this respect, "bitcoin" attempts to create a "chain of trust" from scratch, but this requires substantial costs for the electric power needed to verify transactions called "mining" and to manage encryption keys.	Also, in the practice of bitcoin transactions, encryption keys have sometimes been entrusted to a third party in a centralized manner, but there have been some incidents such as the failure of Mt. Gox in 2014. In this case, people tried to avoid the cost of managing keys accompanying decentralized-type information processing by entrusting their keys to a third party, Mt. Gox. But their trust was destroyed by the misconduct of the third party.
Deutsche Bundesbank 1	Anonymous transfers of assets of the kind seen on public DLT platforms (public ledgers) do not allow participants to be identified. Anti- money laundering legislation, however, states that it must be possible to unambiguously identify natural and legal persons. This requirement to “know your customer” means ascertaining the identity of network participants, which is why an application like Bitcoin - where transactions take place anonymously - is ineligible.	

	D : Can be Manipulated	E : Easily Attacked by Cyber Fraud
Deutsche Bundesbank 2		<p>Besides, an electronic payment instrument which has all the features of cash would be a dream come true for everyone operating in the shadow economy, as well as for terrorists. Initial indications of such a development have already been observed in connection with bitcoins and ransomware.</p> <p>With bitcoins, it has already crystallized that not only technological security but also protection from theft is key in this context.</p>
European Central Bank 1	Other actors that have appeared are “tumblers”, which provide a service for further increasing the anonymity of the payer by making it more difficult to find out where the virtual currency transaction came from	some of the vulnerabilities of the PoW system, such as the possibility of manipulation through a (temporary) monopoly on mining (the 51% attack ¹⁰) and the high energy consumption.
European Central Bank 1	<p>Lack of transparency can easily be exploited for fraudulent activities.</p> <p>As the real beneficiaries cannot be identified, such frauds are highly facilitated.</p> <p>counterparty risk associated with the anonymity of the payee</p> <p>investment fraud risk related to the lack of transparency</p>	Those failures or hacking attacks can occur at individual level (loss or theft of private cryptographic keys or user credentials) or on a wider scale (disruption to, or hacking of, the technical infrastructure of the key actors)
European Central Bank 2		<p>On other occasions, users have claimed to have suffered a substantial theft of Bitcoins through a Trojan that gained access to their computer</p> <p>Speculations regarding the future value of the currency and history of cyberattacks suffered in the virtual community.</p>


	D : Can be Manipulated	E : Easily Attacked by Cyber Fraud
Federal Reserve Bank	<p>To our knowledge, a bitcoin has no legal tender status in any jurisdiction at the time of this writing.</p> <p>one cannot directly observe how bitcoins change ownership</p> <p>In this particular case, one cannot deduce how many entities were involved in the transaction.</p>	
Reserve Bank of New Zealand 3		<p>Theoretically, bitcoin blockchain is vulnerable if more than 50 percent of computer processing power for bitcoin is controlled by a single individual or organisation, but it is not vulnerable to a cyber-attack on a particular user.</p> <p>crypto-currencies such as bitcoin have been specified by cyber attackers as the preferred mode of payment for cyber-attack ransoms</p>
Reserve Bank of New Zealand 4		<p>Third, cryptocurrency exchanges and even the providers of digital wallets might be susceptible to fraud.</p>
	F : Involving Risk	G : Can be Used to Prevent Fraud
Bank of England	<p>, this creates an incentive for other miners to either drop out or to join the first in a pool, eventually leading to the pool controlling a majority of the network's computing resources (and so expose the system to the risk of fraud). Complete analysis of these settings is not yet complete,(3) but research done to date does suffice to illustrate that the incentives surrounding fraud prevention in digital currency networks have not been fully explored.</p>	
Bank of Japan 1	<p>On the other hand, in order to ensure stability of payment and settlement systems, it should be noted that the entry of service providers from a range of sectors and the use of the internet have generated new risks and changes in risk profile.</p>	

	F : Involving Risk	G : Can be Used to Prevent Fraud
Deutsche Bundesbank 2	Bitcoin owners must trust their own hardware (PC, notebook, tablet, smartphone and the software installed on the respective device) and/or service providers that “store” and manage bitcoins. Of course, security problems may be remedied over time through innovation	
European Central Bank 1	<p>Users are exposed to losses resulting from fraud organised by such actors, from theft or from the bankruptcy of these entities.</p> <p>European Banking Authority issued a warning to consumers on a series of risks deriving from buying, holding or trading virtual currencies such as Bitcoin</p>	
European Central Bank 2	<p>However, it is clear that they can also pose risks for their users, especially in view of the current lack of regulation</p> <p>these schemes are also subject to legal uncertainty and fraud risk, as a result of their lack of regulation and public oversight.</p> <p>Therefore, although the current knowledge base does not make it easy to assess whether or not the Bitcoin system actually works like a pyramid or Ponzi scheme, it can justifiably be stated that Bitcoin is a high-risk system for its users from a financial perspective</p>	
European Central Bank 3	The use of virtual currencies also poses greater risks than traditional means of payment in the sense that the transferability of virtual currency relies on the internet and is limited only by the capacity of the particular virtual currency’s underlying network of computers and IT infrastructure.	

