The University Of Sheffield.

EVALUATING THE VIABILITY OF CRYPTOCURRENCIES WITHIN THE LEGAL REGIME FOR ELECTRONIC PAYMENTS IN ENGLISH LAW

A Thesis submitted to the University of Sheffield, School of Law, in partial fulfilment of the requirements for the degree of Doctor of Philosophy

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Evaluating the viability of cryptocurrencies within the legal regime for electronic payments in English law

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LIST OF ABBREVIATIONS

2EMD	Electronic Money Directive II
AISP	Account Information Service Providers
AML	Anti-Money Laundering
B2B	Business-to-Business
BIS	Bank of International Settlements
BoE	Bank of England
BTC	Bitcoin
CBDC	Central Bank Digital Currency
CCP	Committee on Consumer Policy
CFTC	Commodity Futures Trading Commission
CJEU	Court of Justice of the European Union
CNY	Chinese Yuan Renminbi
CPMI	Committee on Payments and Market Infrastructures
CPSS	Committee on Payments and Settlement Systems
DLT	Distributed Ledger Technology
ECB	European Central Bank
EEA	European Economic Area
EMD	Electronic Money Directive
EMD	Electronic Money Directive
EU	European Union
EUR	Euros
FBI	Federal Buruea of Investigations
FCA	Financial Conducts Authority
FIO	Foundation for Inter-wallet Operability
FOIA	Freedom of Information Act
FPS	Faster Payment Systems
GBP	Great British Pounds Sterling
GDP	Gross Domestic Product
GFC	Global Financial Crisis
HD	Hierarchically Deterministic
HMRC	Her Majesty's Revenue and Customs
HS2	High Speed 2
IBDE	Inter Bank Data Exchange
ICO	Information Commissioner's Office
ICO	Initial Coin Offering
IMF	International Monetary Fund
IOU	I Owe You
IP	Internet Protocol
IRS	Internal Revenue Service

IT	Information Telecommunications
KYC	Know Your Customer
LTF	Legal Theory of Finance
MFA	Multiple-Factor Authentication
MiFiD	Markets in Financial Instruments Directive
MMT	Modern Monetary Theory
NBER	National Bureau of Economic Research
NPSO	New Payment System Operator
O&G	Overend Gurney
OECD	Organisation for Economic Co-operation and Development
P2P	Peer-to-Peer
P-A	Principal-Agent
PAR	Payment Accounts Regulations
PCA	Proceeds of Crime Act
PIDA	Public Interest Disclosure Act
POS	Point of Sales
PoW	Proof-of-Work
PSD	Payment Services Directive
PSD II	Payment Services Directive 2
PSO	Payment Service Operators
PSP	Payment Service Providers
PSP	Payment Service Providers
PSR	Payment Service Regulator
PWC	Price Water Coopers
QE	Quantitative Easing
RegTech	Regulatory Technology
RTGS	Real Time Gross Settlement System
SEC	Securities and Exchange Commission
SEPA	Single Euro Payments Area
SIFI	Systemically Important Financial Institutions
SSP	Settlement Service Provider
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TTP	Third Party Payment Providers
UK	United Kingdom
USD	United States Dollar
WEF	World Economic Forum
WWI	World War

