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Blockchain and cryptocurrencies: essential tools in a two-tier financial system

Key points

- This article discusses the current situation in the market of cryptocurrencies and joins the debate about the regulation of these financial innovations.
- It argues that the appearance of cryptocurrencies was a response to market demand for more affordable and more inclusive banking.
- It also argues that distributed ledger technology (DLT) which supports cryptocurrencies and has different characteristics than the technology used by traditional banking could help to create with cryptocurrencies a new, lower cost, more inclusive financial ecosystem separate from the traditional one.
- The two ecosystems (traditional and new one) would form a larger two-tier financial ecosystem, which, overall would be more inclusive and more affordable. Also, it would be more effective in containing contagion and major economic disruption during future financial crises.
- The current reliance on a single, ever growing, and immensely complex financial ecosystem is not sustainable longer term as systemic risks grow with the system and there are no mechanisms available to fully eliminate these risks. The costs of regulating the current market architecture are also excessively high.

1. Introduction

The announcement by Facebook[1] on June 18, 2019 of its plans to launch a new cryptocurrency shook the markets and caused renewed global attention to cryptocurrencies. Facebook "Libra", which will be an asset-backed cryptocurrency using the blockchain technology, is to be launched in 2020, and Facebook hopes that it will be widely accepted

[1] For more details about Facebook's cryptocurrency proposal visit https://libra.org, the official webpage of the new currency where Facebook published also a White Paper with the proposed technical standards.

and be used by people to "….send, receive, spend, and secure their money"[2]. Libra will be supported by a basket of real currencies and assets, which will offer it intrinsic value, and, Facebook hopes, also price stability[3]. The announcement gave a significant boost to the valuations of the other cryptos, which were already recovering from the 2017/18 crash. By June 26 Bitcoin, the market leader, surged above $13,000 registering an overall return of more than 250 percent for the year[4]. Other cryptocurrencies followed with market analysts seeing evidence of a repetition of the 2017 market rally.

Public authorities and regulators around the world, especially those in big economies, continue to be cautious against cryptocurrencies and associated assets (the "crypto-assets") considering them risky and dangerous for investors and consumers. The Libra announcement was followed by public requests to Facebook to halt the development of the currency until regulators had a chance to assess the situation[5], scheduling of public hearings[6], and assurances that the highest standards of regulation would apply to the new currency[7]. There are also expressed concerns about the impact on the global financial system[8] and the threat it may pose to traditional currencies[9]. The reactions to Libra follow a long trail of public negative statements about the rest of cryptocurrencies. The Financial Stability Board (FSB) in a 2018 report on crypto-assets highlighted "significant concerns, including consumer and investor protection, market integrity and money laundering/terrorism financing, among others"[10]. The Bank of International Settlements (BIS) in a 2017 report identified several risks linked to Distributed Ledger Technology (DLT), which underpins cryptocurrencies including, *inter alia* operational and security risks, risks related to data integrity, immutability and privacy, and to the absence of an effective legal framework[11]. In the European Union, the European Banking Authority in a 2014 Opinion on 'virtual currencies',

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[2] *Ibid.*

[3] *Ibid.*

[4] See Daniel Shane and Siddarth Shrikanth (2019) "Bitcoin surges over $13,000, boosted by 'Facebank'", *Financial Times*, June 26.

[5] Relevant statements were issued on several occasions by the US House Financial Services Committee Chairwoman, Maxine Waters (see e.g. Sylvan Lane (2019) "House panel to hold hearing on Facebook cryptocurrency project", *The Hill*, June 24.

[6] *Ibid.*

[7] According to Mark Carney, the Governor of the Bank of England, if Facebook acquires significant market attention "it would instantly become systemic and will have to be subject to the highest standards of regulation" (See Chris Giles (2019) "Carney keeping 'open mind' to Facebook backed digital currency", *Financial Times,* June 19.

[8] Patrick McHenry the top Republican Representative to the US House Financial Services Committee spoke about Project Libra's "potential unprecedented impact on the global financial system." (op.cit.5).

[9] The extent of the potential threat to the US dollar by posed Libra was clearly illustrated in US Rep. Waters's statement: "We've got to protect our consumers. We just can't allow them to go to Switzerland with all of its associates and begin to compete with the dollar." (Zack Seward (2019) "Rep. Waters: US Can't Let Facebook's Crypto 'Compete With the Dollar", *coindesk.com*, June 20.

[10] Financial Stability Board "Crypto-assets", Report to the G20 on work by the FSB and standard-setting bodies, 16 July 2018, p.6, available at http://www.fsb.org/wp-content/uploads/P160718-1.pdf

[11] Bank of International Settlements, Committee on Payments and Market Infrastructures, (2017)"Distributed ledger technology in payment, clearing and settlement, An analytical framework" February.

identified “approximately 70 risks” to users, market participants, financial integrity, payments systems and regulators[12] and issued warnings to consumers[13]. In 2018, EU included cryptocurrencies into the scope of its updated Anti-money Laundering Directive, while a study for the European Parliament suggested further steps including ban and criminalisation of certain aspects of cryptocurrencies[14]. The European Central Bank has issued guidance about risks since 2012[15].

In the United States (US) regulators and the Fed have issued several warnings listing a number of risk factors associated with “cryptos[16]”. Regulators have filed several court cases against crypto issuers, traders and exchanges for violations of US laws[17] and have intensified their efforts to bring the crypto ecosystem within the scope of financial regulation[18]. A 2017 survey of state and provincial securities regulators by the North American Securities Administrators Association (NASAA) showed that 94 percent of the surveyed regulators believed that cryptocurrencies entailed a “high risk of fraud”[19]. In other developed countries similar approaches have been taken. Cryptocurrencies (also called “altcoins” or “tokens”) have been described as: “extremely risky[20]”, “unreliable”, “fraudulent”, “threat” and other similar words.

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[12] See European Banking Authority (2014) “Opinion on ‘Virtual Currencies’”, EBA/Op/2014/08, 4 July.

[13] See e.g. The European Supervisory Authorities for securities (ESMA), banking (EBA), and insurance and pensions (EIOPA) joint warning to consumers in 2018 (“Joint ESAs Warning on Virtual Currencies”, 12 February 2018).

[14] The study focuses in particular on bank and criminal sanctioning of activities aimed at making impossible to verify the users of the currencies. (Robby Houben, Alexander Snyers, (2018), Policy Department for Economic, Scientific and Quality of Life Policies, “Cryptocurrencies and blockchain, Legal context and implications for financial crime, money laundering and tax evasion”, Directorate-General for Internal Policies, Study Requested by the TAX3 Committee, European Parliament, PE 619.024-July).

[15] European Central Bank, “Virtual Currency Schemes”, October 2012, available at https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemes201210en.pdf; updated in 2015 European Central Bank, ‘Virtual currency schemes – a further analysis’, February 2015, available at https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemesen.pdf; Phoebus Athanassiou “Impact of digital innovation on the processing of electronic payments and contracting: an overview of legal risks”, European Central Bank, Legal Working Paper Series, No 16 / October 2017.

[16] The Commodity Futures Trading Commission (CFTC), the Securities and Exchange Commission (SEC), the Internal Revenue Service (IRS), the Department of Justice, the Treasury Department have all issued relevant guidance. See Sharon Brown-Hruska and Trevor Wagener (2018) “Recent Trends in Virtual Currency Regulation, Enforcement, and Litigation” NERA Economic Consulting 18 May 2018. The US approach is discussed in more details later in the article.

[17] Discussed in more details later in the article.

[18] The Commodity Futures Trading Commission (CFTC), the Securities and Exchange Commission (SEC), the Internal Revenue Service (IRS), the Department of Justice, the Treasury Department have all issued relevant guidance. See Sharon Brown-Hruska and Trevor Wagener (2018) “Recent Trends in Virtual Currency Regulation, Enforcement, and Litigation” NERA Economic Consulting 18 May 2018. The US approach is discussed in more details later in the article.

[19] See the North American Securities Administrators Association “NASAA Reminds Investors to Approach Cryptocurrencies, Initial Coin Offerings and Other Cryptocurrency-Related Investment Products with Caution”, January 4, 2018, Washington DC.

[20] House of Commons Treasury Committee, “Crypto-assets”, Twenty-Second Report of Session 2017–19, 12 September 2018, available at https://publications.parliament.uk/pa/cm201719/cmselect/cmtreasy/910/910.pdf

Despite the negative language used by regulators in public statements, several developing countries have already recognised several uses of cryptocurrencies. Developed countries including US, Switzerland and Japan, have also taken steps to bring these financial innovations under regulatory controls acknowledging potential benefits from their use and the use of the underlying technology, distributed ledger technology (DLT), which is characterised by many experts on the field and policymakers as transformative or even revolutionary. By way of example, in October 2018, the Japanese government granted the Japan Virtual Currency Exchange Association, an industry association, powers of regulation and enforcement on cryptocurrencies[21]. In Switzerland the government has taken formal steps to liberalise cryptocurrency banking access[22] and in 2018, its Stock Exchange launched the world's first exchange trading product tracking multiple cryptocurrencies[23]. For 2019 a number of regulated cryptocurrency banks are expected to start operations[24]. In US, the debate about the regulation of cryptocurrencies continues and focus primarily not on banning them but whether they should be regulated as securities, commodities or money[25].

Companies involved in cryptocurrency markets continue their efforts to reach mainstream. On February 2019, Reuters[26] reported the efforts of several cryptocurrency exchanges to acquire listed companies, raising funds and presenting themselves as embedded in the traditional financial services world. Cryptocurrency firms in Japan, in UK and elsewhere have set up self-regulatory bodies to develop industry standards[27] seeking to address accusations of anarchy in the crypto markets[28]. The impact of the announcement of Facebook's cryptocurrency will be significant adding positive momentum to the industry's efforts. Traditional banks also seek to join the new market, seeing opportunities, with JP Morgan being the first US bank to announce, in February 2019, the rolling out of the first US bank-backed cryptocurrency. There is also research being conducted and studies published in regards to the possibility of central banks issuing their own cryptocurrencies[29].

This article joins the debate on the regulation of cryptocurrencies taking the view that these currencies and the assets associated with them, in one or another form, will very likely last long term because their existence is supported by powerful and beneficial technology and offers advantages which satisfy markets and social demands. Cryptocurrencies could be beneficial consumers by serving underserved or excluded customers and by offering lower cost solutions thus filling a gap left by the high-cost, often difficult to access, centralised and heavily regulated conventional financial system. The article also argues that the creation of a new, alternative, financial ecosystem based on DLT and crypto-assets, which will be separate from the traditional one and running alongside it could offer an

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[21] Taiga Uranaka "Japan Grants Cryptocurrency Industry Self-regulatory Status", *Reuters*, 24 October.