	F : Involving Risk	G : Can be Used to Prevent Fraud
Federal Reserve Bank	<p>recent developments suggest that Bitcoin operations may involve risks whose nature and proportion are little</p> <p>Mt. Gox, the largest bitcoin exchange, filed for bankruptcy in February 2014 after the announcement of a mysterious disappearance of bitcoins valued at almost U.S.\$500 million.</p>	
Reserve Bank of New Zealand 3		<p>The use of blockchain in insurance can lower operational costs through reduced duplication of processes, counterparty risks, and increased automation. DLT can facilitate sharing of information to reduce fraud, for example between insurer and hospitals for health insurance, or between insurer and weather experts for crop insurance.</p> <p>The use of blockchain in insurance can lower operational costs through reduced duplication of processes, counterparty risks, and increased automation. DLT can facilitate sharing of information to reduce fraud, for example between insurer and hospitals for health insurance, or between insurer and weather experts for crop insurance.</p>
Reserve Bank of New Zealand 4		<p>Second, cryptography is used to secure the transaction ledgers of the system, ensuring that people cannot fraudulently tamper with their cryptocurrency balances.</p> <p>There are currently no mechanisms to reverse transactions in the cryptocurrency domain. This is an advantage for merchants: in current payment systems involving credit cards, merchants are susceptible to fraud and may have transactions reversed after customers have received goods/services</p>

	F : Involving Risk	G : Can be Used to Prevent Fraud
U.S Government Accountability Office 1	<p>According to CFTC, such circumstances could include virtual-currency derivatives emerging or being offered in the United States or CFTC becoming aware of the existence of fraud or manipulative schemes involving virtual currencies.</p> <p>Computer Crime and Intellectual Property Section stated that virtual currencies can be attractive to entities that seek to facilitate or conduct computer crimes over the Internet, such as computer-based fraud and identity theft.</p>	
U.S Government Accountability Office 1	<p>SEC's Office of Investor Education and Advocacy has issued two investor alerts on virtual currencies.</p> <p>The first alert, issued in July The second alert, issued in May 2013, warned about fraudulent investment schemes that may involve bitcoin and other virtual currencies</p> <p>For example, notable examples of bitcoin thefts by computer hackers have occurred in the past few years, including the theft of more than 35,000 bitcoins from a virtual wallet provider in April 2013 and 24,000 bitcoins from a bitcoin exchange in September 2012</p>	

Appendix F – Framework Matrix of Twitter Users and Problem Formulation 2

	A : As a Tool to Commit Fraud	B : Bitcoin is a Scam
1234goplay		Feds Begin To Crack Down On Fraud As Bitcoin Soars https://t.co/y9S1qJMIAI https://t.co/yDsg8Ofmm2
BitcoinInsight0		Automata Podcast: Neal Reiter of IdentityMind on Crypto Fraud Risk
Bitfinexed	If you run a Bitcoin exchange and the Chief Financial Officer of a 'security' you list publicly admits to thinking about committing fraud and admits to what sounds like a ponzi scheme to anyone with a brain... If you don't delist their illegal security... you are in trouble.	
BrianBrownNet		"Bitcoin Might Be a Fraud, Might Be the Future" @DailyBrian
Crypto_Newz		#Bitcoin risks: Bitconnect shut down hurt crypto #Market; watch out for other scams https://t.co/XCFqui56Vw
CryptoCurrent		What steps should consumers take to safeguard themselves from Bitcoin fraud? https://t.co/sWsjDUgvon
DailyBrian		"Bitcoin Might Be a Fraud, Might Be the Future"
mikenavid18	@Cryptopia_NZ YOU ARE A FRAUD! I SENT THOUSANDS OF DOLLARS OF MUSICOIN AND BITCOIN CASH TO YOUR WALLETS AND NOTHING HAS SHOWED UP. @Cryptopia_NZ IS A FRAUD - STAY AWAY!!	
SportsbookBTC		CRYPTO  Bitcoin risks: Bitconnect shut down hurt crypto market; watch out for other scams https://t.co/UCCrrEiuL
Valustks1	It appears @bitcoin Has been HACKED IT should be REPORTED and Blocked #Scamsters Committing #FRAUD #Bitcoin is #CensorshipRESISTANT	

	C : Can be Manipulated	D : Fraudulent Users
byourist		@rogerkver see you should not have tried to undermine the real #bitcoin #Bcash or #bitcoincash is centralized mined by 1 large miner fraud @BKBrianKelly @CNBCFastMoney ver is also a felon so don't let him promote his bullshit
mikenavid18		@Cryptopia_NZ YOU ARE A FRAUD! I SENT THOUSANDS OF DOLLARS OF MUSICOIN AND BITCOIN CASH TO YOUR WALLETS AND NOTHING HAS SHOWED UP. @Cryptopia_NZ IS A FRAUD - STAY AWAY!!
petergo99037185	<p>BITCOIN probably we'll get a 3 step drop, see how far it goes DOWN..</p> <p>Losing followers, mostly COIN junkies, can't tell why they followed to start with,</p> <p>I am 100% against Pyramids and Fraud</p> <p>BTC BTC= BTC/USD BITCOIN 13,431 - 818,</p> <p>Lost 14,000 early this Eve, now about to lose 13,000</p> <p>Almost everyone that bought the COIN after DEC 15th is now losing Money</p> <p>Where is it all gone, THE WHALES cashed in, the rest hold the loses</p> <p>That is how PYRAMIDS work, BIG FRAUD.</p>	
Valustks1		It appears @bitcoin Has been HACKED IT should be REPORTED and Blocked #Scamsters Committing #FRAUD #Bitcoin is #CensorshipRESISTANT

