

The Financial Safety Net: Financial Stability and Depositor Protection in The Era of FinTech and Cryptocurrency

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ABSTRACT

This paper seeks to review the suitability of the current financial safety net for ensuring financial stability and depositor protection in the era of FinTech and cryptocurrencies. Following the Global Financial Crisis, the traditional financial system has situated the bank as the intermediary within the financial safety net to prevent contagion. This paper contends that the introduction of FinTech, particularly cryptocurrency, has altered the traditional banking model and as a result undermined the primary aims of the financial safety net regarding safeguarding depositor interest and promoting financial stability. The examination will be limited to Bitcoin. The paper will briefly discuss the advantages and key challenges of the platform that have hindered the development of a regulatory regime for the cryptocurrency market in relation to depositor protection. It will critically review the different approaches taken globally to cryptocurrency regulation. The approaches of the USA, EU and UK will be primarily examined. The paper does not seek to provide an answer to all the challenges identified rather, it will seek to address some of the gaps identified in the financial safety net's application to cryptocurrency providers and explore the possible regulatory solutions for the construction of a virtual financial safety net.

I. INTRODUCTION

In recent times, it has been argued that the financial sector is amid a transformative revolution spurred by digital innovation.¹ The merging of information technology with approaches to distributing and facilitating financial operations has been termed "FinTech".² Coined in the 1970's, the term FinTech is an amalgamation of the words finance and technology and can encompass a range of technologies both established and potentially disruptive spanning from email to blockchain.³ However, The Bank of England ('BOE') notes the term FinTech is mainly associated with cutting-edge financial technology "*that could result in new business models, applications, processes, or products with an associated material effect on financial markets, institutions and the provision of financial services*".⁴

Although the use of technology in the financial sector is not a novel concept, in the last decade, the pace of innovation within the financial system has grown exponentially.⁵ The rollout of cloud computing, robo-advisors, mobile applications and virtual currencies such as Bitcoin have transformed the way markets are structured, capital is raised and altered the way investors and customers engage with financial services.⁶ Regulators and

¹ Sam Robinson and Yasmin Kaur Yohal, 'FinTech rewards and risks: Evolution or revolution?' (2018) 7 (4) Compliance & Risk 6.

² Dharmendra Yadav & Stella Cramer, 'Fintech Developments' in Dora Neo, Hans Tjio and Lan Luh Luh, *Financial Services Law and Regulation*, (Singapore Academy of Law Publishing 2019) 644.

³ *ibid*

⁴ Bank of England, *Embracing the promise of fintech* (22 March 2019) <www.bankofengland.co.uk/quarterly-bulletin/2019/2019-q1/embracing-the-promise-of-fintech> accessed 10 September 2019

⁵ *ibid*

⁶ William Magnuson, 'Financial Regulation in the Bitcoin Era' (2018) 23(2) Stanford

legislators are aware of the operational efficiencies and opportunities FinTech solutions bring to the financial sector but are also wary of the challenges FinTech presents to existing financial regulatory frameworks which ensure the stability of the financial system.⁷

Notably, the global approach to achieving stability in the financial system has undergone numerous shifts in the past four decades.⁸ The collapse of the international monetary system in the 1970's and the rise of financial globalization has been accredited with increasing the volatility in global economic cycles.⁹ Consequently, the ensuing financial and banking crises in Latin America (1980's) and Asia (1997-8) led to a demand for the establishment of 'financial safety nets' with the aim of promoting financial stability.¹⁰ Each jurisdiction's safety net consisted of various prudential techniques geared towards preventing and mitigating the effects of systemic crisis. These included intuitions and supervisory tools "*ensuring banks are prudently run with adequate capital and liquidity to restrict operations and protective techniques once a crisis arises*".¹¹ Protective techniques comprise of regulatory rescue and deposit insurance schemes geared towards safeguarding depositor interest and helping financial institutions weather shocks in times of stress.¹²

However, policymakers identified a key issue with financial safety net arrangements namely, the promotion of moral hazard.¹³ Due to the protections in place, banks were disincentivised to guard against the risk in their asset portfolios and encouraged to make high risk investments with higher pay outs.¹⁴ Micro-prudential regulation and supervision was relied on as a mechanism to mitigate the effects of moral hazard.¹⁵ However, the Global Financial Crisis ('GFC') of 2008 demonstrated the growing trans-national integration of international financial markets and systems which increased the risk of contagion.¹⁶ Consequently, following the GFC the approach to promoting financial stability, especially in the United States of America (USA), European Union (EU) and the United Kingdom (UK), has extended past monitoring and ensuring the resilience of individual institutions.¹⁷ The new post-2008 regulatory regime, influenced by the G20 Financial Stability Board (FSB), also considers wider societal interests and is geared towards ensuring consumer protection and enhancing macro-economic stability.¹⁸ The safety net has been re-designed in three main areas:

- 1) Banking regulation and supervision, more specifically changes regarding implementation of macroprudential regulation and the increased capital buffers introduced by Basel III;¹⁹

Journal of Law, Business & Finance 159, 161.

⁷ Jan Smets, 'Fintech and Central Banks' (Speech at the Fintech and the Future of Retail Banking Conference, Brussels, 9 December 2016) <www.suerf.org/docx/1_ec5decca5ed3d6b8079e2e7e7bacc9f2_9467_suerf.pdf> accessed 10 September 2019

⁸ Syed Faiq Najeeb & Madaa Munjid Mustafa, 'Strengthening the Financial Safety Net : The Role and Mechanisms of Shariah-Compliant Deposit Insurance Schemes (SCDIS)', (2016) Islamic Financial Services Board Working Paper -06/03/2016, 1 < [www.ifsb.org/docs/2016-03_31%20Working%20Paper%20on%20SCDIS%20\(WP-06\)\(Final\).pdf](http://www.ifsb.org/docs/2016-03_31%20Working%20Paper%20on%20SCDIS%20(WP-06)(Final).pdf) > accessed September 10 2019

⁹ *ibid*

¹⁰ *ibid*

¹¹ Ross Cranston, *Principles of Banking Law* (2nd edition, OUP, 2002) 67.

¹² Najeeb & Mustafa (n 8) 1.

¹³ *ibid*

¹⁴ *ibid*

¹⁵ Ross Cranston and others, *Principles of Banking Law* (3rd edition, OUP, 2017) 27-28.

¹⁶ Najeeb & Mustafa (n 8) 1.

¹⁷ Ross Cranston and others (n 15) 31.

¹⁸ *ibid* 31-32.

¹⁹ *ibid* 33-24.

- 2) Special banking resolution arrangements outside of general company insolvency law such as the EU Bank Recovery and Resolution Directive 2014/59/EU and the US Dodd-Frank Orderly Liquidation Authority (OLA);²⁰
- 3) The extension of national deposit insurance coverage guided by the Basel Committee on Banking Supervision and International Association of Deposit Insurers, Core Principles for Effective Deposit Insurance Systems.²¹

However, although enhancements have been made to create the current financial safety net, it is widely acknowledged that when considering FinTech's role in financial services, the reach of the safety net is confined to entities within the traditional regulatory perimeter.²² Considerable infrastructural gaps and regulatory impediments exist.²³ Consequently, regulators in multiple jurisdictions have sought to tackle the question of how to regulate FinTech.²⁴

In the USA, the Office of the Comptroller of the Currency (OCC) and Securities Exchange Commission (SEC) have released white papers and solicited feedback on the application of regulations to FinTech businesses.²⁵ In 2018, the European Commission (EC) published its' FinTech action plan with the aim of developing a coordinated supervisory approach which promotes the use of FinTech in the EU Financial Sector.²⁶ In contrast, some jurisdictions have banned the use of certain FinTech applications and curtailed the actions of FinTech companies for failing to adhere to existing regulations.²⁷ However, other regulators in the UK, Singapore and Canada have sought to foster the development of FinTech firms by establishing innovation hubs and regulatory sandboxes to facilitate delivery of financial technology solutions to consumers in controlled environments.²⁸ The diverse responses to the regulation of FinTech demonstrates the difficulties regulators face with constructing suitable frameworks to meet the needs of the fast paced technological developments in the financial sector.²⁹ However, undoubtedly, some of the most extensive regulatory research has been conducted in the popular area of virtual currencies such as Bitcoin and the application of distributed ledger technologies commonly referred to as blockchain.³⁰ Nevertheless, Pflaum and Hateley observed that the international regulatory

²⁰ ibid 14.

²¹ ibid 89.

²² International Monetary Fund (IMF) , *Fintech: The Experience So Far* (2019) IMF Policy Paper 6/2019, 2
<www.imf.org/~media/Files/Publications/PP/2019/PPEA2019024.ashx> accessed September 10 2019

²³ ibid 1.

²⁴ ibid

²⁵ Office of the Comptroller of the Currency, *Supporting Responsible Innovation the Federal Banking System:An OCC Perspective* (March 2016) 2.
<<http://consumerbankers.com/sites/default/files/OCC%20whitepaper%20fin%20inno%2082%29.pdf>> accessed September 10 2019

²⁶ European Commission, *What is Fintech*
< https://ec.europa.eu/info/business-economy-euro/banking-and-finance/fintech_en> accessed September 10 2019

²⁷ Chao Deng, 'China's interference on Bitcoin Tests Currency's Foundations' *The Wall Street Journal* (18 September 2017) < <https://www.wsj.com/articles/china-widens-bitcoin-crackdown-beyond-commercial-trading-1505733976>> accessed 10 September 2019

²⁸ HM Treasury, The Financial Conduct Authority and The Bank of England, *Cryptoassets Task Force: final report* (2013)5
<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf> accessed 10 September 2019

²⁹ ibid 5.

³⁰ ibid 5.

community has demonstrated a reluctance to embrace the transformative potential of virtual currencies.³¹

The International Monetary Fund (IMF) and World Bank Group FinTech survey conducted amongst 96 of their member countries confirmed that while the majority of countries acknowledged the need to develop their legal frameworks, very few have developed frameworks, and close to half believed the existing legal frameworks were adequate to address the innovations in cryptoassets.³² This approach may have been based on previous financial stability analysis which indicated cryptoassets' threat to financial stability was either benign or small.³³ However, new entrants into FinTech markets with large established customer bases and name recognition deemed 'BigTech' could alter the financial services landscape.³⁴ Since the introduction of cryptocurrencies, minor shocks to financial markets have been registered, particularly in the banking industry which has witnessed the impact of the volatility of cryptoassets, cases of financial fraud, money laundering and terrorist financing.³⁵ Considering the growing use of cryptocurrencies, questions arise regarding the ability of the current financial safety net to assure financial stability and depositor protection.

This paper will contend that the current financial safety net is unsuitable for ensuring financial stability and depositor protection in the era of FinTech and cryptocurrencies. The examination will be limited to Bitcoin. The paper will note the inadequacies of the traditional financial system relating to the regulation of cryptocurrencies. The paper will consider the different international approaches to the regulation of cryptocurrencies mainly comparing the approaches of US, EU and UK. The creation of a Virtual Safety Net will be explored as a potential solution for combating the gaps identified in the traditional financial system.

II. WHAT IS MONEY?

The legal definitions provided for money have been inconsistent, this is mainly attributed to the fact that money has a multitude of functions which results in different meanings dependent on the legal situation.³⁶ For instance, if a statute stipulates an obligation be repaid by money '*in current coin of the realm*' the obligation cannot be discharged by bartering but only physical cash payment.³⁷ However, a much broader interpretation of the meaning of money may be undertaken in other situations. Although, the customer of a bank may claim to have their money in a bank, at law, property in the physical cash and coins deposited has been transferred to the bank. In reality, the depositor becomes a creditor of the bank.³⁸ However, his credit balance at the bank can be used to discharge financial obligations and thus may be construed as 'money'.³⁹ Similarly, the equitable doctrine of tracing does not solely apply to money in the form of physical currency, rather, it considers money as any asset identifiable either unmixed or part of a mixed fund.⁴⁰ An even broader approach to defining money can be found in relation to wills. Often, the

³¹ Isaac Pflaum & Emmeline Hateley, 'A Bit of a Problem: National and Extraterritorial Regulation of Virtual Currency in the Age of Financial Disintermediation' (2014) 45 *GEO J INT'L L* 1169,1172.

³² IMF (n 22) 18-19.

³³ Howard Davies, 'The disruptive impact of fintech' *Theneweconomy* (3 July 2019) < <https://www.theneweconomy.com/business/the-disruptive-impact-of-fintech>> accessed September 10 2019

³⁴ Financial Stability Board (FSB), *FinTech and market structure in financial services: Market developments and Potential financial stability implications* (14 February 2019) 12.

³⁵ Marcus Ayodeji Ararom, 'Regulation of virtual currencies in select jurisdictions: giving Nigeria a sense of direction' (2018) *Computer and Telecommunications Law Review* 13.

³⁶ Charles Proctor, *Mann on the legal aspect of money* (7th ed, OUP,2012) 6

³⁷ *ibid* 7.

³⁸ *ibid*

³⁹ *ibid*

⁴⁰ *Re Diplock v. Wintle (and associated actions)* [1948] Ch.465, 466.