[22] Ralph Atkins,(2018) "Switzerland Looks to Liberalise Cryptocurrency Banking Access", *Financial Times,* July 2.

[23] Chris Flood (2018), "Switzerland Gives Green Light to First Cryptocurrency ETP", *Financial Times*, November 17.

[24] Hannah Murphy and Philip Stafford (2018), "Former UBS Bankers to Set up Regulated Cryptobank", *Financial Times*, September 27.

[25] Discussed in more detail below.

[26] John Alun and Anna Irrera "Cryptocurrency companies use 'backdoor' listings to ease into mainstream", Reuters, February 22, 2019.

[27] See e.g Crypto UK in the United Kingdom.

[28] Gary Lilienthal and Nehaluddin Ahmad (2018) "Bitcoin: is it really coinage?", 24 *Computer and Telecommunications Law Review*, 49-56.

[29] See e.g. Committee on Payments and Market Infrastructures (2018) "Central bank digital currencies", *Bank for International Settlements*, March.

attractive structural remedy to the growing problem of systemic risk caused by the continuing expansion of the traditional financial ecosystem and the ever growing size of financial conglomerates, too-big-to-fail institutions. In this author's opinion, explained in the article, regulators' current approach to financial markets' monitoring and compliance cannot guarantee the prevention of future crises in the traditional financial system and therefore the need for a different solution to maintain long term stability may be needed. This solution could emerge from the creation of a second parallel financial ecosystem, operated mostly by non-banks (crypto, fintech big tech companies and other financial innovators), which would have increased operational autonomy and limited direct links to the traditional financial markets thus helping to limit market contagion and to stabilise the markets in periods of crisis in the main system helping also to prevent major economic disruption. The overall cost of regulating two smaller systems will be lower than the cost of regulating a single, very larger and complex one especially as the alternative market will have to be subject to lighter regulation. If we stick with the current market architecture, the ever growing size and interconnectedness of the financial system could become a ticking bomb in the foundations of the global economy, whereas the cost of regulation will spiral out of control with the chances of preventing futures crises more limited than many regulations think.

The article is structured as follows: section 2 discusses definitional issues about cryptocurrencies and DLT; section 3 evaluates the significance of the proliferation of virtual currencies and cryptocurrencies; section 4 discusses the current regulatory responses to the appearance of cryptocurrencies; section 5 discusses possible regulatory solutions including the possibility of allowing the creation of a parallel new market for financial products and services built around financial innovations such as cryptocurrencies and DLT; section 6 discusses the way forward and concludes the article.

2. Cryptocurrencies and DLT: definitional issues

Cryptocurrencies belong to the broader group of currencies known as "virtual currencies" (VCs) as they do not have physical existence and their circulation is only in electronic form through the internet. These features are not unique as electronic versions of traditional currencies (the so-called "electronic money") have been in use for some time and so have electronic payments, investments and other forms of financial transactions and assets.

However, VCs are distinguished from the traditional currencies, the so-called "fiat money", because unlike the latter, they are not issued by a central authority but primarily by private, often anonymous and decentralised, operators[30]. Traditional currencies are also available in physical (paper) form, which is not the case with VCs.

VCs originally appeared on the internet as mediums of exchange of online ("virtual") goods and services and as units of account usually in the context of virtual communities and games such as second life or online casinos[31]. The VC creators would offer these digital currencies for free to their members to be used for activities and purchases within the community, often gaming platforms, or users could purchase them using "real" money[32].

[30] ECB reports, *op.cit*.15.
[31] *Ibid*.
[32] *Ibid*.

Although their use was originally confined to online games and communities, VCs gradually expanded and became means for "real life" payments[33]. However, even if their numbers and uses increased over time, their impact on the economy remained marginal, until the appearance of a new generation of VCs the so-called "cryptocurrencies", which promise broader use similar to that of traditional currencies. There are currently thousands of different cryptocurrencies in circulation and their total market capitalisation[34] exceeded $600 billion during 2017. However, after hitting a $800 billion peak early in 2018 the price of bitcoin, which makes up the majority of the capitalisation, went into major correction driving down also the prices of other VCs. The crypto market, overall, remains small but the launch of Facebook's Libra in 2020 is expected to dramatically increase its size due to Facebook's 2.4bn users. Libra's technical features will also likely drive the efforts towards standardisation in crypto markets as the current situation with the myriad different currency models is unsustainable unsustainable.

There is currently no universal legal definition of virtual currencies. The Securities and Markets Stakeholder Group (SMSG), which advises the European Securities and Market Authority (ESMA), uses the taxonomy introduced by FINMA, Switzerland's supervisory authority[35], which classifies VCs into three groups based on their economic function: *payment tokens*, *utility tokens* and *asset tokens*[36].

Payment tokens are used as a means of payment for goods or services; *utility tokens* provide access to a specific application or service; and *asset tokens* represent assets, such as a debt or equity claim on the issuer[37].

Most cryptocurrencies currently in circulation, follow the technical features of bitcoin, the first and most widely used cryptocurrency. Bitcoin uses the so-called blockchain technology also known as distributed ledger technology (DLT), which first appeared in 2009. DLT refers to a set of tools for recording data, which allows a network of computers to verify and store updates in a secure and permanent way without the need to use a single central management system[38], such as that used by central banks.

As a virtual currency, bitcoin exists online and is stored in virtual "wallets". Bitcoin transactions take place through the transfer of bitcoins from one virtual wallet to another in ways similar to the transfer of email messages[39]. The transaction is also broadcast through the internet to the bitcoin network and goes through a validation process, called "mining", for

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[33] For more details see ECB *op.cit.15*; also Beate Sauer (2016), "Virtual Currencies, the Money Market, and Monetary Policy", 22 *Int.Adv.Econ.Res.,* 117–130.

[34]Source: https://coinmarketcap.com/

[35] See FINMA "Guidelines for enquiries regarding the regulatory framework for initial coin offerings (ICOs)", 16 February 2018; FINMA Guidance 04/2017, "Regulatory treatment of initial coin offerings", 29 September 2017. For more details about Switzerland's approach to cryptocurrencies see Thomas G. Albert (2018), "Crypto nation Switzerland - a legal and regulatory overview on recent developments", 33 *J.I.B.L.R.*, 326-330.

[36] Securities and Markets Stakeholder Group "Own Initiative Report on Initial Coin Offerings and Crypto-Assets", Advice to ESMA, ESMA22-106-1338, 19 October 2018.

[37] *Ibid*.

[38] See European Central Bank and Bank of Japan, (2017) "Payment systems: Liquidity Saving Mechanisms in a Distributed Ledger Environment", September, available at https://www.ecb.europa.eu/pub/pdf/other/ecb.stella_project_report_september_2017.pdf

[39] https://bitcoin.org

which powerful computers offered by volunteers are used[40]. The process includes complex mathematical calculations, which are used to confirm the transaction. Miners may earn a fee for the confirmation, but the mining process may also be used for the generation of new bitcoins[41].

For transactions, the confirmation process culminates with their addition into a block[42] which is protected by cryptography (this is where "crypto" comes from) and which is verified by the computer network. The block is then added to a block chain, which includes bitcoin transactions in chronological order and is shared by all bitcoin users. The blockchain functions as a ledger, a similar function to the one used by banks to record transactions.

The cryptography used is aimed to ensure that blockchains cannot be modified by hackers, who could seek to invalidate the transactions[43]. A transaction is usually confirmed multiple times by different miners. The fact that each transaction is shared with others does not mean that the names of individuals involved in the transactions are also shared. The owners of bit-wallets can remain anonymous if they wish so.

The whole process ensures the permanence of the transactions and transparency, which would help to avoid double spending. In addition, this method ensures the recognition and protection of property rights linked to crypto-assets, as these rights are recorded in a single distributed ledger, which is updated overtime a crypto-asset is sold or transferred. And all the process can be done peer-to-peer without the use of trusted third-party intermediaries who increase the costs and sometimes complicate the matters[44].

The bitcoin generation process is designed in a way that limits the number of new bitcoins being created. The bitcoin generation is slow and there is a projection of a finite number of bitcoins which will be created. This stands at 21 million coins[45]. The finite number of bitcoins is claimed to be for the purpose of avoiding currency inflation or its manipulation. These claims though are disputed by critics pointing to the existence of three types of bitcoin bitcoin cash, litecoin, and bitcoin gold and the fast generation of new bitcoins[46]. The protocol followed for the creation of bitcoin is not followed by all other cryptocurrencies. Ethereum, the second cryptocurrency based on market value, which was launched in 2015, relies on "smart" contracts[47], which are stored in blockchain nodes[48]. Also, Ethereum, is even more decentralised than bitcoin, offers lower transaction costs and it

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[40] *Ibid*.

[41] *Ibid*.

[42] Committee on Payments and Market Infrastructures "Distributed Ledger Technology in Payment, Clearing and Settlement: An Analytical Framework", February 2017.

[43] *Op.cit.15*.

[44] See also International Securities Services Association (ISSA) , "Infrastructure for Crypto-Assets: A Review by Infrastructure Providers", October 2018, available at https://www.euroclear.com/content/dam/euroclear/news%20&%20insights/Format/PDFs/2018/2018-10_ISSA_report_Infrastructure_for_Crypto-Assets-LR.pdf, p.9.

[45] ECB *op.cit.*15.

[46] Gary Lilienthal and Nehaluddin Ahmad, *op.cit.*28.

[47] Smart contracts are self executing (see ethereum.org)

[48] Marek Dabrowski and Lukasz Janikowski, (2018) "Virtual currencies and central banks' monetary policy: challenges ahead", Policy Department for Economic, Scientific and Quality of Life Policies, Directorate-General for Internal Policies, In_Depth Analysis for the European Parliament, PE 619.009 - June, p.12-13.

does not face the limitations in the generation of new cons that bitcoin has[49]. Ripple the third cryptocurrency based on market value, uses a private blockchain to which only specific users, banks and financial institutions, have access and control[50]. As bitcoin and many other cryptocurrencies are not backed-up by assets they do not have intrinsic value and this results in significant market volatility. A new type of coins, stablecoins seek to address this issue by linking the currencies to real assets helping to make them more stable something essential to make cryptocurrencies more attractive especially for payments.Facebook's proposed cryptocurrency is backed by real currencies and assets[51].