	E : No Regulation (Government and Bank)	F : Can be Used to Prevent Fraud
BitcoinBolt	This week's Bitcoin crash was all about fraud and regulation - The Verge https://t.co/e4OLynVfnt #bitcoin	New System to Combat Fraud, Wasted Resources in Recruiting https://t.co/IVDk1IYPCb #bitcoin
Bitcoinized	This week's Bitcoin crash was all about fraud and regulation - The Verge	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have.
CogitoErgoCode		Ron Paul: '#Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have.
CoinLook	This week's Bitcoin crash was all about fraud and regulation	
coinspectator	This week's Bitcoin crash was all about fraud and regulation #blockchain #crypto #altcoin	
Crypto_Newz	This week's #Bitcoin crash was all about fraud and regulation https://t.co/kJrtgn0sPq	
CryptoBrokerIO	This week's Bitcoin crash was all about fraud and regulation - The Verge - https://t.co/7eIQat3aRC	
cryptominernews	Bank of America Survey Labels Bitcoin a 'Fraud' #news #bitcoin SEC Files Fraud Charges in First Week of 2018 #news #bitcoin	
Cryptow1re		Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have
darkisdarkn1	This week's Bitcoin crash was all about fraud and regulation	
devnullius	This week's Bitcoin crash was all about fraud and regulation	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have
DigitalDoshNews	This week's Bitcoin crash was all about fraud and regulation	
RoccoDallas	This week's Bitcoin crash was all about fraud and regulation - The Verge https://t.co/G8IKCqfYet	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have.
SportsbookBTC	#Bitcoin This week's Bitcoin crash was all about fraud and regulation https://t.co/O6Pk4nFMcw	

	E : No Regulation (Government and Bank)	F : Can be Used to Prevent Fraud
petergo99037185	<p>We are all in this GAME to make MONEY</p> <p>I do \$DAX LIVE daily 5 years, ++\$\$</p> <p>You may do \$SPX BITCOIN or @CL.1 wti Crude OIL</p> <p>As long as it is Legal, I will Cheer you on,</p> <p>FRAUD gets AUTO FED Term, no parole.</p>	
politicalHEDGE	<p>Published Precisely on October 23, 2017 8:22 pm Saudi Prince Awaleed bin Talal Calls #Bitcoin a Total Fraud https://t.co/uFv7MQ7kwh #bitcoin</p>	
WuWeiTaoist		Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have.'
	G : Caused by Other Systems	H : Future Financial Technology
Bitcoinized	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have.'	
Bitfinexed	<p>@ShaharAbrams By using Tether they can effectively use their fraud on every exchange that uses tether, which is all altcoin exchanges.</p> <p>That's why altcoins spike too, they print money to buy bitcoin and altcoins.</p>	
BitsandBights		Bitcoin: JP Morgan Chase's Jamie Dimon says he regrets calling bitcoin a "fraud" https://t.co/9p77E77zK1 #Bitcoin #blockchain via @courtneynoelg
BrianBrownNet		"Bitcoin Might Be a Fraud, Might Be the Future" https://t.co/MutTgiRer8 @DailyBrian

	G : Caused by Other Systems	H : Future Financial Technology
Strategia		<p>FACEOFF between Ripple CEO and ethereum co-founder. # Bitcoin is : "Cash will be valuable still. That may take on different forms". Joe Lubin, Ethereum Co-founder.</p> <p>FACEOFF between Ripple CEO and ethereum co-founder. # Bitcoin is : "Complicated and maybe the future as a store of value." Brad Garlinghouse, Ripple CEO.</p>
AlexGheorghiu3	<p>The only fraud in this equation is for BTC to be claiming to be Bitcoin. It might be better than Bitcoin, who knows, but it most definitely is not Bitcoin, and the fraud happened when Bitcoin Segwit retained the BTC ticker and confused the users.</p> <p>I know you'll hate my answer but it's simple, because BCH is Bitcoin. But think about it this way... what is the definition of Bitcoin, and then compare the features of both BCH and BTC and see which one resembles the definition. If one doesn't it means it's a fraud.</p>	
BTCNewsUpdates	<p>The new Blockstream/Lightning Labs narrative is to say that their proprietary "Lightning Network" (still mythical) technology IS Bitcoin. It is a false narrative. You support this fraud, be prepared for the consequences.</p> <p>Segwit is only a hook that enables Blockstream Corp/Lightning Labs to plug their fee paying techs into BTC. As BTC itself is crippled, users are forced into their fee paying solutions. It is a corruption of the Bitcoin project</p>	