Judiciary will determine the intention of the testator after reading the entire document. Therefore, the testator's reference to 'all my money' can also be deemed to include all real and personal property of the estate.⁴¹

These examples highlight the difficulties with developing a concise legal definition of 'money'. Since legal expression is determined by circumstances and terminology, individual assessment for each case is required.⁴² Further, Professor Goode notes that most of the rights for commercial parties arise from the use of bank transfers as the primary means of payment as opposed to money.⁴³ Consequently, the case law tends to focus on the concept of payment. Nevertheless, Bacon asserts a satisfactory legal definition of money cannot be derived exclusively with reference to the law, it should also include money's economic functions.⁴⁴ Typically, when economists define money they have a propensity to highlight four characteristics i.e. it acts as a medium of exchange, it is a means of measuring value, it is a store of value and a unit of account.⁴⁵ The divergent aims of law and economics means a shared definition is not possible. Thus, although a legal definition should consider money's functional and economic objectives, the legal approach will not encompass all the economic features.⁴⁶ Bacon observed the primary emphasis should be directed at money's ability to perform legal and contractual obligations.⁴⁷ This is evident in the frequently cited common law case of *Moss v Hancock*⁴⁸. It defines money as:

*"..that which passes freely from hand to hand throughout the community in final discharge of debts and full payment for commodities, being accepted equally without reference to the character or credit of the person who offers it and without the intention of the person who receives it to consume it or apply it to any other use than in turn to tender it to others in discharge of debts or payment for commodities."*⁴⁹

This definition embraces the functional aspects of money, however, arguably to obtain a holistic view of money as a mechanism for fulfilment of financial obligations, consideration must be given to the legal framework in which it operates.⁵⁰ Hence, the US Uniform Commercial Code when describing money, in addition to recognizing money as a medium of exchange, includes that it must be "*authorized by a domestic or foreign government.*"⁵¹ This description of money corresponds with traditional expressions of sovereignty. In accordance with the US Constitution, only Congress has the power to issue money and regulate its value.⁵² This suggests adoption of the means of exchange by the state is essential to describing money. Keynes contends that money cannot be considered money unless the state recognizes it can be used to discharge monetary obligations.⁵³ The existence and wide use of Fiat Currency internationally supports this argument. Fiat Currency is money that derives value due to government regulation rather than physical goods such as gold or silver, usually termed commodity money.⁵⁴

1. What is virtual currency?

In contrast, the Financial Action Task Force defines virtual currency as a "*digital representation of value that can be digitally traded and functions as (1) a medium of*

⁴¹ Proctor(n 36) 8

⁴² *ibid*

⁴³ *ibid*

⁴⁴ *ibid* 9.

⁴⁵ *ibid* 10.

⁴⁶ *ibid*

⁴⁷ *ibid*

⁴⁸ *Moss v Hancock* [1899] 2 QB 111

⁴⁹ *ibid*

⁵⁰ Proctor(n 36) 13.

⁵¹ Uniform Commercial Code(U.C.C) Section 1-201 (24) (2001).

⁵² United States Constitution(U.S.C.) Art 1 Section 8.

⁵³ Proctor(n 36) 13.

⁵⁴ Mohammed Ahmad Naheem, 'Regulating Virtual Currencies -the challenges of applying fiat currency laws to digital technology services' (2018) 35 (2) Journal of Financial Crime 562, 564.

exchange; and/or (2) a unit of account; and/or (3) a store of value, but does not have legal tender status (i.e., when tendered to a creditor, is a valid and legal offer of payment) in any jurisdiction. It is not issued nor guaranteed by any jurisdiction and fulfils the above functions only by agreement within the community of users of the virtual currency.”⁵⁵ Thus, the key distinguishing feature from fiat currency is that virtual currency is not recognized within a government regulatory framework.⁵⁶ This position is reaffirmed by the European Central Bank (ECB) in its report on Electronic Money Schemes whereby it states that it does not recognize virtual currencies such as Bitcoin as full forms of money from a legal perspective.⁵⁷

Nevertheless, there are instances where US courts have recognized virtual currency as money. In 2013 in the Eastern District of Texas, it was decided that the SEC could pursue a lawsuit against Trenton Shavers, the creator of an illicit Bitcoin Ponzi scheme who had defrauded his customers of 4.5 million dollars in Bitcoin. Shavers pleaded not guilty on the grounds that Bitcoin was not money. The judge held cryptocurrency could be traded for goods and services and payment of individual living expenses thus it could be recognized as money and its turnover could be regulated by the SEC.⁵⁸ Similarly, in the infamous Silk Road case involving an online platform used for selling illegal drugs, the defendant, Ross Ulbricht, alleged creator of the site was indicted by the Federal Bureau of Investigation (FBI) for unlawful operation of a money transmission service even though the site used Bitcoin as a means of exchange.⁵⁹ In this case, it was held that due to Bitcoin’s economic functions as a medium of exchange it could be considered money.⁶⁰ Consequently, it can be argued these two cases expanded the definition of money beyond government authorized currency.⁶¹

However, the above position conflicts with the US Internal Revenue Services (IRS) statement in notice 2014-21 which states that virtual currency does not have the status of legal tender in any jurisdiction.⁶² Further, in Germany, virtual currency is seen as units of accounts which are not legal tender which can be utilized as a private means of payment.⁶³ Likewise, in the United Kingdom, virtual currency is also considered private money.⁶⁴ Meanwhile, the Canada Revenue Agency categorizes Bitcoin as a commodity for tax purposes.⁶⁵ Therefore, although the American state courts may recognize virtual currency as a form of money, the US government in conjunction with international opinion leans towards solely identifying currency as legal tender.⁶⁶ Perhaps the ECB’s description of virtual currencies most succinctly clarifies the dominant position regarding what virtual currency is i.e. “a digital representation of value, not issued by a central bank, credit

⁵⁵ Financial Action Task Force (FATF), *Virtual Currencies Key Definitions and Potential AML/CFT Risks* (June 2014) 4.

⁵⁶ *ibid*

⁵⁷ Artemov, Nikolay Mikhailovich and others, ‘Regulation and control of virtual currency: to be or not to be’ (2017) 8 Issue 5(27) *Journal of Advanced Research in Law and Economics* 1425, 1429.

⁵⁸ *ibid*

⁵⁹ Anita Ramasastry, ‘Is Bitcoin Money? Lawmakers, Regulators and Judges Don’t Agree’ (*Verdict* 9 September 2014)
< <https://verdict.justia.com/2014/09/09/bitcoin-money>> accessed 10 September 2019

⁶⁰ *ibid*

⁶¹ *ibid*

⁶² Internal Revenue Service (IRS) Notice 2014-21
< <https://www.irs.gov/pub/irs-drop/n-14-21.pdf>> accessed 10 September 2019

⁶³ Mikhailovich n (57) 1431

⁶⁴ Bank of England, ‘Digital Currencies’
< <https://www.bankofengland.co.uk/research/digital-currencies>> accessed 10 September 2019

⁶⁵ Tara Mandjee, ‘Bitcoin, its Legal Classification and Its Regulatory Framework’ (2015) 15(2) *J. Bus. & Sec. L.* 157, 167.

⁶⁶ *ibid*

*institution or e-money institution which in some circumstances can be used as an alternative to money.*⁶⁷

2. Types of virtual currency

While it may be accepted that virtual currencies are a form of money, the term virtual currency can encompass numerous types of ‘currencies’ ranging from airline miles, vouchers systems, gaming coins to cryptocurrencies.⁶⁸ Further, the list of cryptocurrencies is also extensive and continually developing including Bitcoin, Ripple, Peercoin, Ether and Litecoin.⁶⁹ Notably, a cryptocurrency is a type of virtual currency whereby the holder of a unit of value uses cryptography to validate financial transactions.⁷⁰ In 2018, the website CoinMarketCap reported the registration of over 2000 cryptocurrencies.⁷¹ Virtual currencies can be further subdivided into convertible and non-convertible currencies.⁷² The key difference between these subdivisions is that convertible virtual currencies such as Bitcoin can be exchanged for fiat money, goods and services.⁷³ Conversely, non-convertible virtual currencies may be utilized by a closed group on a specific platform and cannot be exchanged for real currency.⁷⁴

3. How cryptocurrency works?

According to a Cambridge Center of Alternative Finance study of over 100 convertible cryptocurrency firms, it was found that there was an estimated 5.8 million cryptocurrency users in the world with 72 percent of the market share primarily users of Bitcoin.⁷⁵ Invented in 2008 by an internet user under the pseudonym Satoshi Nakamoto, Bitcoin is considered the pre-eminent convertible cryptocurrency.⁷⁶ Bitcoin is a decentralized digital currency which utilizes peer-to-peer networks to exchange value whereby formal financial intermediaries such as central banks or clearing houses are circumvented.⁷⁷ Bitcoin users sending and receiving payments are pseudonymous as the identity of the individual user is unknown. However, Bitcoin operates using blockchain protocols. Therefore, records of all entitlements occurring in the system are stored and shared on a public ledger called a blockchain that is immutable.⁷⁸ Public transactions are verified by volunteer users called ‘miners’ who utilize their computing power to group transactions chronologically into blocks and are compensated with new Bitcoin for their contributions.⁷⁹ Consequently, the platform employs a distributed decision making process as it relies on consensus in the community for authentication of transactions.⁸⁰ This amalgamation of distributive ledger technology, blockchain and telecommunications platform which broadcasts and validates entitlements although initially introduced in the Bitcoin network is the basis for the development of later cryptocurrency networks and is the reason why Bitcoin is the primary focus of this paper.⁸¹

⁶⁷ European Central Bank, *Virtual Currency Schemes- a further analysis* (February 2015) 4.< <https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemesen.pdf>> accessed 10 September 2019

⁶⁸ Mikhailovich n (57) 1429

⁶⁹ *ibid*

⁷⁰ Naheem (n 54) 564.

⁷¹ Coinmarketcap, ‘All Cryptocurrencies’ <<https://coinmarketcap.com/all/views/all/>> accessed 10 September 2019

⁷² Mikhailovich n (57) 1430.

⁷³ FATF (n 55) 7

⁷⁴ Ramasastry (n 59)

⁷⁵ Mikhailovich n (57) 1428.

⁷⁶ *ibid* 1429.

⁷⁷ Naheem (n 54) 564.

⁷⁸ *ibid*

⁷⁹ Magnuson (n 6) 166.

⁸⁰ *ibid*

⁸¹ Phillip Paech, ‘The Governance of blockchain financial networks’ (2017) 80 (6) MLR 1073, 1074.

Nevertheless, what does it mean to own virtual currency? Interestingly, Bitcoin akin to most virtual currencies does not actually exist since it does not have a real-world counterpart and thus is merely a unit of account.⁸² In fact, ownership of a Bitcoin refers to the ability to control the private key which facilitates transfers.⁸³ Each transaction on the Bitcoin network has a script signature. The script signature prompts the network to confirm the identity of the addressee in relation to the transaction value.⁸⁴ A transaction will only be authorised if the addressee has the private key which corresponds with the value recorded in the transaction.⁸⁵ Further, a key aspect of ownership is also linked to custody of wallets which holds one or more private keys that can be used to execute Bitcoin transactions that have been sent to the wallet owner's public address.⁸⁶ Therefore, Bitcoin can be stolen if private keys are not properly secured in the owner's wallet by password or the location where the private key is physically secured is compromised.⁸⁷

III WHAT ARE THE BENEFITS AND CHALLENGES?

To understand the increasing appeal of cryptocurrencies and the current regulatory stance towards its wider adoption, the benefits and challenges associated with the implementation of cryptocurrencies will be discussed below. Attention will be given to the analysis of key issues affecting the general use of cryptocurrencies in order to contextualise later analysis. Due to the time limitation of this paper all of the issues identified cannot be examined in detail. Consequently, the paper will primarily focus on developing upon the issues relating to financial stability and depositor protection in later arguments.

1. Benefits of cryptocurrency

Traditionally, financial regulation has primarily focused on fiat currencies which use tangible commodities such as coins and notes that have a 'central repository' such as a central bank and a single administrator.⁸⁸ One of the main advantages of digital currencies is that they are typically circulated via the internet and do not emanate from a single distribution centre.⁸⁹ They are not subject to government verification and usually only supervised by their creator and/or members of the special virtual community.⁹⁰ Consequently, virtual currencies operate outside of the traditional banking system and are not subject to existing regulatory and licensing requirements.⁹¹ These traits have made convertible virtual currencies a hot topic in regulatory fields.⁹² However, the use of fiat currency continues to dominate worldwide use due to its greater purchasing power.⁹³ Consequently, the operation of money services business capable of converting virtual currency to fiat currency is still necessary. Jurisdictions have varying positions regarding the trading of virtual currency for 'real' cash.⁹⁴ Some countries such as China have prohibited the holding, trading and conversion of cryptocurrencies while others such as Singapore have allowed or are still awaiting legislation.⁹⁵

Despite the patchwork application of legislation worldwide, Naheem notes that the increasing popularity of Bitcoin and other convertible virtual currencies is unsurprising as

⁸² *ibid* 1074.

⁸³ Pflaum and Hateley (n 31) 1776-1175.

⁸⁴ *ibid*

⁸⁵ *ibid*

⁸⁶ *ibid*

⁸⁷ *ibid* 1777.

⁸⁸ Naheem (54) 564.

⁸⁹ *ibid*

⁹⁰ *ibid*

⁹¹ *ibid*

⁹² *ibid* 568.