Compared to other virtual currencies, cryptocurrencies share certain common features such as that they are both decentralised and not issued by banks or other public authority. Also, both types of currency do not rely on the banking system to perform transactions or store the currencies, which allows their user to avoid the fees that banks charge for transactions e.g. for the use of credit or debit cards[52]. The credibility and reliability of both types of currency relies on the honesty and trust enjoyed by the issuing private authority (e.g. in the case of gaming VCs) or of its users (in the case of cryptocurrencies). Users act as both benefactors and protectors of the currency. Finally, the two groups of virtual currency are issued and controlled largely by technology, finance and internet companies, which do not fall within the definition of "banks".

However, there are also differences between them. Traditional VCs' use is normally limited to the virtual environment of their creation and they have no connection to the real world[53]. Cryptocurrencies are aimed to be used also for real world payments in the same way as real money.

Virtual currencies are distinct from electronic money or Internet-based payment schemes (e.g paypal), as the latter operate as facilitators of transactions denominated in *fiat* money[54].

A group of VCs, with increasing use are the digital tokens issued through the so-called "initial coin offerings" (ICOs), a process through which private businesses raise capital in exchange for digital tokens which may be used as payments for goods or services, or as securities, commodities, or derivatives[55].

3. Evaluating the significance of the proliferation of VCs and cryptocurrencies

Despite their relatively small market share, VCs and cryptocurrencies enjoy an increasing recognition as technological innovations, which together with their supporting technologies

[49] *Ibid*.
[50] *Ibid*. p.13; Scott D. Hughes, (2017) "Cryptocurrency Regulations and Enforcement in the U.S"., 45 *W. St. U. L. Rev.* 1-28.
[51] *Op.cit*.1
[52] see also Phoebus Athanassiou *op.cit*.15; C.Dierksmeier" and P.Seele (2018) "Cryptocurrencies and Business Ethics", 152 *J. Bus Ethics*,1–14.
[53] However, in some occasions users of VCs may be able to earn real money from those currencies. For example, Second Life online game allows the players to exchange Linden Dollars for real money (US Dollars, euros etc). Players cannot use linden dollars to for real world payments.
[54] Athanassiou *op.cit.*15.
[55] Financial Stability Board "Crypto-asset markets" Potential channels for future financial stability implications, 10 October 2018, available at http://www.fsb.org/wp-content/uploads/P101018.pdf

could have a transformative effect on the global economy by creating new types of business models, new products and services and new types of their delivery to consumers[56]. Some refer to cryptocurrencies and DLT as "disruptive innovators"[57], while others go as far as to talk about the beginning of a revolution[58]. Disruptive innovation allows small companies with limited resources to use innovative solutions to enter in new markets and successfully challenge larger incumbent players[59]. This is the case also in financial markets where the appearance of cryptocurrencies and DLT is challenging large financial institutions. Disruptive innovation is common feature in technology and internet markets and companies from these sectors have also presence in cryptocurrency markets.

For VC visionaries the broad VC use could remove the need for central banks or the need to use the conventional banking network and services for the economy to function. This in turn could have significant sociopolitical implications as the loss of currency controls by central banks, which are owned by national governments, could result in the erosion of state power to the benefit of the private sector and forces supporting the globalisation. The loss of intermediation by conventional banking could open the market to new significant systemic risks, which the current regulation will be unable to evaluate and address as it designed with bank intermediation in mind.

A part of the literature believes that there are too many risks and flaws in cryptocurrencies, which does not make them a viable solution[60]. More moderate voices predict that VCs will not be able to threaten the financial system or the central banks, but regulation will not be able to eliminate them either as their existence is due to market demand[61].

Others[62] note that central and conventional banks have already moved quickly to remove any disruptive potential of the blockchain technology by adopting it and exploiting it in a way that serves their interest.

Facebook Libra, due to the market size and resources of Facebok, once (and according to early sceptics "if") launched, could shake existing views in all sides of the debate. Also Libra does not concentrate the radical features of bitcoin (e.g. Libra is backed by real assets

[56] See Wulf A. Kaal and Erik P.M. Vermeulen (2017) "How to Regulate Disruptive Innovation- From Facts to Data", 57 *Jurimetrics* J., 169-209.
[57] See e.g. C.Dierksmeier" and P.Seele *op.cit*.52. For more detailed analysis of the disruptive role of products of financial technology see A. Fraile Carmona, A. Gonzalez-Quel Lombardo, R. Rivera Pastor, C. Tarin Quiros, J. P. Villar Garcia, D. Ramos Munoz, L. Castejon Martin, "Competition issues in the Area of Financial Technology (FinTech)", Policy Department for Economic, Scientific and Quality of Life Policies, Directorate-General for Internal Policies, PE 619.027 - July 2018.
[58] Bennett T. McCallum, (2015) "The Bitcoin Revolution", 35 *Cato J.,* 347-356.
[59] Ioannis Anagnostopoulos (2018), "Fintech and Regtech: Impact on regulators and banks", *Journal of Economics and Business 100, 7-25.*
[60]E.g. Kevin Dowd, Martin Hutchinson(2015), "Bitcoin Will Bite the Dust", 35 *Cato J.* 357; Peter Seele, (2018) "Let Us Not Forget: Crypto Means Secret. Cryptocurrencies as Enabler of Unethical and Illegal Business and the Question of Regulation", 3 *Humanist Manag. J*.,133–139, at.135.
[61] E.g. Marek Dabrowski, Lukasz Janikowski*, op.cit.*48 p.26.
[62] *Ibid*.; R. Herian (2018) "Taking Blockchain Seriously", 29, *Law Critique,* 163–171, p.164.

and user anonymity is less likely to be an issue) and is supported by powerful establishment companies such as Mastercard[63], which will likely make it more receptive to regulators and the financial establishment potentially disappointing hardcore crypto supporters who see in cryptocurrency an opportunity to challenge the status quo. On the other hand, Facebook's massive market size and resources, could by themselves pose a threat to the system and a source of a global-size systemic risk to market stability.

This article argues that regardless of the fate of Libra, bitcoin and other current cryptocurrencies, in the long term privately-owned digital currencies and other technological innovations regulated by decentralised systems and processes could become mainstream if some of the fundamental flaws in the current financial system were not addressed, especially the cost and access issues.

Bank transaction fees remain unacceptably high and the cost of loans and capital from the banking system are prohibitive for many small businesses and consumers[64]. Significant contributors to the high cost of banking is regulation. Annual compliance costs for the financial industry stand according to some market estimates, at a staggering $270 billion[65]. This is approximately 4 percent of their annual revenue and 10 percent of their operating costs, with projections of the revenue figure rising to 10 percent by 2022[66].

In some banks the number of staff working in compliance departments matches that of front-office staff[67]. An additional estimated $320 billion has been spent since 2008 on enforcement actions fines and settlements[68] linked to breach of regulations. The large-scale reforms of financial regulation in the aftermath of the financial crisis and the significant expansion of regulatory rules raise significant compliance costs for banks. New strict and complex consumer protection laws, regulatory restrictions in the name of financial stability and the banks' own policies have also let down significant numbers of people and businesses who cannot access loans, raise capital or make use of essential financial services[69].

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[63] *Op.cit.*1.
[64] See William Magnuson (2018) "Regulating Fintech", 71*Vanderbilt Law Review,*1167-1226; Charles W. Calomiris (2018) "Restoring the Rule of Law in Financial Regulation", 38 *Cato J.* 701-719.
[65] Stuart Brock (2018), "the Cost of Compliance", *International Banker*, November 7.
[66] Brock ibid; Lucy McNulty (2017), "Compliance costs to more than double by 2022", *Financial News,* April 27.
[67] Peter Farley (2017) "Spotlight on Compliance Costs as Banks Get Down to Business with AI", *International Banker,* July 4.
[68] Financial Stability Board (2018) "Strengthening Governance Frameworks to Mitigate Misconduct Risk: A Toolkit for Firms and Supervisors", April 20.
[69] Magnuson *op.cit*.64 at 1181.

Key reasons behind the success of bitcoin and of other tools such as crowdfunding and other forms of peer-to-peer lending[70] introduced by financial technology[71] is that the transaction fees and the costs of raising capital and maintaining accounts are much lower than the costs charged by traditional banks[72]. In addition, there are no or light regulatory controls.

An equally significant problem for conventional banking is that due to the interconnectedness between banks, they appear in the eyes of many customers as a joint corporation, a banking trust acting in a self-serving manner and in disregard of the needs of customers or of the broader economy[73]. The financial crisis with its high cost for the economy and the daily news filled with scandals and incidents of greed greedy and corruption involving bankers seriously hurt banks' standing in society[74]. Expansive consumer and investor protection laws and tighter financial regulation post-crisis have failed to shake out this perception mainly because regulators are often seen too close to the industry and critics point to high risk of regulatory capture[75]. Some may even see in the current negative reaction of regulators to cryptocurrencies and other fintech products an effort to protect incumbent players[76].Financial scandals, which continue to plague the sector[77] also serve as constant reminders to consumers that the crisis of the traditional banking system has not ended and that the culture of greed and corruption in the sector is still strong. A 2015 US survey found that on financial matters Americans trust technology firms more than banks[78]. The new generation of financial products is increasingly controlled by such firms rather than conventional banks.

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[70] Crowdfunding allows companies to use the internet and social media to raise capital directly from large number of relatively small individual investors thus avoiding the banking system and large institutional investors with significant bargaining power which formed the traditional sources of capital.See also Magnuson *op.cit.*64 at 1182.

[71] Financial technology is a broad term encompassing a range of technological innovations with a variety of purposes. The European Commission has defined FinTech' as "technology-enabled and technology-supported financial services", which "aims to introduce new technological solutions for speedier, securer and more efficient financial products" ("Report from the Commission to the European Parliament and the Council on the assessment of the risks of money laundering and terrorist financing affecting the internal market and relating to cross-border activities" Brussels, 26.6.2017 COM(2017) 340 final).

[72] The lower costs from fintech products offered online, though, are not guaranteed. There are research studies finding that in certain markets fintech companies charge consumers more than traditional banks. In these cases, ease of access and convenience are offered as possible explanations for consumer preference to online products. For a relevant discussion see Greg Buchak, Gregor Matvos, Tomasz Piskorski, Amit Seru Fintech, (2018) "Regulatory arbitrage, and the Rise of Shadow Banks", *Journal of Financial Economics* 130, 453–483.

[73] For a further discussion see Ilias Kapsis (2019) "Sticks or Carrots? How to make British Banks more Socially Responsible", *Business Law Review,* forthcoming.