	G : Caused by Other Systems	H : Future Financial Technology
BTCNewsUpdates	Too many people have known for a long time that Legacy Bitcoin (BTC) is unusable while aggressively denying it in public. It is the biggest scandal in crypto #fraud	
byourist	<p>@rogerkver see you should not have tried to undermine the real #bitcoin #Bcash or #bitcoincash is centralized mined by 1 large miner fraud @BKBrianKelly @CNBCFastMoney ver is also a felon so don't let him promote his bullshit</p> <p>Well said sir. Only buy ICOs that you personally know the founders other than #BCH \$btc #ETH and maybe monero will out perform strange coins alts whatever they call shitcoins such as the fake #bitcoin or "bitcoincash" or "Bcash" fraud coin</p> <p>@Bitcoin Drop your fraud #bitcoincash is NOT #bitcoin it's called #Bcash with no developers on board and @rogerkver is a convicted felon</p>	
CogitoErgoCode	Ron Paul: '#Bitcoin Should Be Legal, as Long as There's No Fraud' - "I abhor the system that we have.	
CoinLook		JP Morgan Chase CEO Regrets Calling Bitcoin a Fraud
coinspectator	Peter Thiel-Backed Startup Helps Investors Sue Cryptocurrency Fraud #bitcoin #crypto #altcoins	
crypto_savior		Jamie Dimon regrets calling bitcoin a 'fraud' https://t.co/s6p5wrnWNi #bitcoin \$BTC \$ETH #blockchain
CryptoCurrent		Bitcoin latest: JPMorgan CEO Jamie Dimon 'regrets' calling cryptocurrency a fraud https://t.co/C1xYqzPtXY #cryptocurrency #google #news #cryptocurrency
Cryptow1re	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - "I abhor the system that we have	
DailyBrian		"Bitcoin Might Be a Fraud, Might Be the Future"

	G : Caused by Other Systems	H : Future Financial Technology
devnullius	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have	
INeedRocksNMoon	\$hush is a fraud lol they market \$btch as a bitcoin fork, yet it isn't anything other than a shit airdrop token. their dev got paid to do some things on \$btcp as a bounty dev yet publically trashes it, to line his own pockets...protect ya money!	
JacekSalaj		Jamie Dimon Admits He Regrets Calling Bitcoin A Fraud https://t.co/j3Vf1k9Giz
jidept	FRAUD ALERT! This Mobilink ICO is fraud! #UAH #UAHPAY @mobilinkcoin @ICODrops @ICOnews @IcoRating @Cointelegraph @johntalley105 @coinjinja #token #bitcoin #cryptocurrency #ICO #MOBILINK-COIN ##mobilinkcoin https://t.co/qxUWAUEibR	
oskaaay		Recap: #MyCDApp: JP Morgan Jamie Dimon Regrets his "Bitcoin Is a Fraud" Statement https://t.co/TYyyZyBEA7
LetsTalkPaymnts		10 #FinTech Predictions for 2018 https://t.co/7a3wx08Ky1 #cryptocurrency #openbanking #RegTech #Banks #ICOs #Bitcoin #Fraud #Cybersecurity https://t.co/XHqASGkomc
patmillertime	@bhec39 That looks like these Lokad folks are promoting fraud by saying #bcash is Bitcoin @Vemundzo @brianchoffman Scammer FUD. We see you promoting fraud that bcash is Bitcoin. Noted	
Remi_Vladuceanu	Giga Watt ICO is the Latest Project to Commit Securities Fraud	
RoccoDallas	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have.	JP Morgan Chase CEO Regrets Calling Bitcoin a Fraud https://t.co/RqWjumKn6R
WuWeiTaoist	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - 'I abhor the system that we have.	JPMorgan CEO: Bitcoin Not a Fraud - https://t.co/8FMgca66sQ

	I : Still Need to be Developed	J : Understand Bitcoin Technology
Strategia	FACEOFF between Ripple CEO and ethereum co-founder. # Bitcoin is : "An experiment in monetary theory. It's a breakthrough..." Joe Lubin, Ethereum Co-founder.	
BitcoinInsight0		JPMorgan CEO: Bitcoin Not a Fraud https://t.co/LFIFqc0WET
BitcoinWrld	Ron Paul: 'Bitcoin Should Be Legal, as Long as There's No Fraud' - "I abhor the system that we have.	
BitsandBights		Bitcoin: JP Morgan Chase's Jamie Dimon says he regrets calling bitcoin a "fraud" https://t.co/9p77E77zK1 #Bitcoin #blockchain via @courtenoelg
CogitoErgoCode		"The #blockchain is real. You can have #crypto yen and dollars and stuff like that. "
Crypto_Newz		JPMorgan CEO: #Bitcoin Not a Fraud https://t.co/BXqr4Ss0nf
Cryptow1re		@reddit: JP Morgan Chase CEO, Regrets Calling Cryptocurrency Fraud, but still Not Interested in Bitcoin
devnullius		JP Morgan Chase CEO, Regrets Calling Cryptocurrency Fraud, but still Not Interested in Bitcoin https://t.co/5Bus1BsQo8
LetsTalkPaymnts	10 #FinTech Predictions for 2018 https://t.co/7a3wx08Ky1 #cryptocurrency #openbanking #RegTech #Banks #ICOs #Bitcoin #Fraud #Cybersecurity https://t.co/XHqASGkomc	
patmillertime		For someone who claims to be anti-war, he certainly made a mistake in choosing perpetual war with the #Bitcoin blockchain protocol... which literally cannot die...
waq_azeem		JPMorgan chief backtracks on Bitcoin 'fraud' claim but remains dubious https://t.co/vfqx3OHIqX #Bitcoin \$ETH \$BTC