⁹³ *ibid* 564.

⁹⁴ *ibid* 568.

⁹⁵ *ibid* 564 Money Authority of Singapore, *Reply to Parliamentary Question on Virtual Currencies* (21 February 2014)

<<https://www.mas.gov.sg/news/parliamentary-replies/2014/reply-to-parliamentary-question-on-virtual-currencies>> accessed 10 September 2019

it addresses a gap in the market demand. Notably, over 1.7 billion of the world's population remains unbanked.⁹⁶ The design of Bitcoin facilitates increased access to financing due to the absence of an intermediary, transactions are faster and fees are significantly reduced when compared to conventional money transmission services.⁹⁷ To execute transactions all that is required is a computer or mobile device with internet access.⁹⁸ Since distributive ledger networks are publicly accessible, a number of users can obtain their own copy of the immutable ledger.⁹⁹ Therefore, verification of the truth is a simpler process as participants' data regarding transactions is updated concurrently. Consequently, the European Securities and Markets Authority (ESMA) have acknowledged settlement and reconciliation procedures on distributive ledger platforms are more efficient and cost effective than traditional channels.¹⁰⁰

Other advantages include providing users in jurisdictions plagued by inflation with the ability to store economic value outside local fiat currency and offering an alternative means of value exchange in states hampered by political instability.¹⁰¹ In Venezuela, the population is suffering from the plummeting value of the local currency the Bolivar.¹⁰² In an attempt to circumvent the failures within the traditional monetary system, cryptocurrencies are being utilised to make basic household and medical purchases.¹⁰³ Further, to avoid the sanctions imposed by the US, the Venezuelan Ministry of Economy in 2018 launched the 'Petro', a sovereign virtual currency. However, investors remain hesitant regarding linking the value of the Petro to barrels of oil.¹⁰⁴

2. Cryptocurrency challenges

Nevertheless, despite the advantages which virtual currencies facilitate, the underlying Distributive Ledger Technology (DLT) is still in the initial stages of development.¹⁰⁵ Consequently, there are a number of challenges hindering the widespread application of virtual currencies in the financial services industry.¹⁰⁶

3. Privacy

Transparency of the DLT platforms is often considered a benefit. However, the public has become increasingly aware of the economic value of their personal data.¹⁰⁷ A significant volume of information is required by transferors and transferees to process financial transactions i.e. location, gender or political views. Citizens are less willing to grant DLT platforms unrestricted access to personal data.¹⁰⁸ Transparent virtual currency platforms which share address and transaction amounts such as Bitcoin are therefore unsuitable for

⁹⁶ Naheem (n 54) 564; World Bank, 'Financial inclusion on the rise, but gaps remain, Global Findex Database Show' (April 19 2018) <<https://www.worldbank.org/en/news/press-release/2018/04/19/financial-inclusion-on-the-rise-but-gaps-remain-global-findex-database-shows>> accessed 10 September 2019

⁹⁷ Aaron Wright and Pimavera De Filippi, 'Decentralised Blockchain Technology and the rise of lex cryptography' (March 2015) 8 <<https://ssrn.com/abstract=2580664>> accessed 10 September 2019

⁹⁸ *ibid* 9.

⁹⁹ Paech (n 81) 1077

¹⁰⁰ HM Treasury (n 28) 22

¹⁰¹ Ararom (n 35) 3

¹⁰² Samuel Haig, 'Venezuela Petro Against the US Sanctions: History and use of the crypto' (*Cointelegraph*, 17 July 2019)

<<https://cointelegraph.com/news/venezuelan-petro-against-us-sanctions-history-and-use-of-the-crypto>> accessed 10 September 2019

¹⁰³ *ibid*

¹⁰⁴ *ibid*

¹⁰⁵ HM Treasury (n 28) 26

¹⁰⁶ *ibid* 27.

¹⁰⁷ Basel Institute on Governance, *Working Paper 28: Regulating cryptocurrencies: challenges and Considerations* (2019) 2.6

<<https://www.baselgovernance.org/publications/working-paper-28-regulating-cryptocurrencies-challenges-and-considerations#2.7>> accessed 10 September 2019

¹⁰⁸ HM Treasury (n 28) p.27

a variety of financial services.¹⁰⁹ The introduction of private or permissioned blockchains which provide a restricted environment for those invited to participate in the network ensures some degree of security and privacy.¹¹⁰ Further, the Bank of England's research into privacy on DLT networks indicates that cryptographic techniques can be altered to ensure that virtual currency transactions remain private between each participant while still sharing data with users on the platform.¹¹¹ Nevertheless, this functionality has a cost as it affects the scalability, transaction speed and security. Therefore, additional research is required to obtain desired efficiencies.¹¹²

4. Interoperability

In order to encourage wider adoption of DLT platforms standardisation is needed among the multitude of systems in the expanding industry.¹¹³ Issues arise due to DLT platforms' inability to communicate with each other due to differences in coding languages, protocols and privacy mechanisms.¹¹⁴ The ESMA notes that standardisation is required to realise many benefits of DLT systems particularly the reduction of reconciliation needs by establishing a single source for verification.¹¹⁵ A set of standards are currently under development by the International Organization for Standardization.¹¹⁶ However, it is unknown whether adoption of common standards will be successful.¹¹⁷ Meanwhile, in July 2019, the Japanese government with the backing of the Financial Action Task Force (FATF) has announced the intention to launch an international payment standard for cryptocurrencies similar to SWIFT.¹¹⁸ While the Japanese initiative may address some of the interoperability issues it remains unclear how the system will operate.¹¹⁹

5. Governance challenges

Due to the communal decision-making structure of DLT platforms there is no central authority to assist with resolutions. As a result, concerns arise regarding users establishing clear provisions about responsibilities.¹²⁰ Admittedly, this primarily affects 'permissionless' blockchains.¹²¹ However, the decentralised nature of the system also affects the ability to identify an addressee for enforcement of regulations.¹²² Software platform providers who are responsible for maintaining the software for Bitcoin and other public blockchains have no formal connection with each other and often reside in different jurisdictions.¹²³ Consequently, it is very difficult to regulate the software developers.¹²⁴

¹⁰⁹ *ibid* 27.

¹¹⁰ European Parliament (EP), *Cryptocurrencies and blockchain: Legal context and implications for financial crime, money laundering and tax evasion*, (July 2018) 15

<<https://www.europarl.europa.eu/cmsdata/150761/TAX3%20Study%20on%20cryptocurrencies%20and%20blockchain.pdf>> accessed 10 September 2019

¹¹¹ HM Treasury (n 28) 27

¹¹² *ibid*

¹¹³ HM Treasury (n 28) 22

¹¹⁴ Ryan Browne, 'Five things that must happen for blockchain to see widespread adoption' *CNBC* (1 October 2018)

¹¹⁵ European Securities and Markets Authority (ESMA), *Report: The distributed ledger technology applied to securities markets* (7 February 2017) 8

<https://www.esma.europa.eu/sites/default/files/library/dlt_report_-_esma50-1121423017-285.pdf> accessed 10 September

¹¹⁶ International Standards Organisation, 'Blockchain and distributed ledger technologies' (ISO, 2016) <<https://www.iso.org/committee/6266604.html>> accessed 10 September 2019

¹¹⁷ ESMA (n 115) 8

¹¹⁸ Takahiko Wada, 'Japan to lead development of SWIFT network for cryptocurrency' *Reuters* (18 July 2019)

¹¹⁹ *ibid*

¹²⁰ HM Treasury (n 28) 28.

¹²¹ *ibid*

¹²² Paech (n 81) 1085

¹²³ Government Office for Science, *Distributive Ledger Technology: beyond block chain*, (2015) 43

¹²⁴ *ibid*

Attempts have been made by regulators to control data sharing through local internet service providers however, this has proven to be only partially effective and contradicts democratic principles.¹²⁵ At present, virtual exchanges which act as intermediaries between virtual currency platforms and the traditional financial sector are the focal points of regulation. It is debatable if this approach is effective or that it can manage risks that threaten the entire blockchain network.¹²⁶

6. *Legal challenges*

Outside the realm of financial services regulation complications arise with the operation of DLT platforms and the General Data Protection Regulations (GDPR).¹²⁷ There is an inherent tension with GDPR's Article 17 right to erasure and the decentralised and immutable nature of some blockchain platforms.¹²⁸ DLT solutions have been developed to by-pass the conceptual issues with complying with GDPR. In relation to data stored on the blockchain that has been derived from data off-chain - a platform provider is deemed compliant with data erasure requirements by removing the off-chain data source.¹²⁹ Additionally, if access to a data source is restricted to a private key and the private key is made unobtainable this can be also considered data erasure. However, regulators acknowledge that further examination is needed for a more viable solution.¹³⁰ Further, the ability to comply with a user's right to erasure is called into question as there is no central authority to honour the request.¹³¹

7. *Speed of innovation*

In the ambit of financial services regulation there are also a number of challenges associated with the development of a regulatory framework for virtual currencies.¹³² In accordance with trends in the wider FinTech market the virtual currency sector is inexorably reliant on automation and algorithmic decision-making in order to operate.¹³³ This has made DLT platforms highly adaptive to external information.¹³⁴ As a result, since the emergence of Bitcoin the underlying blockchain network has evolved beyond transferring digital currencies to become more flexible regarding what can be recorded on the database¹³⁵ namely, the advent of the Ethereum Network, a peer-to-peer application which enables the trade of entitlements as well as the functioning self-executing computer protocols agreed between parties called smart contracts.¹³⁶

The distributed ledger technology has also been adapted to include the trade, settlement and issuance of financial assets such as shares and bonds effectively eliminating the need for stock exchanges.¹³⁷ Further, derivative products can also be exchanged on blockchain networks. New mechanisms for fundraising have also appeared, referred to as Initial Coin Offerings (ICO's), similar to Initial Public Offerings, whereby investors exchange cryptocurrency for crypto tokens issued by the company seeking funding.¹³⁸ Although these products are outside the ambit of this paper they have been mentioned to demonstrate the difficulties regulators have with keeping up with the fast paced advances in DLT.¹³⁹

¹²⁵ Paech (n 81) 1085

¹²⁶ Paech (n 81) 1085

¹²⁷ Perkinscoie, French Data Protection Authority issues guidance on application of Bitcoin to GDPR, (10 December 2018)

< <https://www.perkinscoie.com/en/news-insights/french-data-protection-authority-issues-guidance-on-application.html>> accessed 10 September 2019

¹²⁸ *ibid*

¹²⁹ *ibid*

¹³⁰ *ibid*

¹³¹ *ibid*

¹³² FATF (n55) 10.

¹³³ Magnuson (n 6) 175

¹³⁴ *ibid*

¹³⁵ Paech (n 81) 1074

¹³⁶ Peter Yeoh, 'Regulatory issues in blockchain technology' (2017) 25 (2) *Journal of Financial Regulation and Compliance* 196,198.

¹³⁷ *ibid* 201.

¹³⁸ HM Treasury (n 28) 11

¹³⁹ Naheem (54) 568

Prototype programs for regulatory reporting using DLT are currently being developed termed ‘RegTech’.¹⁴⁰ However, while RegTech is still in the pilot stages, the speed of innovation in many of the areas mentioned above means there is a lack of knowledge. Further, products are deliberately designed to function on the outskirts of the traditional financial system and thus not subject to regulation. This poses a substantial risk to financial participants due to informational asymmetry.¹⁴¹

8. Anonymisation

Regulators have also expressed concerns in relation to the underlying feature of cryptocurrencies which allows users to mask their identity owing to the encryption technology upon which it is built.¹⁴² Further, the rapid innovations in the virtual currency sector particularly in the realm of anonymisation products which deliberately seek to reduce the traceability of user transactions also pose an obstacle to regulation.¹⁴³ Bitcoin is categorised as a transparent blockchain, meaning a record of each transaction is readily available to the public.¹⁴⁴ However, in conventional banking, in order to facilitate inter-bank account transfers the owner of the account is subject to customer due diligence procedures and thus their identity is known.¹⁴⁵ In contrast, once Bitcoin is transferred to an address no personal identification details are required. Monero and Dash are cryptocurrencies which extend the ability to hide a user’s identity by ensuring all transactions and addresses remain private.¹⁴⁶ However, in some countries the structure of these platforms does not fall under the ambit of the traditional financial system in which banks and financial intermediaries must comply with stringent anti-money laundering legislation and Know Your Customer rules to combat banking secrecy.¹⁴⁷

9. Fraud

The anonymity attached to transacting with cryptocurrencies has made it an attractive tool for facilitating criminal activity such as terrorist financing, funding drug trafficking, tax evasion and money laundering.¹⁴⁸ Further, several prominent scandals linked to Bitcoin such as the Silk Road case mentioned above, Liberty Reserve and Mt Gox have detrimentally impacted the reputation of virtual currencies as accurate and reliable.¹⁴⁹ In 2014, the Financial Action Task Force cautioned against the use of virtual currencies by reporting on how Liberty Reserve, an unlicensed Costa Rican-based virtual money transmitter, laundered and facilitated transactions with over US\$6 billion dollars in illegal funds. Additionally, a criminal investigation into Japanese Bitcoin exchange operator MT Gox also revealed lax security and fraud eventually culminated in its collapse and the loss of millions of dollars for its users.¹⁵⁰

10. Additional challenges

Additional challenges include virtual currencies’ susceptibility to hacking and the volatility of the speculative value of cryptoassets.¹⁵¹ These challenges and incidents combined with the lack of virtual currency regulation in some countries has cultivated the image that virtual currencies are too risky.¹⁵² In the UK, the Financial Conduct Authority (FCA) on their website states ‘if you invest in cryptoassets, you should be prepared to lose

¹⁴⁰ HM Treasury (n 28) 5

¹⁴¹ *ibid*

¹⁴² Ararom (n 35) 3

¹⁴³ Naheem (n 54) 567

¹⁴⁴ Pflaum and Hateley (n 31) 1173

¹⁴⁵ European Parliament, *Virtual Currencies and central banks monetary policy: challenges ahead* (July 2018) 10

<https://www.europarl.europa.eu/cmsdata/149900/CASE_FINAL%20publication.pdf>
accessed 10 September 2019

¹⁴⁶ *ibid* 9.