[74] *Ibid.*

[75] Wulf and Vermeulen, *op.cit.*56.

[76] *Ibid.*

[77] The LIBOR scandal, banks' involvement in tax evasion schemes and mis-selling practices, violations of anti-money laundering laws, violations of regulation and cases of corruption are regularly reported by the press and social media.

[78] Cited in Dougas W. Arner, Janos Barberis and Ross P. Buckley (2016) "150 years of Fintech: An evolutionary analysis",*The Finsia Journal of Applied Finance, 22-29.*

In developing countries regulated banking faces also serious trust issues and is even less accessible than that of the developed world and this has resulted in the significant presence of unregulated (or shadow) banking and technology firms which seek to fill the vacuum using the advantages from the broader use of smartphones. In Asia and Africa there are still 1.2 billion people with no bank account[79] who could benefit from technological solutions. In China, the market size of unregulated banking is estimated to $10 trillion[80]. The Chinese government allows the wider presence of finance or internet companies such as Alibaba, which can fill in the large lending vacuum left by banks. Although China has banned cryptocurrencies, their appearance and continuing success in other Asian markets and internationally could lead to a policy review in the future.

Further, central banks, as exclusive currency issuers and controllers of the monetary policy have also their own flawed record. Many critics have argued that past central bank money-supply interventions resulted in market distortions which have fuelled financial and economic crises and inflation[81]. Most prominent example the period of ultra-low interest rates in US by the Fed which is deemed to have fuelled the real estate bubble which led to the last financial crisis[82]. It is therefore unsurprising that the underlying philosophy of cryptocurrencies emphasises freedom from central bank control. It has been suggested that central banks could issue their own digital currencies[83]. However, such an option does not address the problem of central banks' monopolistic currency controls and of flaws in monetary policy. Instead, it will increase central banks' involvement in the economy, which will expose them to new criticism. Such a potential also runs against their traditional role[84].

4. Current regulatory approaches

Central banks and regulators have identified a number of risks linked to VCs. They include between others the increased anonymity of issuers and users, which could be money launderers and terrorists; the significant price volatility of VCs, which could bring significant losses to investors; the higher risk of fraud, due to anonymity and lack of public oversight in the transactions which are also irreversible; the complex and opaque technology used to produce and circulate them, which carries higher risk of hacking; and the absence of regulation, which would guarantee consumer and investor rights[85]. VCs also do not require financial intermediation (e.g. use of banks) for transactions, which according to critics

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[79] *Ibid.*

[80] See Bloomberg News "A Guide to China's $10 Trillion Shadow-Banking Maze", 7 June 2018, https://www.bloomberg.com/news/articles/2018-06-07/a-guide-to-china-s-10-trillion-shadow-banking-maze-quicktake

[81] See in particular the critique of libertarian economists who support cryptocurrencies based on economic theories developed by the Austrian School of Economics with F.A. Hayek being a prominent theorist (F.A. Hayek(1976). *Denationalisation of money: an analysis of the theory and practice of concurrent currencies*. London: Institute of Economic Affairs).

[82] Franklin Allen, Elena Carletti (2013) "New theories to underpin financial reform", 9 *Journal of Financial Stability,* 242–249.

[83] See Dong He (2018) "Monetary Policy in the Digital Age" *Finance & Development,* 55(2), 13-16.

[84] For an in-depth discussion of the issue of digital currencies by central banks see Committee on Payments and Market Infrastructures and Markets Committee (2018) "Central bank digital Currencies", Bank of International Settlements, March.

[85] Jackson, O. (2018) "US or Swiss approach for EU crypto regulation? *International Financial Law Review,* Feb 22, London.

poses additional risks. The European Banking Authority identified more than 70 risks[86] associated with VCs.
Whilst, there seem to be an international consensus about the risks from the use of cryptocurrencies, there is no consensus about how to deal with them. One key reason is that the innovative technology, which underpins cryptocurrencies offers significant advantages, which could be used to benefit the broader economy and no country wishes to ignore those benefits. In addition, there is growing competition between states for superiority in the broader area of fintech where blockchain and cryptos belong. Consequently, most countries[87] opt for placing cryptocurrencies under varying degrees of regulatory controls, while adopting policy frameworks that accommodate blockchain and other innovative aspects.

Two countries with advanced engagement with crypto-assets are United States and Switzerland. EU is still working out its approach to the matter leaving the main responsibility to the Member States.

In the US there is no law passed by Congress regulating virtual cryptocurrencies so the relevant oversight is left to various federal and state agencies. The Commodity Futures Trading Commission (CFTC), the Securities and Exchange Commission (SEC), the Internal Revenue Service (IRS), the Department of Justice, the Treasury Department have all issued relevant guidance.

CFTC has since 2005 ruled[88] that bitcoin and other digital currencies are commodities within the meaning of Commodity Exchange Act, and therefore subject to relevant regulations. US federal courts have since confirmed the above CFTC decision[89]. However, and despite this general pronouncement, CFTC does not yet clarified its position about all individual cryptocurrencies. By way of example, on December 2018, CFTC launched a public consultation on Ether, the second most important cryptocurrency after bitcoin and its use on the Ethereum Network. CFTC has not yet taken position on the status of Ether.

SEC in a 2017 investigation of the DAO, an unincorporated organization linked to Initial Coin Offerings (ICO) found that the offer and sales of tokens by the DAO were securities[90].

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[86] *Op.cit*.12.
[87] For a recent review of global trends in regards to regulation and enforcement for cryptocurrencies see Securities and Markets Stakeholder Group "Own Initiative Report on Initial Coin Offerings and Crypto-Assets", Advice to ESMA, 19 October 2018, ESMA22-106-1338.
[88] See Order Instituting Proceedings Pursuant to Sections 6(c) and 6(d) of the Commodity Exchange Act, Making Findings and Imposing Remedial Sanctions, against Coinflip, Inc., d/b/a Derivabit, and Francisco Riordan, CFTC Docket No. 15-29, 17 September, 2015.
[89] See United States District Court, District of Massachusetts, Case 18-cv-10077-RWZ, *Commodity Futures Trading Commission v. My Big Coin Pay Inc et al.* Memorandum of Decision, September 26, 2018; United States District Court, Eastern District of New York, Case No. 18-CV-0361, *Commodity Futures Trading Commission v. Patrick K. McDonnell and Cabbagetech, Corp. d/b/a Coin Drop Markets* , Final Judgment and Order, August 23, 2018; for a discussion see Mitchell Prentis (2015) "Digital Metal: Regulating Bitcoin As A Commodity", 66 *Case W. Res. L. Rev*. 609-638, P.626.
[90] See Securities and Exchange Commission (2017) "Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO", Release No. 81207 / July 25, 2017.

The relevant report also stated that all securities offered and sold in US had to be registered and registration also applied to entities or persons engaging in the activities of an exchange. The report stressed that automation offered by the new technologies "does not remove conduct from the purview of the U.S. federal securities laws". On December 1st, 2017, SEC filed[91] its first charges linked to distributive ledger technologies, against Flexcorps and two individuals for fraud and violation of registration rules. However, on separate occasions SEC has decided that bitcoin and ether are not securities[92]. SEC, though, has stressed thats its analysis of whether a token is a security is not static and could change based on market developments[93].

The IRS has issued tax guidance since 2014[94], according to which, VCs are treated as properties for tax purposes. In 2016 the Service requested through the Department of Justice[95] from Coinbase, a VC exchange platform information about persons involved in transactions on VCs through the platform during the period 2013-15, following tax evasion suspicions.

The US efforts especially since 2017 show an intention to monitor more closely the growing market of cryptocurrencies potentially paving the way for a more comprehensive regulatory approach.

Switzerland is taking a more favourable approach to cryptocurrencies. The country plans steps to liberalise cryptocurrency banking access wishing to gain an advantage over its competitors. Switzerland is home to Crypto Valley where a number of blockchain companies are based. FINMA, the country's regulator classifies VCs, into three groups based on their economic function: *payment tokens*, *utility tokens* and *asset tokens*[96]. Based on the classification, payment tokens, which is one of the key functions of bitcoin and other cryptocurrencies, are not regulated as securities[97]. VCs which are classed as utility tokens are generally not treated as securities.

Utility tokens whose purpose is to "confer digital access rights to an application or service and if the utility token can actually be used in this way", will not be treated as securities if there is no additional investment purpose involved[98]. Asset tokens are treated as securities[99]. VCs are not deemed deposits and are not subject to licensing requirements unless

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[91] United States District Court, Eastern District of New York, *Securities and Exchange Commission v., Plexcorps, Dominic Lacroix and Sabrina Paradis-Royer,* Complaint, Case No. 17-CV-7007, December 1, 2017.

[92] See William Hinman, Director, Securities and Exchange Commission, Division of Corporation Finance, "Digital Asset Transactions: When Howey Met Gary (Plastic)" Speech, San Francisco, California, June 14, 2018, available at https://www.sec.gov/news/speech/speech-hinman-061418

[93] Hinman, *ibid*.

[94] See Notice 2014-21.

[95] California Northern District Court, Case No. 16-cv-06658-JSC

[96] "Guidelines for enquiries regarding the regulatory framework for initial coin offerings (ICOs)", 16 February 2018, para.3.1.

[97] *Ibid*. para. 3.2.1.

[98] *Ibid*. 3.2.2.

[99] *Ibid*. 3.2.3.

there are liabilities with debt capital character (e.g. promises to return capital with a guaranteed return)[100]. Payment tokens are subject to Anti-Money Laundering controls but not the utility tokens[101].

But even where regulatory controls are imposed the Swiss Authorities have taken steps to ensure that the regulation is not unduly restrictive. For example, Swiss laws allow Client authentication online[102]. For payments, if the transaction is below certain specified limits, there is no formal requirement for client identification[103]. Also, Swiss law has been revised to ensure neutrality against technologies and business models, new licensing category for innovators, and licensing exemptions (sandbox)[104].

For tax purposes Switzerland categorises cryptocurrencies as foreign exchange.

The overall Swiss approach to regulation is for principles-based and not rules-based regulation, which offers flexibility allowing to accommodate new technologies, while helping to close any gaps in legislation[105].

The EU approach to cryptocurrencies should be evaluated at two different levels:

The first level concerns the efforts of EU to eliminate the harmful effects of these currencies especially those caused by anonymity, by subjecting them to existing regulatory mechanisms. To that effect the 5th Anti-money Laundering Directive[106], which amends the 4th Antimoney-Laundering Directive provides a legally binding definition of virtual currencies and subjects them to the scope of Anti-money laundering EU laws.