Appendix G – Official Reports’ Covers

Bank of England

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Quarterly Bulletin 2014 Q3

Innovations in payment technologies and the emergence of digital currencies

By Robleh Ali of the Bank’s Financial Market Infrastructure Directorate, John Barrdear of the Bank’s Monetary Assessment and Strategy Division, and Roger Clews and James Southgate of the Bank’s Markets Directorate.^[1]

- Modern electronic payment systems rely on trusted, central third parties to process payments securely. Recent developments have seen the creation of digital currencies like Bitcoin, which combine new currencies with decentralised payment systems.
- Although the monetary aspects of digital currencies have attracted considerable attention, the distributed ledger underlying their payment systems is a significant innovation.
- As with money held as bank deposits, most financial assets today exist as purely digital records. This opens up the possibility for distributed ledgers to transform the financial system more generally.

Overview

Money and payment systems are intrinsically linked. In order for an asset to function as a medium of exchange, there needs to be a secure way of transferring that asset — a payment system. And for any system other than the exchange of physical banknotes or coins, a means of recording the values stored is also needed — a ledger. Modern payment systems are computerised and most money exists only as digital records on commercial banks’ accounts.

This article considers recent innovations in payments technology, focusing on the emergence of privately developed, internet-based digital currencies such as Bitcoin. Digital currency schemes combine both new payment systems and new currencies. Users can trade digital currencies with each other in exchange for traditional currency or goods and services without the need for any third party (like a bank). And their creation is not controlled by any central bank. Bitcoin — currently the largest digital currency — was set up in 2009 and several thousand businesses worldwide currently accept bitcoins in payment for anything from pizza to webhosting. Most digital currencies, including Bitcoin, incorporate predetermined supply paths leading to fixed eventual supplies. An overview of how digital currencies work, including the creation of new currency, is included in this article.

Much of the media focus to date has been on the new currencies themselves (such as ‘bitcoins’) and the large price swings that these have experienced.

This article argues, however, that the key innovation of digital currencies is the ‘distributed ledger’ which allows a payment system to operate in an entirely decentralised way, without intermediaries such as banks. This innovation draws on advances from a range of disciplines including cryptography (secure communication), game theory (strategic decision-making) and peer-to-peer networking (networks of connections formed without central co-ordination).

When payment systems were first computerised, the underlying processes were not significantly changed. Distributed ledger technology represents a fundamental change in how payment systems could work. And in principle, this decentralised approach is not limited to payments. For instance, the majority of financial assets such as shares or bonds already exist only as digital records, stored on centralised databases.

A companion piece to this article focuses in more detail on the economics of digital currencies. It considers the extent to which they serve the roles of money, the incentives embedded in the design of the schemes and touches on some of the risks they may pose to the monetary and financial stability of the United Kingdom if they reached significant scale.

[Click here for a short video that discusses some of the key topics from this article.](#)

[1] The authors would like to thank Victoria Clark, Denny Eckstein and Tom Ludlow for their help in producing this article.

Bank of Japan 1

BOJ
Reports & Research Papers

Payment and Settlement Systems Report



Bank of Japan
March 2016

Bank of Japan 2

August 2016
Payment and Settlement Systems Department
Bank of Japan

Summary of the Forum on Payment and Settlement Systems on March 17 and 18, 2016¹

(This is an English translation of Japanese original released on April 13, 2016)

【Executive Summary】

The Bank of Japan held the "Forum on Payment and Settlement Systems" on March 17 and 18, 2016¹. The agenda of the Forum focused on retail payment issues on March 17 and on wholesale payment issues on March 18, respectively.

On March 17, Governor Haruhiko Kuroda made opening remarks entitled "Innovations in Payments and FinTech: The Central Bank's Perspective".² On March 18, Executive Director Shigehiro Kuwabara also made opening remarks entitled "Enhancement of Payment and Settlement Systems and the Bank of Japan".³

The presentations on March 17 were focused on the issues regarding retail payment innovation, digital currencies and their background technologies (i.e., blockchain and distributed ledger technologies) as well as their impacts on retail payments. They also illustrated the issues regarding the applications of those technologies to various financial businesses.

After the presentations mentioned above, the participants discussed wide-ranging issues, including the following:

- 1) the benefits of blockchain and distributed ledger technologies
- 2) the challenges in applying blockchain and distributed ledger technologies to wide-ranging financial businesses
- 3) the issues regarding data security (e.g., the risks of cyber-attacks and leakages of private information)

¹ In advance of the forum, the Bank openly announced to accept the application for making a presentation at or participate in the Forum. The Bank received many applications from wide-ranging firms, including non-financial institutions related to payment businesses and FinTech. (Please see the appendix 1 and 2 for the list of participant companies and organizations.)