¹⁴⁷ *ibid* 9.

¹⁴⁸ Yeoh (n 136) 199

¹⁴⁹ *ibid* 199.

¹⁵⁰ *ibid* 200.

¹⁵¹ HM Treasury (n 28) 12

¹⁵² Financial Conduct Authority (FCA), *Cryptoassets*, (7 March 2019)
<<https://www.fca.org.uk/consumers/cryptoassets>> accessed 10 September 2019

*all of your money.*¹⁵³ Yet, the international approach to regulation has largely been hands-off.¹⁵⁴ Institutions have been reluctant to regulate on the basis that early regulation could stifle the developmental potential.¹⁵⁵

However, from the inception of cryptocurrencies the intention was to disrupt the traditional financial system.¹⁵⁶ Bitcoin was birthed after the banking failures of the 2008 GFC when distrust in the government and monetary system was at its height.¹⁵⁷ It provided an avenue to escape the control of government and financial institutions. Thus, the impact of Bitcoin has been likened to disruptive innovations such as Uber in the taxi industry and Airbnb in the accommodation rental business.¹⁵⁸ Usually, a disruptive technology modifies the conventional value chain and challenges industry leaders to innovate or fail to survive.¹⁵⁹ Cryptocurrencies restructure how financial markets work but more specifically how banks operate.¹⁶⁰ This is problematic as the current financial safety net has been developed to prevent another market failure based on the issues with the banking system learnt from the 2008 GFC. Therefore, how does the financial safety net operate post-2008 in an era of disruptive tech such as cryptocurrency?

IV. HOW DOES THE TRADITIONAL BANKING MODEL PROTECT DEPOSITORS AND ENSURE FINANCIAL STABILITY?

In light of the regulatory challenges highlighted in section three, section four will outline the current model of banking and examine how the financial safety net works to prevent economic collapse and ensure stability and depositor protection in the current financial system. Although the safety net employs a number of tools including lender-of-last-resort facilities, forward looking regulatory supervision mechanisms and new frameworks such as ring fencing in support of its objectives, due to the limitations of this paper, only the post-2008 reforms in relation to Basel III capital adequacy requirements, the banking resolution regime and deposit insurance schemes will be examined. These three core pillars of the safety net will be critically reviewed within the cryptocurrency model.

1. The traditional banking model

The traditional model of banking is built on capital, either the collection of deposits or the issuing of loans.¹⁶¹ However, over the years the nature of banking has become more complex.¹⁶² Banks now perform and settle a host of transactions involving payment, sales and the investment and trade of securities.¹⁶³ Typically, banks operate in accordance with a fractional reserve system retaining only a portion of depositor's funds against liabilities. The remainder is used to make loans and pay depositors' interest.¹⁶⁴ The reserve system allows banks to act as intermediaries that connect financial actors with each other thereby creating a centralised network.¹⁶⁵ In this network the bank records and holds a single register with all the acquisitions, dispositions and account balances of market participants.¹⁶⁶ Trust in the stability of the financial system and the central authority is essential as parties rely on the validity of the register information to obtain consensus.¹⁶⁷

¹⁵³ *ibid*

¹⁵⁴ Jurgita Misevicuete, 'Blockchain and Virtual currency regulation in the EU' (2018) 19 (3) *Journal of Investment Compliance* 33

¹⁵⁵ *ibid*

¹⁵⁶ Paech (n 81) 1076.

¹⁵⁷ *ibid*

¹⁵⁸ *ibid*

¹⁵⁹ *ibid*

¹⁶⁰ Naheem (n 54) 564.

¹⁶¹ Ross Cranston and others (n 15) 5.

¹⁶² *ibid* 3.

¹⁶³ Paech (n 81) 1078.

¹⁶⁴ Ross Cranston and others (n 15) 4.

¹⁶⁵ *ibid* 3.

¹⁶⁶ Paech (n 81) 1078

¹⁶⁷ Wright & Filippi (n 97) 5.

However, confidence in the system can be eroded due to issues within a financial institution, the wider financial system and the economy.¹⁶⁸

2. *The post 2008 financial safety net*

The GFC was the result of several changes in the banking system namely; the removal of cross-border liquidity flow controls, technological advancements in communication, deregulation (particularly the USA's enactment of the Gramm-Leach-Bliley Act 1999 which repealed the Glass-Steagall Act 1933 thereby facilitating bank investment in capital markets) and changes in the macroeconomic environment.¹⁶⁹ In order to protect depositor's interest and promote financial stability, governments expended billions of dollars in taxpayer funds on bail-out-plans to prevent the collapse of undercapitalised systematically important banks.¹⁷⁰ This response was fueled by the realisation of the "too big to fail problem". The problem states that due to the increased growth and consolidation of the relationships between financial institutions, certain institutions' collapse created a chain reaction of financial institution failures which necessitated government rescue in the interest of protecting the broader society.¹⁷¹ However, public bailouts exacerbated issues of moral hazard, shifting the burden of imprudent bank management from large financial institutions to taxpayers.¹⁷² Consequently, following the GFC, the banking safety net has undergone extensive reform to combat the "too big to fail" (TBTF) institution.¹⁷³ In conjunction with microprudential supervision, regulatory parameters have broadened by increasing bank liquidity requirements, introducing special banking resolution procedures and extending deposit insurance coverage.¹⁷⁴

¹⁶⁸ Ross Cranston and other (n 15) 4.

¹⁶⁹ *ibid*; Gramm- Leach Bliley Financial Services Modernization Act of 1999

¹⁷⁰ Ross Cranston and other (n 15) 4.

¹⁷¹ Satish Thosar and Bradely Schwandt, 'Has 'Too Big to Fail' been solved? A Longitudinal Analysis of major U.S. Banks' (2019) 12 (1) *Journal of Risk Financial Management* 24.

¹⁷² Ross Cranston and other (n 15) 4

¹⁷³ *ibid* 27.

¹⁷⁴ Jaime Caruana, 'Post-crisis financial safety net framework: lessons, responses and remaining challenges' (Key note address conference on Bank resolution, crisis management and deposit insurance issues, Basel 6, December 2016)
<<https://www.bis.org/speeches/sp170105.htm>> accessed 10 September 2019

3. The cryptocurrency model

In contrast to the traditional model, cryptocurrencies operate in a decentralised network. Thus there is no single authority or record of transactions.¹⁷⁵ The record kept by the central authority with all the parties' entitlements is called an account and it forms the basis of the relationship between the intermediaries.¹⁷⁶ According to Paech the account "is *one of the linchpins of financial regulation*"¹⁷⁷ from which property and contractual rights are derived. Conversely, cryptocurrencies use distributed decentralised records where each person who has downloaded the blockchain software (also known as 'node') has a complete record of past, present and ongoing transactions.¹⁷⁸ Hence, blockchain introduces a new model into financial markets where there are no accounts and no intermediaries.¹⁷⁹ Therefore, the focal point of the majority of existing financial regulation is missing from the network.¹⁸⁰ Yet, cryptocurrency regulation remains largely undeveloped.¹⁸¹ The post-2008 regulatory regime still remains primarily responsible for preventing the next financial failure.¹⁸²

4. Capital Adequacy Requirements

Traditionally, prudential regulation is considered the first pillar of defence against financial failure.¹⁸³ The Basel Committee on Banking Supervision has developed voluntary international standards and guides for the prudential regulation of banks known as the Basel Accords.¹⁸⁴ Prior to 2008, the Basel capital adequacy frameworks relied on microprudential regulation which only acknowledged risk resulting from firm level oversight of individual financial institutions and did not consider the wider systematic impact of the actions of banking institutions in the economy.¹⁸⁵ For instance, one of the contributions to the destabilisation of the 2008 global financial system resulted from banks manipulation of the equity-and-asset ratio requirements to raise and sell funds.¹⁸⁶ While securitisation provided banks with a useful tool to efficiently raise capital, regulatory risk models were unable to identify the underlying risks associated with externalities such as the decline in the US subprime loan market which eventually contributed to the financial markets' instability.¹⁸⁷

Basel III aims to address the problems with the banking sector highlighted in the GFC by bolstering the resilience of the banks through enhanced regulation, supervision and risk management.¹⁸⁸ The new reforms focus on improving the quality of capital by emphasising preference for common equity¹⁸⁹ and increasing capital adequacy requirements to ensure institutions have better capital loss absorption in the event of failure.¹⁹⁰ The framework for identifying and categorising risk has also been strengthened, particularly the standards arising from capital market risk.¹⁹¹ In addition to the firm-specific regulations, Basel III

¹⁷⁵ Mikhailovich n (57) 1430.

¹⁷⁶ Paech (n 81) 1079.

¹⁷⁷ *ibid*

¹⁷⁸ *ibid*

¹⁷⁹ *ibid* 1078.

¹⁸⁰ *ibid* 1079.

¹⁸¹ IMF (n 22) 2

¹⁸² *ibid*

¹⁸³ Jaime Caruana (n 173)

¹⁸⁴ The Bank for International Settlements (BIS), 'The Basel Framework' <https://www.bis.org/basel_framework/index.htm?m=3%7C14%7C697> accessed 10 September 2019

¹⁸⁵ Ross Cranston and others (n 15) 33

¹⁸⁶ Rolf Weber & Rainer Baisch, 'Fintech- eligible safeguards to foster the regulatory framework' (2018) 33 *Journal of international Banking Regulation* 335, 343

¹⁸⁷ *ibid*

¹⁸⁸ Basel Committee on Banking Supervision, *High-level summary of Basel III reforms*, (2017) 1 <https://www.bis.org/bcbs/publ/d424_hlsummary.pdf> accessed 10 September 2019

¹⁸⁹ Ross Cranston and others (n 15) 43

¹⁹⁰ *ibid* 33.

¹⁹¹ Basel Committee on Banking Supervision (n 187) 1

also includes macroprudential components advising the use of capital buffers in time of credit growth which can be used to mitigate the procyclicality of system wide risks.¹⁹² Stricter leverage requirements have also been employed along with standards to curb excessive liquidity risk.¹⁹³

The EU has implemented Basel III through the Capital Requirements Regulation (CRR) and the Capital Requirements Directive (CRD) which has applied since 2014.¹⁹⁴ However, CRD/CRR extends the remit of Basel III by applying the standards to all banks in the EU rather than just systematically important banks.¹⁹⁵ In the US, the Federal Reserve Board transposed the new capital requirements in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.¹⁹⁶ In contrast to the EU, the US reforms apply to depository and non-banking financial institutions but exempts banks and companies with less than \$USD 500 million in assets.¹⁹⁷ Nevertheless, despite the different approaches both jurisdictions have introduced the capital requirements with the aim of limiting systematic risk exposures.¹⁹⁸

5. Threat of BigTech

Historically, the regulatory position towards cryptocurrency providers has been that they do not present a systematic threat to financial stability.¹⁹⁹ This assertion has mainly been attributed to the small size, assets, human resources and profits of FinTech firms when compared to traditional financial institutions.²⁰⁰ However, the FSB 2019 report on FinTech's potential financial stability implications warns "*this could change quickly with the deeper involvement of large technology providers.*"²⁰¹ The participation of BigTech providers in financial services has been a growing trend.²⁰² Since 2011, Amazon has been operating a merchant loan program which as of December 2017 had \$USD 2.6 billion in seller receivables. PayPal has also been lending to businesses in the UK, Japan and Australia.²⁰³ Apple has also hinted at the expansion of Apple pay into the crypto market and have already implemented the software to support cryptocurrency trading to the iOS app.²⁰⁴ The launch of Facebook's digital currency Libra in 2020 will grant Facebook's over 2.4 billion monthly users the ability to make financial transactions and has already been identified as a potential destabiliser of the global banking system.²⁰⁵

BigTech firms present a source of increased competition with traditional banks.²⁰⁶ Indeed, it is argued that BigTech firms could have a competitive edge over traditional banking due to their access to the latest technology, possession of extensive funds derived from large customer bases and ability to offer free or low cost services through cross-subsidisation.²⁰⁷

¹⁹² *ibid*

¹⁹³ *ibid*

¹⁹⁴ European Banking Authority (EBA), 'Implementing Basel III in Europe: CRD IV package' <<https://eba.europa.eu/regulation-and-policy/implementing-basel-iii-europe>> accessed 10 September 2019

¹⁹⁵ *ibid*

¹⁹⁶ Darryl Getter, 'US Implementation of Basel Capital Regulatory Framework' (*Congressional Research Service*, 9 April 2014) 2 <<https://fas.org/sgp/crs/misc/R42744.pdf>> accessed 10 September 2019

¹⁹⁷ *ibid* 6.