In particular, Article 2(d) defines virtual currencies as:

"…*a digital representation of value that is not issued or guaranteed by a central bank or a public authority, is not necessarily attached to a legally established currency and does not possess a legal status of currency or money,but is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically*". The Directive also provides a definition of "custodian wallet provider", which means "an entity that provides services to safeguard private cryptographic keys on behalf of its customers, to hold, store and transfer virtual currencies".

The 5th directive also clarifies that virtual currencies are distinct from electronic money, from "funds", monetary value stored on instruments, or in-game currencies used wanting specific games[107]. The Directive clarifies that VCs can be used as a means of payment but

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[100] *Ibid*.3.4.

[101] *Ibid*.3.6.

[102] Mark Branson, Finma CEO, (2015) "Technological change and innovation in the financial sector", Speech to the Zurich Business Club, Zunfthaus Saffran, Zurich, September 10.

[103] *Ibid.*

[104]FINMA (2016) "FINMA, reduces obstacles to FinTech", Press Release, March 17.

[105] *Ibid*.

[106]Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 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 Directives 2009/138/EC and 2013/36/EU, OJ L 156, 19.6.2018, 43–74.

[107] For more details about the definition of each term see Athanassiou *op.cit*.15.

also for other purposes. The Directive seeks to cover all the potential uses of virtual currencies.

The purpose of the 5th AML Directive was to subject virtual currencies exchange platforms and wallet providers to legal binding obligations with the purpose of reducing anonymity in transactions[108]. The possibility for electronic money products to be exempted from AML/CFT requirements was to be further restricted[109].

The 5th Directive confirmed[110] those objectives: providers of exchange services between virtual currencies and fiat currencies, and custodian wallet providers, must be registered, currency exchange and cheque cashing offices, and trust or company service providers must be licensed or registered, and providers of gambling services must be regulated. Member States are tasked to ensure that the above goals are met. The directive also acknowledges[111] that the registration of exchange providers and wallet custodians will not fully resolve the anonymity issue. Therefore, the Directive provides that to combat the risks related to the anonymity, national Financial Intelligence Units (FIUs) should be able to "…obtain information allowing them to associate virtual currency addresses to the identity of the owner of virtual currency". In addition, users could be offered the opportunity to self-declare to designated authorities on a voluntary basis.

Members states are asked to submit "… appropriate legislative proposals, including, where appropriate, with respect to virtual currencies, empowerments to set-up and maintain a central database registering users' identities and wallet addresses accessible to FIUs, as well as self-declaration forms for the use of virtual currency users".

Critics of the Directive already point out several "blind spots" in the Directive: these include "miners, pure cryptocurrency exchanges that are not also custodian wallet providers, hardware and software wallet providers, trading platforms and coin offerors"[112].

The second level concerns efforts to embrace beneficial aspects cryptocurrencies as parts of the Commission's drive to support digitisation and fintech. In this context, the Directive calls for "…a balanced and proportional approach, safeguarding technical advances and the high degree of transparency attained in the field of alternative finance and social entrepreneurship"[113].

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[108] "Report from the Commission to the European Parliament and the Council on the assessment of the risks of money laundering and terrorist financing affecting the internal market and relating to cross-border activities" Brussels, 26.6.2017 COM(2017) 340 final, p.12.
[109] *Ibid*.
[110] Art 44(29).
[111] Preamble para.9.
[112] Houben and Snyers *op.cit.*14.
[113] Preamble para.8.

The Commission's Action Plan on FinTech[114], which was published on 8 March, 2018, also highlights the EU decision to create a more "future-oriented regulatory framework" which embraces digitisation and creates an environment where "… innovative FinTech products and solutions can be rapidly rolled out across the EU to benefit from the economies of scale of the single market without compromising financial stability or consumer and investor protection"[115].

5. How should regulation respond?

5.1.Identifying the challenge:

DLT has the potential to change the philosophy and content of regulation in a radical way as the principles of decentralization, anonymity and disintermediation on which DLT is based challenge the core philosophy of regulation.

An indicative example can be the market of securities. In this market currently the key functions – issuance, trade, clearing, settlement, registration, safekeeping and servicing of securities– are performed by a complex nexus of centralized intermediaries, which includes, banks, stock exchanges, Central Counterparty Clearing Houses (CCPs), Central Securities Depositories (CDSs) and many others[116]. Each function is heavily regulated and overseen by regulators. The relevant processes, which are distinct, are designed in such a way that maintains the stability and integrity of the entire securities market, while helping to mitigate systemic risks.

DLT by allowing the issuance, trade, clearance, settlement and safekeeping of securities on a blockchain has the potential of rendering all the current processes in these areas redundant and with them large parts of existing regulatory rules, which cover them[117]. The European Banking Authority, in its 2014 Opinion[118], admitted that addressing the various risks posed by VC a "substantial body of regulation" would be required, some components of which are currently being untested. Most importantly a new regulatory philosophy and tools will be needed, which will be relying less on centralisation and static analysis which is traditionally favoured.

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[114] Communication from the Commission "FinTech Action plan: For a more competitive and innovative European financial sector" Brussels, 8.3.2018. COM(2018) 109 final.
[115] Introduction *ibid.*
[116] See also ISSA report *op.cit*.44.
[117] *Ibid.* For a more detailed discussion of the legal implications for the market of securities see Mark Kalderon, Ferdisha Snagg, Claire Harrop (2016) "Distributed ledgers: a future in financial services?", 31 *J.I.B.L.R.*, 243-248.
[118] *Op.cit*.12.

Nevertheless, the decentralisation of financial markets may end up not being a bad thing for regulators because DLT, by removing the need for intermediaries or centralised depositories can create, overall, a new, simpler financial ecosystem, which will be easier to monitor and regulate.

The full picture about regulation will take years to unfold but meanwhile some other more urgent regulatory challenges will have to be resolved: First, there is the definitional issue. Currently regulators around the globe have not come up with a widely acceptable definition of cryptocurrencies. Are they currencies? Commodities? Securities[119]?Payment systems? Depending on the definitions different sets of regulations could apply[120]. Second, the anonymity behind cryptocurrencies and the large number of different cryptocurrencies in circulation make it very hard to identify the subjects of the regulation and monitor their behaviour[121]. How should regulation regulate the more than 2000 different cryptocurrencies currently in circulation, many of which demonstrate unique features? Should regulation target the miners, the users of cryptocurrencies or the exchange platforms? Or all? And how can regulators identify them? Also, there is the additional problem, that cryptocurrencies work outside of the traditional financial system and thus they do not belong to the traditional subjects of financial regulation. The latter regulation will, therefore, have to expand to these non-bank entities which run the new products. Also, individuals working in cryptocurrency markets do not meet the definition of bankers or current registration and certification rules. New sets of regulatory rules and new types of regulatory institutions will have to be established. Third, jurisdictional issues[122] caused by the decentralised nature of blockchain technologies and the absence of recognisable intermediation could hinder the ability of regulators to resolve territoriality issues. Fourth, the type of regulation that should be chosen: public regulation operated by public bodies, private regulation (or self-regulation) operated by market participants or a mix of both? Fifth, the intensity of regulation: should it be light-touch or should it be more interventionist seeking full regulatory checks? Sixth, the goals of regulation: what should a future regulation seek to achieve? A total ban of cryptocurrencies? a partial or a complete legitimisation? Should crypto-assets be subject to the same criteria as traditional financial products or as separate markets.

The next section will not make recommendation on the first three challenges, which cover technical details, but will focus instead on the last three: the type, intensity and goals of any future legal framework on cryptocurrencies.

5.2. Considering the options

[119] Gary Lilienthal and Nehaluddin Ahmad (2018), *op.cit.*28 consider them securities rather than currencies.

[120] Anastasia Sotiropoulou and Dominique Gue´gan (2017) “Bitcoin and the challenges for financial regulation”, 12 *Capital Markets Law Journal*, 466-479; Dong He, Ross Leckow, Vikram Haksar, Tommaso Mancini- Griffoli, Nigel Jenkinson, Mikari Kashima, Tanai Khiaonarong, Céline Rochon, and Hervé Tourpe (2017) “Fintech and Financial Services: Initial Considerations”, IMF Staff Discussion Note 17/05, International Monetary Fund, Washington, DC.

[121] *Ibid*.

[122] For more details on potential conflicts of law issues see Mark Kalderon, Ferdisha Snagg Claire Harrop (2016) “Distributed ledgers: a future in financial services?” *Journal of International Banking Law and Regulation* 31(5), 243-248.

A key objective of regulation is the maintenance of financial stability which includes crisis prevention[123]. A first therefore issue to consider is if financial technology is crisis-prone. This will help to evaluate the level of risk of systemic crises originating from technology.

5.2.1 Is technological innovation crisis-prone?

Banner (1997[124]) who investigated the history of regulation in the market of securities in USA and Britain found that significant developments in information technology alone *did not* result in new securities regulation. The presence of innovative technology may amplify or accelerate the coming of a financial crisis but it, alone, cannot cause it. It will have to be in combination with other factors. It has been argued that financial crises are linked to the economic cycles[125] and that as such their regular appearance is therefore inevitable as much as predictable. If one accepts that proposition, they can accept also that crises will happen with or without technological innovation with or without strong regulation[126].

However, both regulators and significant part of the literature agree that the decentralised and anonymised nature of DLT and cryptocurrencies pose unique challenges as they make it harder for regulators to measure and monitor market risks using existing tools[127].

It could be argued therefore that technological innovation can become a source of crisis and systemic risk if regulators are unable to create appropriate mechanisms to oversee the operation of technology-driven innovations.

5.2.2 Benefits and costs of regulation

Correcting market failures, improving the functioning and stability of the financial system and protecting consumers have been key objectives of financial regulation, but past experience shows a mixed regulation record of success. In addition, the economic costs of building a robust regulatory regime are high and they keep increasing as financial markets constantly expand to new products and services (electronic banking, complex derivatives, cryptocurrencies, crowdfunding and other financial technology creations are such examples) and become more complex and regulation expands with them. Regulation also becomes more restrictive for banks as it expands. A situation of over-regulation could easily emerge as a result and can be as harmful as the period of under-regulation prior to the financial crisis. In conditions of over-regulation banks have sufficient incentives to seek strategies to avoid compliance with the rules as such an approach would relieve them of the regulatory burden[128].