² Available at http://www.boj.or.jp/en/announcements/press/koen_2016/data/ko160317a.pdf

³ Available at http://www.boj.or.jp/en/announcements/press/koen_2016/data/ko160318a.pdf

Bank of Japan 3



November 18, 2016
Bank of Japan

FinTech – Its Impacts on Finance, Economies and Central Banking

Remarks at the University of Tokyo - Bank of Japan Joint Conference in Tokyo

on "FinTech and the Future of Money"

Hiroshi Nakaso

Deputy Governor of the Bank of Japan

(English translation based on the Japanese original)

Deutsche Bundesbank 1



Deutsche Bundesbank
Monthly Report
September 2017
2

Monthly Report September 2017

Vol 69
No 9

Deutsche Bundesbank
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ISSN 0418-8292 (print edition)
ISSN 1862-1325 (online edition)

The German original of this *Monthly Report*
went to press at 11 am on 15 September 2017.

Annual and weekly publishing schedules for
selected statistics of the Deutsche Bundes-
bank can be downloaded from our website.
The statistical data are also published on the
website.

The *Monthly Report* is published by the
Deutsche Bundesbank, Frankfurt am Main,
by virtue of section 18 of the Bundesbank
Act. It is available to interested parties free of
charge.

This is a translation of the original German-
language version, which is the sole authorita-
tive text.



Deutsche Bundesbank 2



European Central Bank 1



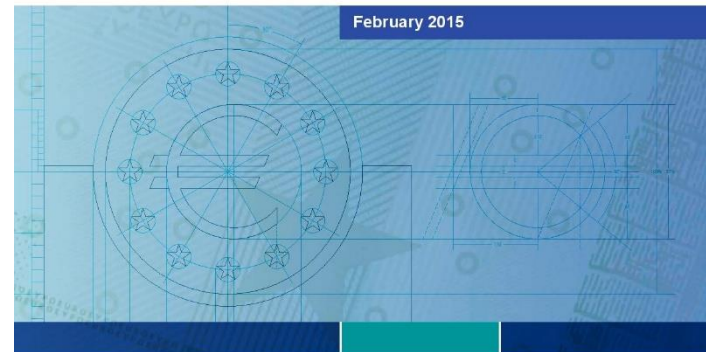
Virtual currency schemes –
a further analysis

International Cash Conference 2017

War on Cash: Is there a Future for Cash?



February 2015



European Central Bank 2



In 2012 all ECB publications feature a motif taken from the €50 banknote.



VIRTUAL CURRENCY SCHEMES OCTOBER 2012

European Central Bank 3



EN

ECB-PUBLIC

OPINION OF THE EUROPEAN CENTRAL BANK

of 12 October 2016

on a proposal for a directive of the European Parliament and of the Council amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing and amending Directive 2009/101/EC

(CON/2016/49)

Introduction and legal basis

On 19 August 2016 and 23 September 2016, the European Central Bank (ECB) received requests from the Council and the European Parliament respectively for an opinion on a proposal for a directive amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing and amending Directive 2009/101/EC¹ (hereinafter the 'proposed directive').

The ECB's competence to deliver an opinion is based on Articles 127(4) and 282(5) of the Treaty on the Functioning of the European Union, since the proposed directive contains provisions falling within the ECB's fields of competence. In particular, the ECB's competence to deliver an opinion is based on Article 127(2) and (5) and Article 128(1) of the Treaty, as the proposed directive contains provisions which have implications for certain tasks of the European System of Central Banks (ESCB), including the promotion of the smooth operation of payment systems, contributing to the smooth conduct of policies pursued by the competent authorities relating to the stability of the financial system and authorising the issue of euro banknotes within the Union. In accordance with the first sentence of Article 17.5 of the Rules of Procedure of the European Central Bank, the Governing Council has adopted this opinion.

1. Observations

1.1. Regulation of virtual currency exchange platforms and custodian wallet providers

1.1.1 The proposed directive expands the list of obliged entities to which Directive (EU) 2015/849 of the European Parliament and of the Council² applies in order to include providers engaged primarily and professionally in exchange services between 'virtual currencies' and 'fiat currencies' (understood in the proposed directive to be currencies declared to be legal tender³) and wallet

¹ COM (2016) 450 final.

² Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC (OJ L 141, 5.6.2015, p. 73).

³ See recital 6 of the proposed directive.

European Central Bank 3

ECB-PUBLIC

incurred by the NCBs that are associated with operating and granting access to the central register.

2. Technical observations and drafting proposals

Where the ECB recommends that the proposed regulation is amended, specific drafting proposals are set out in a separate technical working document accompanied by an explanatory text. The technical working document is annexed to this Opinion and is available in English on the ECB's website.

Done at Frankfurt am Main, 12 October 2016.