¹⁹⁸ Magnuson (n6) 186.

¹⁹⁹ Garrick Hileman & Michael Rauchs, *Global Cryptocurrency Benchmarking Study* (Cambridge Center for Alternative Finance, Cambridge University 2017) 25

²⁰⁰ FSB (n 34) 18

²⁰¹ *ibid*

²⁰² *ibid* 12.

²⁰³ *ibid*

²⁰⁴ Billy Bambrough, 'Apple reveal shock Bitcoin and Crypto 'interest' ahead of hyped iPhone 11 event' *Forbes* (9 September 2019)

²⁰⁵ Kari Paul, 'Libra: Facebook launches cryptocurrency in bid to shake up global finance' *The Guardian* (18 June 2019)

²⁰⁶ FSB (n 34) 2

²⁰⁷ *ibid* 5.

This in turn could result in BigTech obtaining a greater market share thereby changing the composition of financial services market away from traditional financial institutions covered by the safety net.²⁰⁸ Consequently, without regulation similar to TBTF banks pre-GFC, BigTech's growing participation increases the financial markets exposure to systematic risk and the likelihood of financial instability.²⁰⁹

6. Threat of cryptocurrency lenders

Additionally, even though cryptocurrency firms are considered too small to be considered a competitive threat to banking institutions, their interconnectedness to the traditional banking sector still pose a systematic threat.²¹⁰ Cryptocurrencies facilitate peer-to-peer lending more efficiently and at a reduced cost since the intermediary is cut from the transaction.²¹¹ The operation of virtual currency lending platforms vary whereby virtual lenders link borrowers to investors directly or lend against the balance sheet of the platform.²¹² However, some cryptocurrency platforms in addition to retail investor funding also obtain capital from banks, institutional investors and securitisation markets.²¹³ However, the cryptocurrency lender's use of securitisation is not subject to regulation regarding managing the risk exposure of asset backed securities in their portfolio. Consequently, funding could dry up due to recession resulting in the collapse of the cryptocurrency provider.²¹⁴ Moreover, a downturn in FinTech business could impact actors in the capital markets such as hedge funds who have purchased the loans.²¹⁵ This could spread to the balance sheet of banks if they issue credit to financial actors investing in crowdlending.²¹⁶ These loans would have a similar impact on the balance sheet of banks as securitisation pre-GFC whereby risk is disguised thus rendering banking capital adequacy requirements superfluous.²¹⁷ Consequently, the regulation of cryptocurrency lending platforms' conduct and integrity regarding the management of receivables is an important preventative measure against market instability.²¹⁸

7. Banking Resolution Regime

One of the overarching regulatory objectives post GFC is that the safety net ensures resilience of the financial system by allowing banks to fail without triggering financial contagion or requiring public bail outs.²¹⁹ The GFC highlighted that the use of corporate insolvency procedures for resolving banks were often too slow or ineffective in retaining the essential services.²²⁰ Further, cross-border issues arose when resolving multinational financial institutions, particularly globally systematically important banks (GSIB's) due to conflicting insolvency legislation.²²¹ Following the GFC, jurisdictions have developed special regimes for bank insolvency to ensure orderly resolution of banks. In November 2011, the FSB endorsed the *Key Attributes of Effective Resolution Regime for Financial Institutions* as the international standards.²²² The Key Attributes set out the features that

²⁰⁸ *ibid* 2.

²⁰⁹ *ibid*

²¹⁰ Weber & Baisch (n 85) 343

²¹¹ *ibid*

²¹² *ibid*

²¹³ Financial Stability Board (FSB 1), *Fintech credit market structure, business models and financial stability implications* (22 May 2017) 1
<https://www.bis.org/publ/cgfs_fsb1.pdf> accessed 10 September 2019

²¹⁴ Weber & Baisch (n 85) 343

²¹⁵ *ibid*

²¹⁶ Weber & Baisch (n 85) 343

²¹⁷ *ibid*

²¹⁸ William Magnuson (n6) 186

²¹⁹ Jaime Caruana (n 173)

²²⁰ Ross Cranston and others (n 15) 173

²²¹ European Parliament, *Bank Resolution Regimes (March 2012)*
<www.europarl.europa.eu/document/activities/cont/201103/20110316ATT15696/20110316ATT15696EN.pdf> accessed 10 September 4 2019

²²² Financial Stability Board (FSB 2), *Key attributes of effective resolution regimes for financial institutions* (October 2011) 1
<https://www.fsb.org/wp-content/uploads/r_111104cc.pdf> accessed 10 September 2019

national resolution regimes should put in place to facilitate orderly recovery and resolution of banks without exposing the tax payer.²²³ Further, under the Key Attributes, there are specific requirements for recovery plans to address an array of scenarios which include but are not limited to under-capitalisation, crisis management groups, resolvability assessments, recovery and resolution plans and institution specific cross-border cooperation agreements.²²⁴

The Banking Resolution and Recovery Directive (BRRD) establishes the harmonised legal framework for the resolution of credit institutions and investment firms in the EU.²²⁵ The directive mandates that firms implement advanced planning and restructuring and extends the powers of regulators to prevent crisis.²²⁶ Early intervention measures are granted to supervisors with the aim of restoring the viability or stabilising the resolution of firms. In the event of a failure the BRRD gives authorities a set of tools to safeguard public interest, protect depositors covered by deposit guarantee schemes and preserve critical functions.²²⁷ The four main tools include;

- 1) Bail-in tool; which allocates losses to shareholders and creditors instead of the public;²²⁸
- 2) Sale of business tool; this enables the resolution authority to sell whole or part of the institution to a third party;²²⁹
- 3) Bridge institution tool; transfers the viable assets and critical functions of the failing institution to a bridge institution with the aims or preserving the systematically important parts of the business and selling it;²³⁰
- 4) The asset separation tool; facilitates the transfer of assets, rights and liabilities of the institution to an asset management company to manage the insolvency if immediate liquidation would adversely impact market conditions;²³¹

The bank resolution tools may only be employed in the protection of public interest and do not substitute national insolvency laws but run alongside local resolution regimes.²³² The Single Resolution Mechanism is used for EU and non-EU states (that seek to join the SRM) to manage the cross-border insolvencies of significant groups within the Eurozone.²³³ In the UK, BRRD has been implemented through amendments to the Banking Act 2009 (the “Act”).²³⁴ In accordance with the Act, banks, building societies, investment

²²³ *ibid*

²²⁴ FSB 2 (n 220) 1

²²⁵ Council Directive 2014/59/EU of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Directive 82/891/EEC, and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU, 2012/30/EU and 2013/36/EU, and Regulations (EU) No 1093/2010 and (EU) No 648/2012, of the European Parliament and of the Council Text with EEA relevance [2014] *OJ L 173*

²²⁶ *ibid*

²²⁷ European Banking Authority (EBA 2), *Implementing Financial Stability Board (FSB) Key attributes on resolution matters* <<https://eba.europa.eu/regulation-and-policy/implementing-fsb-key-attributes-on-resolution-matters>> accessed 10 September 2019

²²⁸ Ross Cranston and others (n 15) 180

²²⁹ Federal Financial Supervisory Authority, 'Resolution' <https://www.bafin.de/EN/Aufsicht/Abwicklung/Abwicklung_abwicklung_node_en.html;jsessionid=02102B4FDE90A874C9CB64E168A1E9FE.2_cid372#doc11560760bodyText17> accessed 10 September 2019

²³⁰ World Banks Group, *Understanding bank recovery and resolution in the EU: A guide book* (Gugler 2017) 6

²³¹ *ibid* 6.

²³² Ross Cranston and others (n 15) 176

²³³ EBA 2 (n 225)

²³⁴ Bank of England, *The Bank of England approach to resolution* (October 2017) 12

companies and foreign subsidiaries are within the scope of the resolution regime.²³⁵ The Act builds on the BRRD by developing a framework whereby the Treasury, Bank of England and Financial Conduct Authority are the bodies responsible for determining which banks are ‘failing or likely to fail’ and decide which tools should be applied for resolution.²³⁶ The US uses similar resolution tools as the EU but has a different framework.²³⁷ In the US, the Federal Deposit Insurance Corporation (FDIC), Dodd-Frank Act and Federal Insurance Act (FDI Act) enact the regime. However resolution is reliant on the nature of the legal entity.²³⁸ For instance, financial holding companies are resolved by FDIC under bankruptcy law, insured institutions are resolved under the FDI Act and credit union liquidation is handled by the National Credit Union Administration.²³⁹ Further, different resolution rules apply to financial institutions designated as systematically important with \$USD 50 billion or more in assets.²⁴⁰ In relation to cross-border insolvency a single-point-of-entry strategy is utilised whereby losses are transferred to the parent company which is placed in bankruptcy.²⁴¹ The distinctions between the US and the EU’s interpretation of the Key Attributes is not novel, globally, each jurisdiction has developed unique resolution regimes. Consequently, cross-border insolvency remains an issue due to the territorialism of national authorities who prefer to restrict or ‘ring-fence’ the benefit of national intervention strategies to local constituents.²⁴² Nevertheless, effort has been made to develop an integrated international approach to addressing cross-border resolution. The FSB with the aim of greater convergence established the Principles for Cross-border Effectiveness of Resolution Actions.²⁴³

8. Insolvency regime and cryptocurrency

In contrast to the extensive work done to develop a bank resolution regime, cryptocurrency platforms do not have the benefit of an administrative framework which can be employed instead of insolvency procedures.²⁴⁴ Under the banking resolution regime, supervisors have the authority to temporarily suspend contract terms dependent on circumstances.²⁴⁵ The purpose of an administrative stay is to prevent the mass exodus of borrowers and cancelling of repurchase agreements should the bank fail.²⁴⁶ The operation of smart contracts in conjunction with crypto-currency lending platforms could threaten the effectiveness of this supervisory tool due to their unstoppable and autonomous nature.²⁴⁷ Paech notes the development of an “emergency stop” supervisory function is required to prevent automatic contract terminations within the blockchain network.²⁴⁸ Conversely, if

<<https://www.bankofengland.co.uk/-/media/boe/files/news/2017/october/the-bank-of-england-approach-to-resolution>> accessed 10 September 2019

²³⁵ *ibid*

²³⁶ Ross Cranston and others (n 15) 176 -177

²³⁷ John Crabb, ‘PRIMER: a comparison of EU and US bank resolution regimes’ (*International Financial Law Review*, 20 November 2018)

<<https://www.iflr.com/Article/3798145/PRIMER-a-comparison-of-EU-and-US-bank-resolution-regimes.html?ArticleId=3798145>> accessed 10 September 2019

²³⁸ *ibid*

²³⁹ European Parliament, *Liquidation of Banks: Towards an ‘FDIC’ for the banking union* (February 2019)2

<[https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/634385/IPOL_IDA\(2019\)634385_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/634385/IPOL_IDA(2019)634385_EN.pdf)> accessed 10 September 2019

²⁴⁰ Title 1 of The Dodd-Frank Act: *ibid* 3.

²⁴¹ Crabb (n 235)

²⁴² Paech (n 81) 1089

²⁴³ Financial Stability Board (FSB 3), *Principles of cross-border effectiveness of resolution actions* (3 November 2015) 1

<<https://www.fsb.org/2015/11/principles-for-cross-border-effectiveness-of-resolution-actions/>> accessed 10 September 2019

²⁴⁴ Paech (n 81) 1089

²⁴⁵ *ibid*

²⁴⁶ *ibid*

²⁴⁷ *ibid*

²⁴⁸ *ibid*

the smart contracts were terminated and then reversed it is unlikely third parties would want to continue business with a failing entity on the same terms.²⁴⁹

9. *Cryptocurrency and insolvency procedures*

Admittedly, the application of smart contracts with cryptocurrencies is optional. More pressing issues arise with the traditional application of corporate insolvency procedures and the cryptocurrency model.²⁵⁰ In a situation where there has been a hacking or theft from a cryptocurrency provider, the lack of regulatory framework mandating a capital buffer suggests the business is unlikely to have sufficient assets retained to fund restructuring.²⁵¹ Further, due to risks mentioned in section three traditional lenders are unlikely to offer loans to fund recovery.²⁵² The high speed nature of the virtual currency market also ensures that during any period of time the business is offline the asset base will suffer significant losses.²⁵³ Consequently, options for resolution are restricted to winding up.²⁵⁴

Despite the governance challenges mentioned in section three, if the platform provider is registered in a specific jurisdiction, local legislation will apply.²⁵⁵ However, with constant innovation in the market and the entrance of BigTech providers, company structures are becoming more complex.²⁵⁶ Therefore, access to standard cross-border resolution mechanisms will become essential.²⁵⁷ Additionally, in an insolvency the appointed practitioner will aim to identify, safeguard and sell viable assets of the failing firm,²⁵⁸ However, due to the internet based nature of cryptocurrency business, the bulk of assets tend to be intangible and the tangible assets are unlikely to yield substantial funds.²⁵⁹ Notably, Mt Gox when filing for bankruptcy listed two servers, a chair and 28 laptops.²⁶⁰ Considering the inappropriateness and inapplicability of the standard insolvency procedures, a separate specialist regime is necessary to ensure legal certainty, enforcement of user rights and maintain resilience in the system.²⁶¹