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[123] J. Armour, D. Awrey, P. Davies, J. Gordon, C. Mayer and J. Payne, (2016) *Principles of Financial Regulation,* Oxford University Press, at p.3.
[124] Stuart Banner, (1997) "What Causes New Securities Regulation--300 Years of Evidence", *75 Wash. U.L.Q*., 849-855.
[125] Wulf A. Kaal, (2013) "Dynamic Regulation of the Financial Services Industry", 48 *Wake Forest L. Rev.,* 791-828.
[126] As Banner above argues too. See also Reinhart, C., Rogoff, K., (2009) *This Time is Different: Eight Centuries of Financial Folly*, Princeton University Press.
[127] On the matter see also Magnuson *op.cit*.64.
[128] Edward J. Kane (1988) "Interaction of Financial and Regulatory Innovation" 78*The American Economic Review,* 328-334.

There is also a trade-off between regulation and broader economic growth especially in conditions of over-regulation as excessive restrictions on the freedom of financial markets could result in limited availability of capital for companies and loans to consumers thus hurting economic growth[129].

There are also internal issues for regulation. Regulators' initial enthusiasm to stabilise the system in periods of crisis tend to fade away after stabilisation has been achieved. By the time of the next financial crisis regulators have lost their state of alertness and effective oversight of market developments[130]. Part of the reasons for the reduced effectiveness concerns competing national interests. In a fragmented global regulatory system national regulators tend to work more effectively together only during periods of crisis. As stability of the system is restored, diverging national interests which have prevented the creation of international regulatory bodies with substantial enforcement powers, resurface[131] reducing gradually the effectiveness of international cooperation[132].

The last financial crisis showed the extent of the problem. Existing international bodies such as the Basel Committee on Banking Supervision, the Financial Stability Board, the International Organisation of Securities Commissions and other international standard setters, which rely heavily on political consensus and soft-law guidelines to coordinate action at national level, were lacking tools for adequate response to the crisis. The Basel Committee in particular, faced serious criticism also about its lax capital requirement rules (product of serious risk miscalculation) prior to the crisis, which resulted in inadequate capital buffers in a number of systemic banks when crisis hit[133].

In Europe, the European Union with its common currency and advanced level of political and economic integration did not have a legal framework to deal with a systemic crisis and true banking union did not exist. Competing national interests undermined the integrity and

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[129] For more details on the relationship between over-regulation and economic growth see I. Kapsis (2019) "Sticks or carrots? How to make British Banks more socially responsible", 40 *Business Law Review,* 38-48.

[130] Lord Turner, who in 2009 led the review of the causes of the financial crisis in UK, argued that long periods between banking crises tend to breed complacency (Parliamentary Commission on Banking Standards, (2013) 'Changing Banking for good', Final Report, vol.I, p.15, available at http://www.parliament.uk/documents/banking-commission/Banking-final-report-volume-i.pdf).

[131] Usually the design of appropriate regulatory regimes at national level is closely associated with the economic goals national governments seek to achieve. For example unregulated or under-regulated economies are more likely to attract foreign investments than heavily regulated ones. The same holds of the financial markets. For more detailed discussion see John C. Jr. Coffee (2014), "Extraterritorial Financial Regulation: Why E.T. Can't Come Home", 99 *Cornell L. Rev.,*1259-1302.

[132] For a detailed discussion of international coordination problems between regulators see: Chris Brummer (2011) "How International Financial Law Works (And How It Doesn't)", 99 *Geo. L.J.,* 257-327.

[133] For a review and critique of the Basel II rules which preceded the financial crisis see Harnay and Laurence Scialom (2016)"The influence of the economic approaches to regulation on banking regulations: a short history of banking regulations", 40 *Cambridge Journal of Economics*, 401–426; also Heidi Mandanis Schooner (2015) "The Dogma of Capital Regulation as a Response to the Financial Crisis" in *The Changing Landscape of Global Financial Governance and the Role of Soft Law*, edited by Friedl Weiss, and Armin Kammel, BRILL, 2015.

stability of EU financial markets and also risked inflating the contagion effect when the crisis hit[134]. Overall, the financial crisis revealed a limited, dysfunctional and therefore ineffective international regulatory regime destined to fail when placed to a serious test.

The reforms which followed the crisis sought to address the identified institutional weaknesses and to improve the legal framework and international coordination with regulators claiming success in achieving these objectives[135]. However, the new mandates of international regulators do not give them broad power and some diversions started to appear again especially as the conservative administration in US rolled back some of the measures adopted in response to the crisis[136]. The case of cryptocurrencies can serve as another example: although international regulatory bodies have analysed the global significance of cryptocurrencies and issued guidance they have not yet created a comprehensive legal framework for their regulation. The latter was left to national authorities which so far have demonstrated a variety of approaches just as before the crisis[137]. Cryptocurrencies can pose an even bigger long-term challenge to regulatory cooperation because the decentralised technology of blockchain, the use of internet for storing the currencies and performing transactions, and the anonymity of issuers and users generate genuine jurisdictional issues, which could become the source of potential conflict between regulators[138].

5.2.3 Public regulation, self-regulation or a mix of both?

The history of financial regulation demonstrates a variety of regulatory models, which could be used. One way to classify those models is by looking at their origins: public regulation, places the lead on public institutions linked to the government. It is usually deemed as defending the interests of the broader society. Public regulation can take a market-wide, systemic approach adopting rules which seek to defend the entire market and economy from systemic risks by correcting existing or perceived market failures[139]. But this type of regulation is conservative in nature restricting the freedoms of banks potentially beyond the necessary level, expansive, costly and in many ways inefficient[140]. It is also static and slower to respond to market developments, whilst relying heavily on centralised registers and systems to exercise control. In addition, public regulations are typically national or regional in scope driven primarily by national interests or interests of its members (such as in the case of EU). As a result, public regulation faces serious challenges when seeking to

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[134] For the situation in Europe prior to the financial crisis see Kenneth W. Dam, (2010) "The Subprime Crisis and Financial Regulation: International and Comparative Perspectives", *Chi. J. Int'l L*. 10, 581-638.

[135] Mark Carney, Governor of the Bank of England and Chairman of the Financial Stability Board has claimed that as a result of the reforms the financial system is safer, simpler and fairer (Mark Carney "The high road to a responsible, open financial system", Speech at Thomson Reuters, Canary Wharf, 7 April.

[136] New York Times (2018) "*Congress Approves First Big Dodd-Frank Rollback",* May 22, available at https://www.nytimes.com/2018/05/22/business/congress-passes-dodd-frank-rollback-for-smaller-banks.html

[137] Stavros Gadinis (2008) "The Politics of Competition in International Financial Regulation", 49 *Harv. Int'l L.J.* 447-507.

[138] See also Mark Kalderon, Ferdisha Snagg and Claire Harrop (2016) "Distributed ledgers: a future in financial services? 31 *J.I.B.L.R.*, 243-248.

[139] See Harnay and Scialom *op.cit.*133.

[140] Ibid; also Steven P. Croley, and Steven P. P. Croley (2007) *Regulation and Public Interests : The Possibility of Good Regulatory Government*, Princeton University Press.

regulate global financial products or services of decentralised nature such as the crypto-currencies. It is unsurprising, therefore, that so far public regulators have adopted a variety of approaches towards cryptocurrencies: from outright ban to partial acceptance and accommodation.

Unless there is some international consensus on the treatment of cryptocurrencies and the relevant responsibility is passed to international regulators it is hard to see how public regulation can be effective especially given the problem of regulatory arbitrage[141].

The opposite to public regulation is private regulation or self-regulation, which is market-led, more limited in scope and leaves the main responsibility for enforcing the rules and ensuring compliance to the regulated institutions or private bodies linked to the industry. These bodies also usually act as rule-setters. Self-regulation has advantages, which include access to market expertise, efficient allocation of resources and availability of a larger resource pool[142]. However, the credibility and accountability of private regulators can be an issue as well as regulatory capture as private regulators are from the industry and the risk of turning from protectors of the public to protectors of the industry is high[143]. Self-regulation has been linked to the period of deregulation of finance, which was one of the key causes of the financial crisis[144].

The financial crisis resulted in the rolling back of private regulation and the resurgence of public controls as a way to better handle systemic crises and regulate individual banks[145].

The philosophy underpinning the cryptocurrencies which is linked to decentralised, user-controlled digital currencies challenge the resurgence of public controls which emerged from the crisis. In the absence of intermediaries and recognisable issuers of cryptocurrencies, cryptocurrency users rely on trust between their users to build their credibility and guard their future. Sometimes private bodies created by the industry can be used as regulators. In October 2018, the Japanese government granted the Japan Virtual Currency Exchange Association, an industry association, powers of regulation and enforcement on cryptocurrencies[146]. The justification given was that in a fast-moving industry like that of cryptocurrencies, experts would be able to make rules in a more timely fashion than bureaucrats[147]. The argument for the use of experts and of self-regulation can be traced in the period of deregulation and is consistent with the consensus in the industry about the existence of significant information asymmetry between regulators and those regulated

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[141] Regulatory arbitrage refers to process through which companies move operations across the borders from areas with strict regulatory regimes to others with lighter or no regulation. See, Arner, D. W., Barberis, J., & Buckley, R. P. (2017). “FinTech, RegTech, and the reconceptualization of financial regulation” 37 *Northwestern Journal of International Law & Business*, 371-413, p.403; He et al. op.ct.37, para.32.

[142] For a review of the literature on self-regulation see Simon Ashby ,Swee-Hoon Chuah & Robert Hoffmann (2004) “Industry Self-Regulation: A Game-Theoretic Typology of Strategic Voluntary Compliance”, 11 *International Journal of the Economics of Business*, 91-106; for a critique see Anthony Ogus (1995) “Rethinking Self-Regulation” 15 *Oxford Journal of Legal Studies*, 97-108.

[143] Robert Baldwin Martin Cave and Martin Lodge (2011) *Understanding Regulation : Theory, Strategy, and Practice*, Oxford University Press, USA - OSO, 2011.

[144] Ibid.

[145] See Harnay and Scialom *op.cit*.133.

[146] Uranaka *op,cit*.21.

[147] *Ibid.*

(the banks). Regulators face difficult and costly access to information, whilst banks, which are more resourceful and are staffed by market experts can access it more efficiently thus saving taxpayers' of the need to issue regulations and hire additional regulators[148].

However, the well-known problem of self-regulation is that it ends up serving the interests of the industry in ways that could hurt financial stability.

A more mixed approach will have to be chosen. Regulatory theory has proposed a number of different mixed models including forced self-regulation where regulators subcontract regulatory functions to the regulatees[149], meta-regulation models where the regulators maintain supervision or risk control functions which are delegated to the corporations[150].