[signed]

The President of the ECB
Mario DRAGHI

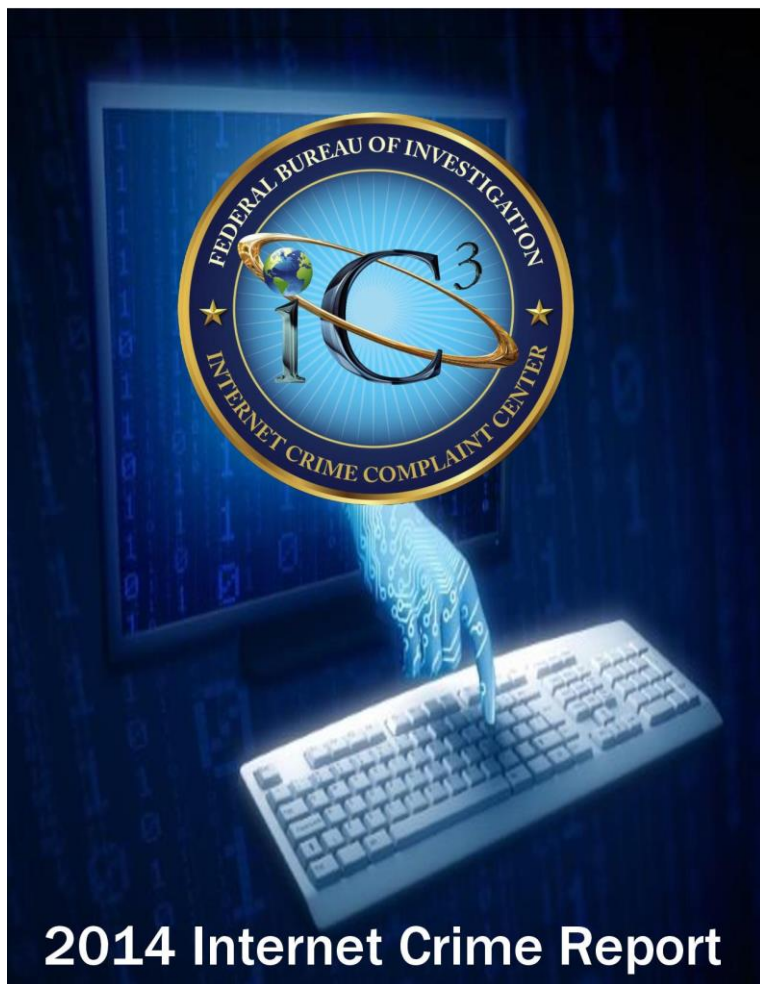
Federal Bureau of Investigation 1



How to Protect Your Networks from RANSOMWARE

This document is a U.S. Government interagency technical guidance document aimed to inform Chief Information Officers and Chief Information Security Officers at critical infrastructure entities, including small, medium, and large organizations. This document provides an aggregate of already existing Federal government and private industry best practices and mitigation strategies focused on the prevention and response to ransomware incidents.

Federal Bureau of Investigation 2



Federal Reserve Bank

Finance and Economics Discussion Series
Divisions of Research & Statistics and Monetary Affairs
Federal Reserve Board, Washington, D.C.

Bitcoin: Technical Background and Data Analysis

Anton Badev and Matthew Chen

2014-104

NOTE: Staff working papers in the Finance and Economics Discussion Series (FEDS) are preliminary materials circulated to stimulate discussion and critical comment. The analysis and conclusions set forth are those of the authors and do not indicate concurrence by other members of the research staff or the Board of Governors. References in publications to the Finance and Economics Discussion Series (other than acknowledgement) should be cleared with the author(s) to protect the tentative character of these papers.

Reserve Bank of New Zealand 1



The evolution of New Zealand's currency

A speech delivered to the Royal Numismatic Society in Wellington

On 5 July 2014

By Geoff Bascand, Deputy Governor and Head of Operations

Reserve Bank of New Zealand 2



4 November 2015

Manager,
BNZ Markets

Email: [REDACTED]

Dear [REDACTED]

On 6 October you made a request under the provisions of section 12 of the Official Information Act, seeking:

a copy of a memorandum prepared by Edwin Budding to the "Payments Oversight Committee" of the Reserve Bank of NZ on Bitcoin in 2013.

The Reserve Bank has decided to release the document to you. No information is being withheld or redacted from the document.

The release of this information meets your request in full. You have the right to seek a review of the Reserve Bank's decisions, under section 28 of the Official Information Act.

Yours sincerely


Angus Barclay
External Communications Advisor

Ref #6330487 v1.0

Reserve Bank of New Zealand 2

MEMORANDUM FOR	POG
FROM	Edwin Budding
DATE	18 February 2014
SUBJECT	Bitcoin
FOR YOUR	Information

This note provides background information on Bitcoin following a NZ Herald article (4 Feb) that an Australian company is planning to set up a Bitcoin ATM in Auckland in Q2 2014¹.