10. *Deposit insurance post GFC*

Deposit insurance schemes are the third pillar of the financial safety net.²⁶² The key purpose of these schemes has been to protect consumers and reduce the risk of bank runs thereby limiting contagion.²⁶³ It is based on the premise that if depositors know their funds are guaranteed in a bank failure they will be less likely to withdraw their deposits.²⁶⁴ After the GFC, the most commonly embraced response globally has been to increase deposit insurance coverage with some countries offering blanket guarantees.²⁶⁵ The crisis highlighted issues with schemes sources of funding, delays with reimbursing depositors and the education and awareness of depositors concerning insurance schemes.²⁶⁶ In 2014 the International Association of Insurance Systems reformulated a set of internationally

²⁴⁹ *ibid*

²⁵⁰ Lee Pascoe, 'Bankruptcy, recognition proceeding and recoveries in a cryptocurrency world' (*International Bar Association*, 22 March 2018)

<<https://www.ibanet.org/Article/NewDetail.aspx?ArticleUid=dd394ab4-b3d7-4f79-9888-67fba0a1cfe7>> accessed 10 September 2019

²⁵¹ *ibid*

²⁵² *ibid*

²⁵³ *ibid*

²⁵⁴ *ibid*

²⁵⁵ Paech (n 81) 1085

²⁵⁶ FSB (n 34) 12

²⁵⁷ Paech (n 81) 1103

²⁵⁸ Pascoe (n 248)

²⁵⁹ *ibid*

²⁶⁰ *ibid*

²⁶¹ Paech (n 81) 1103

²⁶² Ross Cranston and others (n 15) 88

²⁶³ D,W.Diamond and P.H Dymbig, 'Bank runs ,Deposit Insurance, and Liquidity' (1983) 91 (3) *Journal of Political Economy* 401,

²⁶⁴ Ross Cranston and others (n 15) 90

²⁶⁵ Caruana (n 173)

²⁶⁶ *ibid*

applicable Core Principles for Effective Deposit Insurance Systems in order to target the problems identified in the crisis.²⁶⁷ The Core Principles were developed as a benchmark to assess the effectiveness of national deposit insurance frameworks and do not pre-empt the implementation of additional measures to ensure effective operation of deposit insurance.²⁶⁸ The Core Principles address issues in the objectives and governance of the Deposit Guarantee Scheme's (DGS) relationship with safety net functions, cross-border issues, crisis management and contingency, membership, funding, public education, early detection and intervention and bank resolution.²⁶⁹

However, each jurisdiction's approach to developing a framework differs. Notably, the EU deposit insurance reforms have been geared towards harmonisation of coverage across member states and *ex ante* funding.²⁷⁰ The Directive 2014/49/EU institutes a minimum coverage of €100,000 in EU member states.²⁷¹ It also mandates that each EU member is required to cover the deposits of EU based foreign branches.²⁷² Whereas in the US, FDIC performs the dual role of deposit insurer and resolution authority. The US coverage is also higher at \$250,000 per depositor.²⁷³ Regardless of the discrepancies in the implementation of DGS there is consensus regarding DGS performing a key role in maintaining depositor confidence in the financial system.²⁷⁴

11. Cryptocurrency depositor protection

As a result of the challenges highlighted in section three the cryptocurrency market has been besieged with cases involving fraud and hacking.²⁷⁵ Quadriga, a Canadian based crypto exchange, owes C\$180 million in cryptocurrency after the sudden death of founder Gerald Cotton.²⁷⁶ According to court records, Cotton had sole knowledge of the passwords protecting the digital assets and consequently, the assets of 92,000 users are currently irretrievable.²⁷⁷ Although, the British Columbia Securities Commission (BCSC) was aware of the exchange's operations, they stated as there was no evidence Quadriga engaged in trade of the derivative "*BCSC does not regulate it.*"²⁷⁸ Creditors were also unable to obtain timely recourse from the court as the Nova Scotia Supreme Court has granted Quadriga creditor protection.²⁷⁹ In May 2019, one of the largest cryptocurrency exchanges Binance reported hackers stole \$40 million worth of Bitcoin.²⁸⁰ The New York Attorney General alleges Crypto exchange Bitfinex engaged in the cover up of the loss of \$850 million

²⁶⁷ International Association of Deposit Insurers (IADI), *IADI Core Principles for Effective Deposit Insurance Systems* (November 2014)
<<https://www.iadi.org/en/assets/File/Core%20Principles/cprevised2014nov.pdf>>
accessed 13 September 2019

²⁶⁸ Ross Cranston and others (n 15) 90

²⁶⁹ IADI (n 265) 2

²⁷⁰ Ross Cranston and others (n 15) 90

²⁷¹ European Commission, 'Deposit Guarantee Schemes'

<https://ec.europa.eu/info/business-economy-euro/banking-and-finance/financial-supervision-and-risk-management/managing-risks-banks-and-financial-institutions/deposit-guarantee-schemes_en> accessed 10 September 2019

²⁷² *ibid*

²⁷³ Federal Deposit Insurance Co-operation, 'Understanding Deposit Insurance'
<<https://www.fdic.gov/deposit/deposits/>> accessed 10 September 2019

²⁷⁴ IADI (n 265) 5

²⁷⁵ Matthew Leising, 'Wild crypto market's traders get something new: FDIC Protection'
Bloomberg (14 May 2019)

²⁷⁶ *ibid*

²⁷⁷ South China Morning Post, 'Quadriga cryptocurrency founder filed will 12 days before he died' *SCMP* (6 February 2019)

<<https://www.scmp.com/tech/blockchain/article/2185120/quadriga-cryptocurrency-exchange-founder-filed-will-12-days-he-died>> accessed 10 September 2019

²⁷⁸ Pedro Goncalves, 'Crypto exchange QuadrigaCX not regulated by Canadian securities watchdog' *International Investment* (8 February 2019)

²⁷⁹ *ibid*

²⁸⁰ Eric Lam, 'Hackers steal \$40 million worth of Bitcoin from Binance Exchange'
Bloomberg (8 May 2019)

dollars in co-mingled client and corporate capital.²⁸¹ Indeed, clients are exposed to crippling losses without the benefit of regulation mandating providers maintain depositor insurance coverage and have limited or often non-existent avenues for reimbursement using existing legal frameworks due to the unsuitability of insolvency procedures.²⁸²

However, traditional financial institutions are increasingly engaging in the crypto market. JPMorgan is currently conducting a trial run with corporate clients of its quorum blockchain based cryptocurrency “JPM Coin”²⁸³ Fidelity Investments, one of the largest asset managers in the world with \$2.46 trillion in assets under management, offers a custodial service for Bitcoins and as of May 2019, has begun trading Bitcoin on behalf of institutional investors.²⁸⁴ In light of the growing interconnectedness with cryptocurrencies exchanges and the traditional system extending deposit insurance scheme coverage or the creation of specialist scheme seems key to ensuring depositor protection and prevention of contagion.²⁸⁵

Notably, research into cryptocurrencies also indicates a correlation between instability in cryptocurrency markets and herding behaviour. In finance, herding describes the situation when market participants act in consensus based on reactions to certain announcements on the market.²⁸⁶ In some circumstances, a flash crash can occur due to amplified herding behaviour which causes a drastic decline in assets value irrespective of the economic foundations²⁸⁷ However, DGS’ have been linked with contributing to the reduction of bank herding behaviour and curbing of risk-taking²⁸⁸ Despite cryptoassets use by traditional financial institutions, there is no DGS requirement for cryptocurrency providers. This is concerning as the value of Bitcoin, Ethereum and several virtual currencies are determined by supply and demand in the market.²⁸⁹ Consequently, the price of digital assets has been plagued with inflationary issues and extreme volatility which has been partly attributed to the herd effect.²⁹⁰ As a result, Urquhart concluded the Bitcoin market was inefficient and thus a contributor to market instability.²⁹¹ An examination of the timing of Bitcoin market crashes supports this contention.²⁹² After the revelations of the Shavers Ponzi scheme and Mt Gox exchange failure Bitcoin crashed, dropping by 50% value in 48 hours. Similarly, the decision of South Korean regulators to shut down cryptocurrency exchanges in 2017 also led to a collapse.²⁹³ There is a risk that with the growing integration of cryptocurrency

²⁸¹ Matthew Leising (n 273)

²⁸² Doug Alexander, ‘Quadriga clients won’t get help from regulator on lost crypto millions’ *Bloomberg* (7 February 2019)

²⁸³ Daniel Palmer ‘JPMorgan to start customer trials of its ‘JPMCoin’ crypto’ *Coindesk* (25 June 2019)

²⁸⁴ Maggie Fitzgerald, ‘Fidelity is reportedly about to offer cryptocurrency trading to pros within a few weeks’ *CNBC* (6 May 2019)

²⁸⁵ Matthew Leising (n 275); FSB (n 34) 18

²⁸⁶ Dionisis Philippas, ‘Signal-Herding in cryptocurrency market’ (*SSRN*, 15 February 2019) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3350695> accessed 10 September 2019

²⁸⁷ Paech (n 81) 1089

²⁸⁸ Rasmus Ruffer, ‘Implicit Government Guarantees and Bank Herding Behaviour’ (1999) Economic Research Group of the Deutsche Bank discussion paper 6/99, 18

<<https://pdfs.semanticscholar.org/7fa5/115392d260c5fea71a65d531005ac678f7eb.pdf?ga=2.256780942.464412320.1567552776-1566200322.1567552776>> accessed 10 September 2019

²⁸⁹ Nathan Lewis, ‘What is the fundamental value of Bitcoin?’ *Forbes* (7 December 2017)

²⁹⁰ Paulo Vitor Jordao da Gama Silva and others, ‘Herding behaviour and contagion in the cryptocurrency market’ (2019) 22 *Journal of Behavioural and Experimental Finance* 41, 42.

²⁹¹ Andrew Urquhart, ‘The inefficiency of bitcoin’ (2016) 148 *Economic Letters*, 80, 82.

²⁹² Silva and others (n 290) 42.

²⁹³ Daniel Traian Pele and Miruna Mazurencu-Marinescu-Pele, ‘Metcalf’s law and log-period power laws in the cryptocurrencies market’ (2019) 13 *Economics: The Open-Access, Open-Assessment E-Journal* 1, 3.

with traditional institutions that the volatility of the crypto market could trickle in to the traditional financial system potentially creating a flash crash. Admittedly, the launch of a new category of cryptocurrencies called “Stable Coin” which are backed by assets such as gold or US currency offer greater price stability.²⁹⁴ However, without regulation mandating the use of Stable Coin most cryptocurrencies currently on the market remain susceptible to volatility.²⁹⁵

V. WHAT IS THE APPROACH TO VIRTUAL CURRENCY REGULATION IN THE EU, US AND UK?

This section will critically review the approaches taken to the regulation of cryptoassets in the EU, US and UK. These approaches will be contrasted with each other in order to identify the efficient techniques in each regulatory system and identify gaps which will be discussed in section six when considering an integrated approach to developing international standards for a virtual financial safety net capable of working in conjunction with the traditional safety net to promote stability and enhance depositor protection.

1. US

The regulation of virtual currencies in the US is dependent on whether they are categorised as convertible or non-convertible currencies and whether the platforms used are centralised or decentralised.²⁹⁶ Greater attention has been given to the regulation of convertible currencies by US regulators.²⁹⁷ Irregularities with the regulatory framework persist between Federal and state laws with some states viewing virtual currency as money and the remaining states and Federal government viewing it as a commodity.²⁹⁸

In 2013, the US Financial Crimes Enforcement Network (FinCEN) published guidance regarding the application of obligations under the Banking Secrecy Act (BSA) to persons “*creating, obtaining, distributing, exchanging, accepting, or transmitting virtual currencies*”.²⁹⁹ It identifies such persons as administrators and exchangers of virtual currencies and stipulates that they are subject to money services business (MSB) reporting and record-keeping regulations.³⁰⁰ Under FinCEN’s regulations, a virtual currency user is not a MSB.³⁰¹ The guidance clarifies that it does not introduce new expectations rather virtual currencies are subject to the existing regulatory framework. Therefore virtual currency MSBs must register with FinCEN and depending on the state, obtain a license.³⁰² Consequently, the virtual currency administrators must comply with the BSA/ the anti-money laundering and counter terrorism (AML/CFT) compliance programme, securities law, banking secrecy legislation and taxation.³⁰³ Persons who create and mine convertible virtual currencies and companies who buy and sell virtual currencies for their own benefit are exempt from the BSA- requirements.³⁰⁴

²⁹⁴ Sherman Lee, ‘Explaining Stable Coin the holy grail of cryptocurrency’ *Forbes* (12 March 2018)

²⁹⁵ *ibid*

²⁹⁶ Pflaum & Hateley (n 31) 1172

²⁹⁷ *ibid* 1173

²⁹⁸ Ararom (n 35) 16

²⁹⁹ Financial Crimes and Enforcement Network (Fin 1), *Financial application of FINCEN’s Regulations to persons Administering, Exchanging or using Virtual currencies*(18 March 2013)

<<https://www.fincen.gov/sites/default/files/shared/FIN-2013-G001.pdf>> accessed 10 September 2019

³⁰⁰ *ibid*

³⁰¹ *ibid*

³⁰² Financial Crimes and Enforcement Network (Fin 2), *Guidance to money services businesses on obtaining and maintaining banking services*(26 April 2005)

<<https://www.fincen.gov/sites/default/files/shared/fincenadv04262005.pdf>> accessed 10 September 2019

³⁰³ Ararom (n 35) 16

³⁰⁴ Financial Crimes Enforcement Network (Fin 3), *FinCEN publishes two rulings on*

US regulators have made compliance with the AML/CFT regime and reporting requirements a top priority to combat prevalence of fraud, money-laundering and terrorist financing in the crypto currency market. To prevent the exploitation of the anonymisation aspect of transactions, virtual currency exchanges as MSB's are subject to the same Know Your Customer and suspicious activity monitoring obligations as banking institutions.³⁰⁵ Further, section 314(b) of the USA PATRIOT Act of 2001 allows banks and money services business, once FinCEN has been given notice, to voluntarily share information for the purposes of identifying and reporting AML/CFT.