Cryptocurrencies, which incorporate multiple innovations pose a unique challenge and as such a close cooperation between the private sector, which developed them and regulators will be needed. The model will have to be unique and due to the highly technical nature of cryptocurrencies, the use of technology (called "regtech") will have to play a crucial part in regulatory efforts.

5.2.4 Static or dynamic regulation?

It is common knowledge that the level of innovation, speed, and complexity of financial markets make it virtually impossible for regulators to effectively monitor and regulate these markets. So, regulators are in constant struggle to catch up with market developments. Technological innovations add to the regulators' struggle because their future is uncertain. Not all innovations succeed in the markets and not all of them reach systemic levels. Virtual currencies have been in existence since the appearance of the internet, but they haven't acquired systemic significance yet. In contrast, complex mortgage derivative products, and risk assessments models developed by technology for banks became quickly a source of systemic risk which led to the financial crisis. It is therefore difficult at this stage to predict if cryptocurrencies, the new generation of VCs, will have better luck than their predecessors.

Facing uncertainty about the market prospects and limited resources, regulators have no choice but to follow a "wait and see" approach[151], while monitoring market developments closely to gather as much information as possible, hoping that they will be able to identify and prevent signs of crisis early. In such an environment it is clear that the highly volatile and unpredictable nature of technological innovations cannot be captured by static, "one-size-fits-all" types of regulation so efforts to adopt more dynamic regulatory frameworks will have to be made[152].

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[148] For more detailed analysis and discussion of the issue see Harnay and Scialom *op.cit.*133 at pp.412-414; also, Edward Kane *op.cit*.128.

[149] See Baldwin et al. *op.cit.*129. J.H. Walsh, (2008) "Institution-Based Financial Regulation: A Third Paradigm", 49 *Harv. Int'l L.J.,* 381-412.

[150] Ibid.

[151] Also Anagnostopoulos *op.cit.*59.

[152] Christie Ford (2013) "Innovation-Framing Regulation", *Annals of the American Academy of Political and Social Science*, Vol. 649, 76-97.

One way to achieve this goal would be through principles-based regulation, which lacks detailed provisions, but is flexible enough to allow quick adaptation to changing market conditions. This type of regulation uses soft law to produce a smart, dynamic regulation capable of quickly adapting to the constantly changing market environments and intervening only when required in order to maintain a level playing field and prevent crises. It has been used in the past with mixed results[153] but this does not necessarily cancel its effectiveness. Comparing to rule-based more static, regulation the principles-based one has certain advantages especially when financial innovations are targeted.

The use of technology of data gathering and analysis is crucial for dynamic regulation to succeed especially in high-tech data-intensive industries such as that of cryptocurrencies. The good news here is that with the significant technological advancements with the development of artificial intelligence and broader data gathering capabilities during the past decade, dynamic regulation has improved chances.

One of the crucial features of dynamic regulation is the reliance on assumptions about market developments and risks. For technological innovations assuming the right balance between beneficial and harmful effects is essential. The assumptions are needed in part due to the absence of concrete evidence about the market impact of innovative products. For dynamic regulation to be successful these assumptions will have to be correct. Prior to the financial crisis regulators were assuming that the main sources of risk would be linked to individual banks so regulators' focus were set on them. There was also a strong national focus and systemic risks from cross-border activities of banks or the international interconnectedness of the financial system were not accurately assessed and potential risks were underestimated[154]. These wrong assumptions were based in part on the absence of adequate data gathering and international cooperation capabilities. Regulators also ignored early warnings[155]. Ultimately, technological innovations such as those involving complex mortgage derivatives produced risks unseen before and with which regulators were unfamiliar and therefore unable to identify and prevent from occurring[156]. Also, the harmful effects of the new products (e.g. excessive risk of systemic proportions generated from the securitisation of mortgages, for which computer models and other technologies were used) offset the positive ones (e.g securitisation turning long-term, and therefore unavailable short-term, credit into a short-term one, freeing up credit for new loans which offered immediate support to the economy) causing a major crisis.

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[153] The Financial Services Authority, the main UK regulator prior to the financial crisis made broader use of principles-based regulation. The results were not good as FSA was unable to spot early signs of the crisis or respond to it in a timely fashion. This failure though should not be attributed to the principles-base regulation alone. There were other broader issues such as lack of systemic focus, which impacted on FSA's failure (see also Eric J. Pan, (2012) "Understanding Financial Regulation", 2012 *Utah L. Rev.* 1897-1947).

[154] E.g. the capital requirements established by Basel II for banks failed to create capital buffers capable of withstanding a significant systemic crisis as that which occurred in 2007-8. For a relevant discussion see Allen and Carletti *op.cit*.82.

[155] *Ibid*.

[156] For a more detailed discussion see Robert Baldwin and Julia Black (2008) "Really Responsive Regulation", 71*The Modern Law Review*, 59-94.

The failure of public regulation was also matched by an equally failing private regulation which was dominated by short-term, individual interests of large banks, and failed to exercise its self-regulatory functions.

The financial crisis exemplified the difficulty facing even the more flexible dynamic regulation in complex market environments such as those of financial services.

5.3 The role of regtech

To achieve effective monitoring regulators need more advanced technology tools to monitor complex fintech creations, such as crypto assets. Such tools have become increasingly available through "regtech", which uses various technological innovations such as artificial intelligence to automate manual processes, cloud and DLT to aggregate, share and store data and near real-time capabilities to monitor markets[157]. Regtech has been characterised as representing: "*the next logical evolution of financial services regulation and should develop into a foundational base underpinning the entire financial services sector*"[158].

Regtech could greatly improve the interaction between banks and regulators to improve market monitoring and enhance regulatory compliance. In an ideal scenario regulators should be linked so closely with the regulatees that they will be able to monitor market developments in real time and respond to these fast[159]. For banks regtech would mean significant lowering of compliance costs[160].

However, the abilities of regtech should not be overestimated. This is because its opponent, fintech, generates new financial products with speed which regulators cannot match. The use of regulatory sandboxes, areas where the industry can test new financial solutions before their market adoption, so that regulators can familiarise themselves with these solutions and prepare timely regulatory responses has been proposed as a way to address the time and knowledge gap between markets and regulators[161].

Another major challenge, which would hinder the effectiveness of regtech solutions is a legal one: the absence of an international legal framework for the deployment of regtech.Regtech requires extensive data collection and sharing for which legal cover is needed[162]. Various data protection laws, domestic constitutions and other legal obstacles can pose a threat[163]. Most importantly the political disagreements between national regulators could add to the problem.

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[157] He *et al. op.cit.* 120, para.31; Anagnostopoulos *op.cit.59*, p.14.
[158] See Arner *et al., op.cit.*141.
[159] *Ibid*.
[160] *Ibid*.
[161] The Financial Conduct Authority (FCA) of UK has operated a regulatory sandbox since June 2016 and a report issued after the first year of its operation, FCA claimed success (See Financial Conduct Authority (2017) "Regulatory Sandbox Lessons Learned Report", October 2017, available at https://www.fca.org.uk/publication/research-and-data/regulatory-sandbox-lessons-learned-report.pdf In 2018 FCA proposed the creation of a Global Sandbox whose use would be shared but national regulators.
[162] Anagnostopoulos *op.cit*.59.
[163] Mark Fenwick et al discuss issues of data security and privacy around driverless cars

Overall, regtech can often solutions for monitoring markets in real time but a realistic mechanism for such monitoring will take a long time to be created.

5.4 The goals of regulation

One of the most foundational questions about any decision on the appropriate regulation of cryptocurrencies is about the ultimate goal of any regulation. What should regulators seek to achieve? Absolute ban of cryptocurrencies? partial acceptance? Full acceptance?

The current strategy of regulators includes the gradual incorporation into public controls of the beneficial aspects of cryptocurrencies, while dealing with certain risky areas, especially anonymity and absence of investor and consumer protections. Registration schemes, anti-money laundering, fraud screening and gradual incorporation into existing frameworks for securities, commodities and consumer protections are parts of the strategy. Tax laws also make provisions for the incorporation of crypto-assets into the tax system.

This article argues that DLT and cryptocurrencies offer an opportunity for regulation to diversify the risks from the operation of financial markets by creating two separate financial ecosystems: a traditional one remaining under the control of traditional banks, and a more innovative and flexible one where crypto, technology, internet and finance companies will be major players. The traditional ecosystem will be the main one serving the broader economy. It will be higher-cost and heavily regulated, where consumers will be paying a premium for better protection of their rights and interests. The innovative, alternative ecosystem, offering almost the same range of products and service and being more flexible and less regulated, will be available to those with no access to the main system, innovators, or those who will be willing to trade a certain part of regulatory protection in exchange for more affordable and innovative finance.

From regulators' perspective, such a structural separation will allow them to deal more effectively with the systemic risks posed by both the ever growing size of the current, monolithic traditional financial architecture and the new types of risk generated by financial innovators such as cryptocurrency creators. The separation will allow for better management of the risks and will prevent contagion between the two ecosystems. In an opposite scenario where traditional financial markets and alternative markets form part of a single ecosystem, the market situation will be far more complex and risk assessments and monitoring far more difficult especially given the uncertainties currently surrounding innovative products. The costs of regulation of a single ecosystem would also be significantly higher as well as the costs of crisis prevention and containment.

The operation of two parallel markets will also help to prevent major disruptions in periods of crisis for either market as the alternative market would continue to operate normally. Crypto-assets and blockchain have the features, technical capacity and product range to develop a separate and sustainable market where the presence of traditional banks or bank intermediation and networks will not be needed. Overall, a creation of a new two-tier financial ecosystem, consisting of two distinct components could offer additional options in

(Mark Fenwick; Wulf A. Kaal; Erik P. M. Vermeulen, (2017) “Regulation Tomorrow: What Happens When Technology Is Faster than the Law”, 6 *Am.U.Bus.L.Rev*., 561-594).

the efforts to stabilise financial markets and prevent crises, while allowing consumers to enjoy more innovative financial products and services.

A separate, lower-cost, more inclusive banking system will also be able to support these parts of the economy which currently feel excluded from the banking system due to access and cost issues. Some could argue that the accessibility problems can be resolved through reforms of the traditional financial system[164] but history has shown that parts of the population will still be excluded or find the costs of working with banks unaffordable.