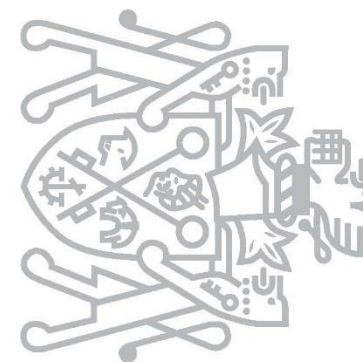
Background facts

- Bitcoin is a peer-to-peer payment system and digital currency introduced as open source software in 2009 by pseudonymous developer Satoshi Nakamoto.
- Bitcoin gained attention in 2013 as hedge funds considered its viability as a tradable asset and as Wall Street banks released research notes about the virtual currency. Additionally, brothers Cameron and Tyler Winklevoss - drew popular attention to Bitcoin after they revealed a sizeable position in the currency.
- It is a cryptocurrency, so-called because it uses cryptography to control the creation and transfer of money. Bitcoin is a purely online virtual currency, unbacked by either physical commodities or sovereign obligation.
- Conventionally, "Bitcoin" capitalised refers to the technology and network whereas lowercase "bitcoins" refers to the currency itself.
- There is a strictly limited supply of bitcoins that only grows at a slow, pre-set rate. Like gold, the only way to get new bitcoins is to "mine" them - where mining means solving computationally-taxing math problems. The invisible hand is plenty easy to see. Solving these math problems doesn't just win new bitcoins for individual miners. It verifies all Bitcoin transactions for the entire network. In other words, Bitcoins are created by a process called mining, in which participants verify and record payments in exchange for transaction fees and newly minted bitcoins.
- Users send and receive bitcoins using wallet software on a personal computer, mobile device, or a web application. Bitcoins can be obtained by mining or in exchange for products, services, or other currencies.
- Bitcoin has been a subject of scrutiny due to ties with illicit activity. In 2013, the US FBI shut down the 'Silk Road' online black market and seized 144,000 bitcoins worth

¹ http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11196633 Bitcoin ATMs allow cash for bitcoins transactions to be made.

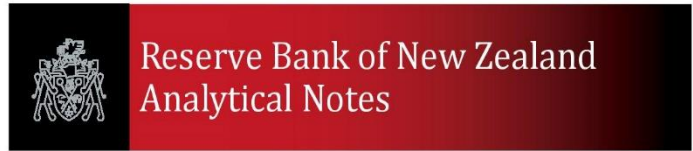
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Reserve Bank of New Zealand 3



RESERVE
BANK
OF NEW ZEALAND
TE POTEA MATUA

Bulletin
Vol. 81, No. 12
November 2018



Crypto-currencies – An introduction to not-so-funny moneys

AN2017/07

Aaron Kumar and Christie Smith

November 2017

Reserve Bank of New Zealand Analytical Note Series
ISSN 2230-5505

Reserve Bank of New Zealand
PO Box 2498
Wellington
NEW ZEALAND

www.rbnz.govt.nz

The Analytical Note series encompasses a range of types of background papers prepared by Reserve Bank staff. Unless otherwise stated, views expressed are those of the authors, and do not necessarily represent the views of the Reserve Bank.



FinTech developments in banking, insurance and FMS

Riki Fujii-Rajani

This article is motivated by the recent rapid growth in technology-enabled innovation in financial services, referred to as 'FinTech'. It explains and gives examples of developments in a number of broad categories of FinTech, and considers their implications for the Reserve Bank as prudential regulator. FinTech has the potential to enhance financial sector efficiency, but may also create new risks to financial sector stability. So far the overall impacts have been small, and for now the appropriate response by the Reserve Bank is limited to increased monitoring of emerging FinTech developments.

1 Introduction

'FinTech' (financial technology) is a term with many meanings. For the purposes of this article, FinTech is defined as "technology-enabled innovation in financial services that could result in new business models, applications, processes or products with associated material effect on provision of financial services" (Financial Stability Board, 2017). Such innovations have not been unusual historically, but the pace and scope of change has been particularly striking over recent years.

This article summarises the range of current FinTech innovations and their implications in banking, insurance¹ and financial market infrastructure (FMI), from the perspective of the Reserve Bank of New Zealand (Reserve Bank) as the prudential regulator and supervisor of banks, insurers, and (soon) FMS² in New Zealand. The implications of FinTech for the Reserve Bank's supervisory responsibilities for AMLCFT³

¹ The term 'insurance' is also used to refer to FinTech activity in the insurance industry.

² The Reserve Bank will have increased oversight powers over systemically important FMs from the current Anti-money laundering and countering the financing of terrorism.

³ Anti-money laundering and countering the financing of terrorism.

Reserve Bank of New Zealand 5



Reserve Bank perspective on payments

A speech delivered to the Payments New Zealand Conference in Auckland

On 11 November 2014

By Grant Spencer, Deputy Governor

Reserve Bank of Zimbabwe



Cybercrime in Zimbabwe and Globally

1. Background

- 1.1. **Cybercrime, also known as Computer crime**, is any crime that involves a [computer](#) and a [network](#). Cybercrime covers any illegal behavior committed by means of, or in relation to, a computer system or network.
- 1.2. Cybercrime is a major component of the Anti Money Laundering and Counter Financing of Terrorism (AML/CFT) concerns. It is on the list of twenty-one prescribed predicate offences as listed by the Financial Action Task Force (FATF).
- 1.3. In Zimbabwe's National Risk Assessment (NRA) Report, of 2015, cybercrime is listed as one of the crimes contributing to the US\$1.8 billion estimated illicit proceeds generated from criminal activity annually in Zimbabwe.

U.S Government Accountability Office 1



United States Government Accountability Office
Report to Congressional Requesters

January 2016

INTERNATIONAL REMITTANCES

Money Laundering
Risks and Views on
Enhanced Customer
Verification and
Recordkeeping
Requirements

GAO-16-65

U.S Government Accountability Office 2



United States Government Accountability Office
Report to the Committee on Homeland
Security and Governmental Affairs,
U.S. Senate

May 2014

VIRTUAL CURRENCIES

Emerging Regulatory,
Law Enforcement,
and Consumer
Protection Challenges

GAO-14-496