US regulators have linked compliance with the anti-money laundering requirements to the protection of their financial system. Consequently, the US criminal code has been extended to reduce criminal activity with cryptocurrencies. The FBI has the ability to prosecute US residents and foreigners for using virtual currency to commit wire fraud money laundering conspiracy and aiding and abetting.³⁰⁶ The construction of the US statutes circumvents the governance issues highlighted in section three by contending a virtual currency platform that utilizes a US telecommunication system to record and process transactions is considered to be operating within the US jurisdiction.³⁰⁷

In relation to the application of Basel III requirements, the Basel rules do not explicitly apply to cryptoassets.³⁰⁸ However, in March 2019, the Basel Committee acknowledged cryptoassets have the potential to raise financial stability concerns and increase risk exposure of banks.³⁰⁹ Therefore, the Committee has developed a set of minimum prudential expectations related to banks cryptocurrency exposures and related services.³¹⁰ This includes requiring due diligence prior to acquisition of the cryptoassets such as conducting risk analyses of virtual currency's impact on internal and external operations of the bank and ensuring personnel have the technical expertise to assess risk.³¹¹ Also recommended is the adoption of a risk management framework for cryptoassets that is integrated with the existing bank AML and governance regime.³¹² Ensuring regular public and supervisory disclosures on cryptocurrency activities, accounting treatment and associated mitigation strategies is advised.³¹³ Notably, these standards are not legally binding and at present there is no US legislative instrument mandating their implementation.

However, the Office of Comptroller of Currency (OCC) has begun accepting National Bank Charter applications.³¹⁴ The application is geared towards FinTech companies engaged in the business of non-depository banking.³¹⁵ In practice, the OCC will apply existing banking licensing and supervisory regulation including capital liquidity and risk management requirements to FinTech companies.³¹⁶ In contrast to conventional banks,

Virtual Currency Miners and investors (30 January 2014)

<<https://www.fincen.gov/news/news-releases/fincen-publishes-two-rulings-virtual-currency-miners-and-investors>> accessed 10 September 2019

³⁰⁵ Fin 2 (n 299)

³⁰⁶ Pflaum & Hateley (n 31) 1201.

³⁰⁷ *United States v Trapilo* 130 F. 3d 547, 551 (2d Cir. 1997); *ibid* 1203

³⁰⁸ Iam Withers, 'Crypto-assets pose risks to global banks, warns Basel Committee' *Reuters* (13 March 2019)

³⁰⁹ Bank for International Settlements, *Statement on crypto-assets* (13 March 2019)

<https://www.bis.org/publ/bcbs_nl21.htm> accessed 10 September 2019

³¹⁰ *ibid*

³¹¹ *ibid*

³¹² *ibid*

³¹³ *ibid*

³¹⁴ Sullivan and Cromwell LLP, 'Special Purpose Fintech National Bank Charters' (*Sull*, 3 August 2018) <<https://www.sullcrom.com/files/upload/SC-Publication-Special-Purpose-Fintech-National-Bank-Charters.pdf>> accessed 10 September 2019

³¹⁵ Office of the Comptroller of Currency (OCC), *OCC begins accepting national bank charter applications from financial technology companies*, (31 July 2018)

<<https://www.occ.gov/news-issuances/news-releases/2018/nr-occ-2018-74.html>>

accessed 10 September 2019

³¹⁶ Weber & Baisch (n 85) 342

special purpose banks will be subject to enhanced supervision and supervisory standards modified based on business model and products.³¹⁷

Similarly, there is no specialist resolution regime in relation to cryptoassets. Under Section 541(a) of the Bankruptcy Code estate property includes “*all legal or equitable interests of the debtor in property as of the commencement of the case, wherever located and by whomever held.*” Consequently, subject to specified exceptions, cryptocurrency is considered “intangible property” of the debtor’s estate if owned on the date of filing.³¹⁸ Nevertheless, this categorisation has been limited to fraudulent transfers in accordance with Section 550 of the Bankruptcy Code.³¹⁹

More recently, FDIC protection has been extended to the cryptoasset market. Safra Bank in partnership with crypto trading platform SFOX has become the first to secure FDIC insurance for user accounts linked to cryptocurrency trading.³²⁰ The product is specifically aimed at institutional investors and offers the ability for traders to hold funds in their own name.³²¹ However, insurance only covers the cash deposits and not the cryptoassets of users.³²² Nevertheless, the segregated nature of accounts rather than the co-mingled omnibus holding of accounts characteristic of exchanges such as Quadriga aids in simplification of insolvency procedures.³²³ The clarity of the account structure facilitates better identification of clients’ legal rights especially in circumstances where users are subject to differing national legislation.³²⁴

2. UK/EU

In contrast to the US, the EU FinTech regulatory framework is in its infancy. The main challenge hindering the development of the cryptoasset supervisory regime is that Member States have more stringent laws relating to FinTech than the overarching EU laws.³²⁵ Therefore, FinTech companies seeking to operate in multiple Member States must navigate different rules.³²⁶ Additionally, since 2013 the EBA’s approach to regulating currency has been to discourage financial services providers from engaging with the virtual currency market due to its high risk exposures.³²⁷ To curb risk exposure the EBA proposed a prospective regime that requires that those seeking to participate in virtual currency markets must be a legal person. Further, incorporation must be in an EU state which will be responsible for regulating and supervising the operation of the virtual currency platform and ensuring compliance with risk mitigation strategies identified.³²⁸ Theoretically, the suggested virtual currency framework would only seek to address or “shield” where the cryptoasset market intersects with traditional regulated financial institutions.³²⁹

Under Article 9 of the EBA’s founding legislation the EBA is required to monitor existing financial activities and establish guidelines and recommendations with the intention of

³¹⁷ OCC (n 3111) ; *ibid*

³¹⁸ U.S Code Title 11 Bankruptcy s541; *Re Hashfast Technologies LLC v Marc A Lowe*

³¹⁹ U.S Code Title 11 Bankruptcy s550: INSOL, ‘Cryptocurrency and its impact on insolvency and restructuring’ (29 May 2019) 23
<special%20Report%20Cryptocurrency%2029%20May%202019%20FINAL%20(2).pdf> accessed 10 September 2019

³²⁰ Leising (n 273)

³²¹ *ibid*

³²² *ibid*

³²³ European Emissions Trading Scheme, ‘Omnibus client accounts-economical but risky’ <<https://www.emissions-euets.com/internal-electricity-market-glossary/563-omnibus-client-account>> accessed 10 September 2019

³²⁴ *ibid*

³²⁵ Weber & Baisch (n 85) 339

³²⁶ *ibid*

³²⁷ European Banking Authority, *EBA Opinion on Virtual Currencies* (4 July 2014) .6
<<https://eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>> accessed 10 September 2019

³²⁸ *ibid* 39

³²⁹ *ibid* 44

promoting a safe and stable financial system.³³⁰ Akin to the US approach, the EBA recommends virtual currency providers be subject to existing regulations applicable to financial services providers regarding capital requirements, IT system security and supervisory regime.³³¹ However, initial reform has primarily focused on including virtual currency exchanges and wallet providers in the definition of entities subject to the Fifth Anti-Money Laundering Directive (5AMLD).³³² Following the Directive's implementation in July 2018, virtual currency exchanges must seek registration in their Member States. Further, virtual currency providers like the US's MSBs are obliged to adhere to due diligence requirements and institute policies and procedure to identify and prevent AML/CFT.³³³

Despite the recent reforms, overall the EU's approach to virtual currency regulation has been mainly exploratory.³³⁴ In 2017, the EBA conducted a mapping exercise to determine the financial services and FinTech products offered by providers and their respective regulation in each Member State.³³⁵ Further analysis was required in areas regarding: registration of sandbox and innovation hubs, prudential risk and opportunities for credit institutions, e-money institutions, consumer protection, and FinTech business models etc.³³⁶ The ECB's Digital Currency Task Force examined the implication for financial stability and maintains "*Crypto-assets currently do not pose a material risk to financial stability in the euro area.*"³³⁷

As an EU member, the UK's crypto-asset regulatory framework and assessment of virtual currencies threat to financial stability mimics the EU.³³⁸ In March 2015, the UK Government welcomed the development of cryptocurrency as a form of payment in the financial system and prioritised the introduction of AML/CFT regulation. The Money Laundering Terrorist Financing and Transfer of Funds (information on the payer) Regulations 2017 implement the Fourth AMLD in June 2017. It is expected the 5AMLD will be transposed by 2020, however this remains subject to Brexit.³³⁹

Whereas the US has established strict capital guidelines and requirements, UK regulators are reluctant to regulate FinTech business in the event it stifles the development of firms due to their inability to obtain funding or licences.³⁴⁰ As an alternative to requiring traditional licences and a solution to the speed of innovation in the crypto-asset market the

³³⁰ Council Regulation (EC) 1093/2010 of 24 November 2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC [2010]_OJ L 331

³³¹ Aneta Vondrackova, 'Regulation of Virtual Currencies in the European Union' (2016) *Charles University in Prague Faculty of Law Research Paper No. 2016/III/3*, 8

³³² Ararom (n35) 5

³³³ European Commission, 'Statement by first vice president Timmermans, Vice-President Dombrovskis and Commissioner Jourova on the adoption by the European Parliament of the 5th Anti-money laundering Directive' (19 April 2018) <https://europa.eu/rapid/press-release_STATEMENT-18-3429_en.htm> accessible 10 September 2019

³³⁴ Weber & Baisch (n 85) 344

³³⁵ *ibid* 343

³³⁶ *ibid* 340

³³⁷ European Central Bank, *Crypto-assets implications for financial stability, monetary policy and payments and market infrastructures* (May 2019) 22 <<https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op223~3ce14e986c.en.pdf>> accessed 10 September 2019

³³⁸ Bank of England, 'Digital Currencies' <<https://www.bankofengland.co.uk/research/digital-currencies>> accessed 10 September 2019

³³⁹ The institute of chartered accountants in England and wales, 'Fifth anti-money laundering directive' <<https://www.icaew.com/technical/legal-and-regulatory/anti-money-laundering/fifth-anti-money-laundering-directive>> accessed 10 September 2019

³⁴⁰ Weber & Baisch (n 85) 337

Financial Conduct Authority (FCA) has developed Sandbox Regulation.³⁴¹ This approach has been followed in countries around the globe. DNB (De Nederlandsche Bank) has been operating a sandbox from 2016 and Lithuania is working on blockchain sandbox and testing the creation of virtual companies in 2019.³⁴² A regulatory sandbox is a program that allows start-up FinTech companies to test innovative ideas in a live market under a simplified and controlled regulatory environment.³⁴³

Both authorised and unauthorised firms can be accepted as a sandbox participant. On approval from the FCA, sandbox participants enjoy numerous benefits including reduced marketing costs while ensuring the consumer safeguards.³⁴⁴ An accepted participant has increased access to funding and the benefit of a customisable regulatory regime overseen by the FCA.³⁴⁵ There are two test periods a year which run for six months each.³⁴⁶ In order for the FinTech firm to meet the eligibility criteria the applicant must; (1) undertake regulated business or support regulated financial services business in the UK, (2) exhibit genuine innovation, (3) produce customer benefit, (4) require a sandbox and (5) be ready for testing in the real market.³⁴⁷ Regardless of the benefits, participants are restricted by the objectives of the sandbox and must comply with the regulator.³⁴⁸

The FCA has also spearheaded the creation of the GFIN (Global Financial Innovation Network) - a network of 38 countries and 11 foreign regulators and related organisations.³⁴⁹ Launched in January 2019, GFIN creates a 'global sandbox', with the objective of reducing the time it takes to bring innovative ideas to international markets and providing a setting for regulators to exchange ideas about approaches, challenges or policy questions in different jurisdictions.³⁵⁰ The primary core functions are:

1. To act as a network of regulators to collaborate and share experiences of innovation in respective markets;
2. To provide a space for joint RegTech work to collaborate knowledge regarding solutions and challenges;
3. To provide firms with an environment to test and develop cross-border solutions.³⁵¹

The UK's use of sandboxes has sought to address the challenges arising from the high speed of innovation in the cryptocurrency market, however, there has been a lack of development in the corresponding hard law to ensure crypto providers operate within the financial safety net.³⁵²

³⁴¹ Financial Conduct Authority, 'Regulatory Sandbox' (3 July 2018)

<<https://www.fca.org.uk/firms/regulatory-sandbox/regulatory-sandbox-cohort-4-businesses>> accessed 10 September 2019

³⁴² Claus Christensen, 'The use of regulatory sandboxes in Europe and Asia' *Regulation Asia* (6 September 2018)

³⁴³ Weber & Baisch (n 85) 337

³⁴⁴ Financial Conduct Authority (FCA), 'Applying to the regulatory sandbox' (20 February 2019) <<https://www.fca.org.uk/firms/regulatory-sandbox/prepare-application>> accessed 10 September 2019

³⁴⁵ Weber & Baisch (n 85) 337

³⁴⁶ Weber & Baisch (n 85) 337

³⁴⁷ FCA (n 340)

³⁴⁸ *ibid*

³⁴⁹ Financial Conduct Authority, 'Global Financial Innovation Network' (9 August 2019) <<https://www.fca.org.uk/firms/global-financial-innovation-network>> accessed 10 September 2019

³⁵⁰ *ibid*

³⁵¹ *ibid*

³⁵² *ibid*

VI WHAT DOES THE FINANCIAL SAFETY NET LOOK LIKE IN THE ERA OF FINTECH?