The expansion of traditional finance in developing countries has been slow showing that traditional banking may not be willing or capable to reach out to these markets in sufficient scale. Technology companies could achieve that faster and more efficiently. Treating the parts of society, which seek solutions outside of the existing banking system, as illegals involved in shadow banking, money laundering and other illegal activities or exposing them unprotected to exploitation by criminals does not resolve a social problem which could become more serious in the future driven by increased inequalities and lower living standards in developed countries and the endemic inefficiencies and corruption in the traditional banking sector in many developing countries.

The creation therefore of an alternative banking system using decentralised technologies and private currencies could offer multiple benefits longer term and regulators should seriously consider to encourage its creation.

The new "crypto"-based system will have to be regulated and there is evidence available showing that the cryptocurrency market participants would welcome such regulation,[165] which will also help to address the volatility problem currently facing the crypto-assets valuations[166], but the regulation should be of lighter touch[167] than that of the official banking to keep costs low and to maintain the flexibility and adaptability of the alternative system[168]. Besides, regulators' fears for widespread fraud, money laundering and other illegal activities in the absence of regulation, have not been confirmed by the number of recorded incidents in cryptocurrency markets, which remain relatively low[169]. Regulators will have to take steps to reduce some potentially harmful cryptocurrency features, such as anonymity

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[164] The European Banking Authority in its 2014 Opinion *op.cit.*12 argued that in EU, problems like opening a basic account cheaply are not a problem as relevant EU legislation provides such an option.

[165] Auer and Claessens studied cryptocurrency market reaction to news about regulation intentions in regards to cryptocurrencies. They found that the markets gained strongly in response to news pointing to the establishment of specific legal frameworks for these currencies and ICOs (Raphael Auer and Stijn Claessens (2018) "Regulating cryptocurrencies: assessing market reactions", *BIS Quarterly Review*, September, 51-65.

[166] Obi Nwosu, Chief Executive Officer of Coinfloor a London-based cryptocurrency exchange, who was interviewed by the UK Parliamentary Committee, highlighted that the current absence of regulation prevents crypto-assets from reaching mature stage, which would allow significant liquidity to flow in and stabilise these markets (House of Commons, Treasury select Committee (2018), *Crypto-assets,* Twenty-Second Report of Session 2017–19, 12 September).

[167] Ibid.

[168] See also W.Arner *et al., op.cit.*141.

[169] For more details on the matter see Malcolm Campbell-Verduyn (2018) "Bitcoin, crypto-coins, and global anti-money laundering governance" , 69 *Crime Law Soc. Change* 283–305.

but seeking complete anonymity elimination may not be required. Setting a transaction value threshold below which anonymity can be allowed could help address this problem. Neither should regulators seek to impose a "middleman" to better monitor the market and increase accountability as suggested[170]. Regulators though could impose safety switches, controlled by private regulators (members of the industry), which could bring the alternative market into a halt or isolate crisis spots to prevent contagion.

Overall, the goal of regulation in the new ecosystem would be to establish certain minimum standards of consumer protection using specific thresholds and hard rules, while letting principle-based regulation to handle the rest. The lighter-regulation regime will have to be controlled by a public-private regulator scheme.

The lower overall level of protection of consumers would be balanced by increased inclusivity and the lower transaction costs. For efficiencies and other reasons the two parallel systems could share certain regulatory rules (e.g. same AML rules for transactions above certain level), but regulators should make sure that the two systems would be structurally separate and that the second will be, overall, less regulated.

Traditional banks have more recently demonstrated a clear intention to enter into the cryptocurrency markets. For example, as already mentioned, in February 2019 JP Morgan launched the first US-bank backed cryptocurrency for payments[171]. Some banks are also experimenting with incorporating DLT into traditional banking models although the absence of regulation makes these banks cautious to adopt blockchain at a significant scale[172]. It is reasonable to expect more such efforts in the future as DLT technical weaknesses are addressed and regulators create clear rules about its use. The incorporation of DLT into traditional banking could be welcome, if it would lead to lower costs and reduced complexity in the traditional bank business models[173]

Expansion of traditional banks to crypto-markets through steps like JP Morgan's could offer both positive and negative competitive effects. On the positive side, bank-created cryptocurrencies would help to increase the market size and generate new competition, while banks could use their networks and experience to help standardise crypto-market features, which would enhance market stability and address the market uncertainty fed by the current state of extreme fragmentation. Cryptocurrencies, also, need new competition with comprehensive competitors in order to both attract new customers and address current weaknesses in the technology and the crypto business models. The EU fintech competition study[174] found that despite the existence of thousands of cryptocurrencies, only two of them, Bitcoin and Ethereum, accounted for 88 percent of the market in 2017 suggesting

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[170] Houben and Snyers, *op.cit.*14.

[171] Hugh Son (2019) "JP Morgan is rolling out the first US bank-backed cryptocurrency to transform payments business", 14 February, https://www.cnbc.com/2019/02/13/jp-morgan-is-rolling-out-the-first-us-bank-backed-cryptocurrency-to-transform-payments--.html

[172] For a recent market update on the pace and challenges for the adoption of blockchain in retail banking see Matt Higginson, Atakan Hilal, and Erman Yugac (2019) "Blockchain and retail banking: Making the connection", June, available at https://www.mckinsey.com/industries/financial-services/our-insights/blockchain-and-retail-banking-making-the-connection

[173] Cost reduction is expected from the decline of intermediation snd other sources.

[174] Op.cit. at 57, p.66.

high market concentration. The study sees competition benefits from a potential entry of banks into the crypto markets and even suggests central-bank issued digital currencies as a potential solution to the competition problem.

On the negative side, market entry of large banks in a new market currently occupied by a large number of small players, would give entrants a significant competitive advantage even over bitcoin and Ethereum, which could gradually result in banks taking control of the new market for the purpose of limiting competition there[175]. In the latter scenario market abuses by the dominant players and other disturbing phenomena (scandals, corruption etc) similar to those noticed in traditional markets could appear also in the new markets.

For this reason if an alternative financial ecosystem were to be created, regulators should take steps to ensure that banks would not dominate the new market. This could be achieved though rigorous application of competition rules and regulatory interventions. Steps such as ring-fencing could also be adopted in order to prevent contagion between the main and alternative markets. Transfer of systemic risk from the more unstable alternative market to the main one or vice versa will be possible if traditional banks operate in both markets and this is why this article suggests that regulators should take measures to support structural separation.

Entry into the alternative market of big tech, such as that of Facebook with Libra, could potentially help counterbalance the market power of banks but the activities of big tech should be closely monitored as these companies possess the resources to exercise market dominance to hurt consumers if they win the competition with banks.

At currency level, the appearance of digital currencies with ability to seriously compete against central-bank issued ones, is currently a distant possibility, although, in the author's opinion, the ever growing global marketplace of the internet of things makes increasingly compelling the case for the adoption of digital currencies for exclusive internet function. Technology companies, not facing the national restrictions facing central banks are in better place to provide such currencies, but in order to get there they will have to overcome a number of challenges including technical, legal and those related to trust. They will have to prove that their privately-issued currencies, are reliable and safe, which consumers will be happy to use in a safe and secure way. Facebook with Libra will likely test these waters with the outcome being hard to predict at this point.

6. The way forward

It has been said that an ideal scenario, a "dream" for regulators, would be for them to be able to operate a global financial surveillance system, which would be able to detect and address systemic risks in real time "in much the same way as happens with global weather systems and global internet traffic"[176]. The financial crisis revealed how far from realising their dream regulators had been as prior to the crisis they had not even been paying attention to the bigger picture in financial markets and to systemic phenomena of international

[175] Such a risk has been identified and assessed in the EU study on competition issues in fintech industry op.cit.57 p.14.

[176] A.G. Haldane,(2011), "To navigate economic storms we need better forecasting", New Scientist, No. 2842, December. For a discussion and critic of this view see Arner *et al*., *op.cit.*141.

scale. In the aftermath of the crisis new bodies like the US Financial Stability Oversight Council[177] and the European Systemic Risk Board[178] in EU were created to fill in this big vacuum. These bodies assisted by organisations entrusted with delivering "high-quality financial data, standards and analysis" such as the Office of Financial Research in the US[179] hope to be able to generate early warnings and more effective crisis prevention and response. Regtech solutions could also help by feeding the analysis with more and better quality market data.

However, and despite these improvements, the realisation of regulators' dream, still faces many technical challenges whereas the economic costs of establishing and operating a global surveillance system could be massive. Conflicts around jurisdiction will be very hard to resolve. Competing national interests and fragmented legal frameworks will ensure that the effectiveness of key surveillance components (e.g. data collection and sharing for cross-border activities) will be seriously undermined. But even if regulators' dream were to come true it is not sure that it would be crisis-proof. No surveillance system is perfect and the risk of failure will always be there. The history of regulation is not on regulators's side on issues of crisis prevention either. Reliance of the global economy on a single, massive, extremely complex, interconnected financial ecosystem is a very risky and potentially dangerous game which augments systemic risks and the costs from future financial crises.

DLT and cryptocurrencies in the eyes of regulators currently appear to be a new sign of trouble because they are innovations based on an entirely new technical philosophy, which regulators do not yet fully understand. But longer term they could offer solutions to serious problems facing the financial system including financial stability and inclusion.

The 2018 EU study on fintech competition acknowledged that cryptocurrencies can play the role of alternatives: "…in extreme cases, such as during periods of hyperinflation, financial crisis, political turmoil, or war, they can become a means of currency substitution in individual economies"[180]. The question is, if they can play that role in extreme cases, why not in normal cases as well? The answer from the above study may be that in normal conditions traditional currencies and banks have advantages which competition from cryptos cannot defeat[181]. However, this latter claim could be challenged by reality given that it is the market which demanded the creation and supports the operation of cryptocurrencies in normal conditions and it is regulators with their continuing opposition which have so far prevented the more significant growth of the cryptocurrency ecosystem. This shows that

[177] Body created under the Dodd-Frank Act in 2010 for the purpose of "…comprehensive monitoring of the stability of [the] nation's financial system" (https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/fsoc)

[178] The ESRB is responsible for the "macroprudential oversight of the EU financial system and the prevention and mitigation of systemic risk" (https://www.esrb.europa.eu/about/background/html/index.en.html)

[179] The mission of OFR is to "promote financial stability by delivering high-quality financial data, standards and analysis for the Financial Stability Oversight Council and public", (https://www.financialresearch.gov/).

[180] *Op.cit.*57.

[181] *Ibid*.

there may be more advantages to their use than regulators dare to admit and that regulators' opposition to cryptos may be also driven, at least in part, by political or other non-market considerations.