This section will, in consideration of the information discussed in previous sections, highlight the gaps in the existing safety net and based on legislative frameworks examined namely, the EU, UK, and US, propose solutions which can be built on in later works for the creation of a virtual safety net.

In accordance with arguments made in earlier sections the application of the current financial safety net is unsuitable for ensuring financial stability and depositor protection.³⁵³ Further, international regulators' refusal to extend the parameters of the financial safety net to include the cryptoasset market should be viewed with unease.³⁵⁴ Regulators' refusal to recognise convertible virtual currency as legal tender has not hindered the development of the virtual currency platforms.³⁵⁵ Indeed, cryptocurrencies such as Bitcoin and Ethereum continue to grow in popularity.³⁵⁶ The unique decentralised aspect of the platform allows it to cater to previously untapped segments of the banking population and the adaptable nature of the DLT technology ensures that cryptocurrency is here to stay.³⁵⁷

Admittedly, the challenges with the construction of the underlying DLT platform has slowed the world wide adoption of cryptocurrency.³⁵⁸ However, strides are rapidly being made to circumvent these issues³⁵⁹ namely, the development of permissioned cryptocurrency platforms to combat privacy issues, international payment standards to address interoperability and the introduction of Stable Coin to enhance stability.³⁶⁰ Nonetheless, more work needs to be done in these areas. However, the public's risk exposure resulting from the speed of innovation in the crypto-market, issues with governance of DLT platforms and their susceptibility to money laundering and terrorist financing demands the involvement of regulators.³⁶¹ Considering these issues, the current stance that a specific regulatory framework geared towards cryptocurrency is not needed and that current legislation will suffice is untenable.³⁶²

1. The safety net gaps

An examination of the application of the post-2008 financial safety net has revealed a number of gaps in the net's coverage regarding the assurance of financial stability and depositor protection when applied to the cryptocurrency model.³⁶³ Despite the new Basel III capital adequacy requirements claiming to take into consideration micro-prudential and macro-prudential risk in order to prevent financial instability, they do not apply to cryptocurrency providers.³⁶⁴ Arguments claiming cryptocurrency does not pose a risk to the stability of the financial system appear outdated.³⁶⁵ They fail to consider the potential for contagion that BigTech entrants could have on the wider financial system as well as the growing interconnectedness between the cryptocurrency market and traditional financial institutions.³⁶⁶ The unregulated transnational integration of large financial institutions in the cryptocurrency market mimics the destabilizing elements which contributed to the

³⁵³ IMF (n 22) 2

³⁵⁴ Pflaum & Hateley (n 31) 1172.

³⁵⁵ Naheem (n 54) 564

³⁵⁶ Coinmarketcap (n 71)

³⁵⁷ Naheem (n 54) 564; Magnuson (n 6) 175

³⁵⁸ Naheem (n 54) 568

³⁵⁹ Takahiko (n118); EP (n 110); Sherman Lee(n 294)

³⁶⁰ *ibid*

³⁶¹ Yeoh (n 136) 199

³⁶² IMF (n 22) 2

³⁶³ FSB (n 34) 18; Matthew Leising (n 274)

³⁶⁴ Hileman & Rauchs (n 199) 25

³⁶⁵ FSB (n 34) 18

³⁶⁶ *ibid*

GFC.³⁶⁷ Similar to the pre-GFC financial system, the safety net ignores potential macroprudential risk i.e. cryptoassets.³⁶⁸

Likewise, the second pillar of the safety net, the banking resolution regime does not apply to crypto providers.³⁶⁹ Although, a lot has been done to allow GSIBS to fail without endangering the taxpayer, the linkages have not been made with cryptocurrency as a threat to public interest.³⁷⁰ Akin to banks pre-2008, the general insolvency procedures are not suitable for crypto providers.³⁷¹ The internet based nature of the crypto markets means that the speed of doing business has made many of the insolvency tools inapplicable.³⁷² This is a concern where crypto lenders engage in business with traditional institutions and cannot comply with actions of bank supervisory tools.³⁷³ Additionally, users have ineffective means of enforcing rights through traditional insolvency regimes that predominantly rely on companies having access to tangible assets to provide recourse.³⁷⁴ Thus the linchpin of risk mitigation regulation is inapplicable.³⁷⁵

By failing to extend DGS, public protections are stripped away from cryptocurrency users. DGS aim to protect consumers and prevent bank runs however, regulators' refusal to extend the parameters to include crypto firms fails to acknowledge the reality that the cryptocurrency market is a growing multibillion dollar alternative to banking where millions of users remain unprotected.³⁷⁶ In fact, cryptocurrency users are more vulnerable, since they face the same issues as depositors in traditional financial institutions stemming from under-capitalisation but lack the protection from regulation requiring providers to undertake resolvability assessments, recovery and resolution plans and due to the unsuitability of general and cross-border insolvency.³⁷⁷ Further, the increasing engagement and investment of large multi-national traditional financial institutions in the volatile crypto market increases the traditional financial system's exposure to a market crash from runs initiating in the crypto market.³⁷⁸ Consequently, the impact DGS have as a stabilising mechanism is insufficient when considering the extension of the financial system into the virtual currency market.

2. Conclusion the Virtual Safety Net

In conclusion, when cataloging the gaps within the existing safety net, the reasons for governance in the virtual currency market largely correspond to the rationale behind the existing governance framework.³⁷⁹ Consequently, the crypto-asset market requires a functionally equivalent regulatory regime.³⁸⁰ In the US, UK and EU the implementation of the three pillars of the safety net into domestic legislation is indicative of the international community's confidence in the safety net for risk mitigation in the global financial system.³⁸¹ Although each jurisdiction approaches the construction of the safety net's framework in different ways such as methods of implementation, asset coverage of institutions and delegation of supervisory responsibilities, the core international standards and guidelines are implemented.³⁸² However, an examination of the existing regulatory framework in the US, UK and EU also reveals that while some aspects of the

³⁶⁷ Weber & Baisch (n 85) 343

³⁶⁸ *ibid*

³⁶⁹ Paech (n 81) 1089

³⁷⁰ Hileman & Rauchs (n 199) 25

³⁷¹ Pascoe (n 250)

³⁷² *ibid*

³⁷³ Paech (n 81) 1089

³⁷⁴ Pascoe (n 248)

³⁷⁵ Paech (n 81) 1103

³⁷⁶ Diamond and Dymbig (n 263); Fitzgerald (n 284); Lam (n 280)

³⁷⁷ FSB 2 (n 220) 1

³⁷⁸ Silva and others (n 290) 42

³⁷⁹ Paech (n 81) 1109

³⁸⁰ *ibid*

³⁸¹ IADI (n 265) 5; FSB 3 (n 243); Magnuson (n6) 186

³⁸² *ibid*

cryptocurrency model can be integrated into the current safety net, many of the features of the safety net remain unsuited to the cryptocurrency model.³⁸³

Therefore, the approach towards governance of the cryptocurrency model should not wholly disregard the current safety net for the creation of a separate virtual currency regulatory regime.³⁸⁴ Rather, cryptoasset firms should be integrated into the existing safety net framework where possible and new mechanisms capable of grappling with the unique features of DLT platforms built upon existing risk mitigation tools within the net. In effect, creating a virtual extension of the financial safety net. This approach to the regulation of virtual currency firms is already in operation albeit in a fragmented and delayed manner.³⁸⁵

The US' expansion of the definition of MSBs to include virtual currency exchanges and the EU's amendments in the 5AMLD which subjects virtual currency firms to the existing AML/CFT regime irrespective of the anonymity challenges of DLT are prime examples of integration into the existing framework.³⁸⁶ Similarly, existing bank licensing, capital adequacy requirements and supervisory regulations can be amended to incorporate virtual currency firms. The viability of this approach is evident in the US' development of the FinTech National Bank Charters.³⁸⁷ Nevertheless, guidance concerning the application of the current Basel III minimum standards should be reassessed in light of financial stability concerns and cryptoasset risk exposure. While, the Basel Committee has developed minimum prudential expectations in relation to virtual currency exposures more work is needed regarding updating the existing requirements.³⁸⁸ For instance, it is recommended that the cryptoasset risk management framework be integrated in the existing banking regime but the committee does not provide guidance regarding approaches to monitoring compliance or risk weighting of crypto-assets.³⁸⁹

In relation to the bank resolution regime, it is clear many of the tools used to protect depositors are ill-equipped to handle the resolution of cryptocurrency providers.³⁹⁰ However, the post GFC approach of creating a specialist resolution regime for systematically important financial institutions should be considered in relation to BigTech providers.³⁹¹ At this time it is unclear how a systematically important crypto-asset institution resolution regime could be developed. Further, proposing a structure would require extensive research beyond the scope of this paper. However, it is clear a virtual currency provider's maintenance of reserve accounts backed by cash or gold, regulation mandating the implementation of segregated accounts and the development of common standards regarding handling of cross-border crypto-insolvency procedures will be key elements necessary for the operation of a crypto-asset provider resolution regime.³⁹²

In contrast to crypto insolvency procedures, FDIC's extension of insurance to cryptocurrency trading accounts demonstrates DGS can be implemented with little change to the existing safety net regulations.³⁹³ While this step is commendable, extending insurance protections to users dealing with volatile cryptocurrencies such as Stable Coin should be considered.³⁹⁴ Nevertheless, these protections in conjunction with those

³⁸³ *ibid*

³⁸⁴ Paech (n 81) 1109

³⁸⁵ Fin 1 (n 299); Sullivan and Cromwell LLP (n 314; Ararom (n35) 5

³⁸⁶ Fin 1 (n 299); Ararom (n35) 5

³⁸⁷ Office of the Comptroller of the Currency, 'OCC Begins accepting national bank charter applications from financial technology companies' (31 July 2018) <<https://www.occ.gov/news-issuances/news-releases/2018/nr-occ-2018-74.html>> accessed 10 September 2019

³⁸⁸ Bank for International Settlements (n 309)

³⁸⁹ *ibid*

³⁹⁰ Pascoe (n 250)

³⁹¹ FSB 2 (n 222)

³⁹² Lee (n 294); European Emissions Trading Scheme (n 323); Paech (n 81) 1103

³⁹³ Leising (n 273)

³⁹⁴ Lee (n 294)

mentioned above only apply to a small segment of the users in the jurisdictions with the applicable legislation.

Outside of the AML/CFT regime there is little consensus in western cryptocurrency regulation.³⁹⁵ The EU's delayed approach to cryptocurrency regulation and narrow focus on developing areas that intersect with the traditional banking regime combined with the UK's exploratory hands-off approach to FinTech regulation do not contribute to enhancing financial stability and depositor protection in the global financial system.³⁹⁶ Lessons learnt from the GFC have made it clear that the global financial system is linked.³⁹⁷ Consequently, financial stability and depositor protections can only be assured through an international collaborative approach.³⁹⁸

Therefore, the development of common global standards providing guidance for the implementation of each pillar in the safety net in relation to virtual currency providers or, as this paper has collectively deemed them, the "virtual safety net extension" is required.³⁹⁹ The UK's GFIN initiative and Japan's development of an international cryptocurrency payment network holds promise and is indicative of the growing trend towards the creation of an international virtual currency regulatory framework.⁴⁰⁰ However, the speed at which systematically important financial institutions and BigTech companies are engaging in the largely unregulated cryptoasset market outstrips the development of the relevant regulation.⁴⁰¹ Consequently, it could be concluded that in accordance with the CEO of Monzo while the last financial crisis concerned credit and liquidity, the next financial crisis "*is going to be technology.*"

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³⁹⁵ Fin 1 (n 299); Sullivan and Cromwell LLP (n 314); Ararom (n35) 5

³⁹⁶ European Banking Authority (n 327); Weber & Baisch (n 85) 337

³⁹⁷ Najeeb & Mustafa (n 8) 1

³⁹⁸ Ross Cranston and others (n 15)

³⁹⁹ *ibid*

⁴⁰⁰ Takahiko (n118); Financial Conduct Authority (n 349)

⁴⁰¹ FSB (n 34) 18; IMF (n 22) 2