JOURNAL ABBREVIATIONS

Am. Econ. Rev.	Amercian Economic Review
Am. J. Sociol.	American Journal of Sociology
Am. Pol. Sci. Rev	American Political Science Review
Ariz. L. Rev.	Arizona Law Review
B.U. J. Sci. & Tech. L.	Boston University Journal of Science & Technology Law
B.U.L. Rev.	Buston Universit Law Review
Banking Law J.	Banking Law Journal
Bell J. Econ.	Bell Journal of Economics and Management Science
Brook. J. Int'l L.	Brooklyn Journal of International Law
Camb. J. Econ.	Cambridge Journal of Economics
Cardozo Arts & Ent. L.J.	Cardozo Law's Arts and Entertainment Law Journal
Case W. L. Rev.	Case Western Reserve Law Review
Case West. R. J. Int'l. L.	Case Western Reserve Jounral of International Law
Columbia Law Rev.	Columbia Law Review
Comm. ACM	Association of Communication Machinery
Comput. Fraud & Secur.	Computer Fraud & Security
E. L. Rev.	European Law Review
Econ. Hist. Rev.	Economic History Review
Econ. J.	Economic Journal
Econ. Polit. Weekly	Economic and Poltical Weekly
Edin. L.R.	Edinburgh Law Review
Eur Competition L. R.	European Competition Law Review
Eur. J. Hist. Econ. Thou.	European Journal of the History of Economic Thought
Eur. J. Law. Econ.	European Journal of Law and Economics
Eur. J. Polit. Econ.	European Journal of Political Economy
Geo J Int'l Law	Georgetown Journal of International Law
Harv. J.L.	Harvard Journal of Law and Technology
H. Sci. Tech. Law J.	Hastings Science and Technology Law Journal
Indep. Rev.	Independent Review
Info. Tech. & Privacy L.	Marshall Journal of Information Technology & Privacy Law

Int. J. Law Info. Tech.	International Journal of Law and Information Technology
Int. J.L.M.	International Journal of Law and Management
Int. T.L.R.	International Trade Law and Regulation
J. Comp. Econ.	Journal of Comparative Economics
J. Consum. Aff.	Journal of Consumer Affairs
J. Econ. Hist.	Journal of Economic History
J. Econ. Issues	Journal of Economic Issues
J. Econ. Lit.	Jounral of Economic Literature
J. Econ. Perspect.	Journal of Economic Perspectives
J. Econ. Stud.	Journal of Economic Studies
J. Law Econ.	Journal of Law and Economics
J. Law Soc.	Journal of Law and Society
J. Money, Credit & Bank.	Journal of Money, Credit & Banking
J. Polit. Econ.	Journal of Political Economy
J. Post Keynes. Econ.	Journal of Post-Keynesian Economics
J.I.B.L.R.	Journal of International Banking Law and Regulation
L.M.C.L.Q.	Lloyd's Maritime and Commercial Law Quarterly
Minn. L. Rev.	Minnesota Law Review
N. C. Banking Institute	North Carolina Banking Instiute
NYU J. Legis & Pub. Pol	New York University Journal of Legislation & Public Policy
Public Admin.	Public Administration
Q. J. Econ.	Quarterly Journal of Economics
Res. Hist. Ec.	Research in the History of Economic Thought
Rev. Pol. Econ.	Review of Political Economics
Sci. Ameri.	Scientific American
Utah L. Rev.	Utah Law Review

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Curtice v. London city and Midland Bank Ltd. [1908] 1 KB 293

Dalkia Utilities Services Plc v. Celtech International Ltd [2006] EWCH Civ 63

Diplock v. Wintle [1948] Ch 465

Foley v. Hill (1842) 2 HLC 28

Gilbert v. Brett (1605) 2 Howells State Trials 114

Grand China Logistics Holdings (Group) Ltd v. Spar Shipping AS [2016] EWCA Civ

Guardian Ocean Cargoes Ltd. v. Banco do Brasil [1994] CLC 243

Holmes v. Governor of Brixton Prison [2004] EWHC 2020

Libyan Arab Foreign Bank v. Bankers Trust Co. [1989] QB 728

Mardorf Peach & Co. Ltd v Attica Sea Corporation (The Laconia) [1977] AC 850

PT Berlian Laju Tanker TBK v. Nuse Shipp.ing Ltd [2008] 1 C.L.C. 967

R. v. Peddy 1996] AC 815

R. v. Teresko [2018] Crim. L.R. 81

Re *Charge Card Services Ltd* (1998), No.2 Ch. 497

Skatterverket v. Hedqvist [2016] Case C-264/14 STC 372

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United States v. Ulbricht, 858 F.3d 71 (2nd Cir, 2018), 85

Westminster Bank Ltd. V. Hilton (1926) 43 TLR 124

Wright v. Reed (1790) 3, T.R.

ABSTRACT

Cryptocurrencies and its underlying distributed ledger technology (DLT) introduces innovations to digital property and methods of information storage. Although capable of many uses, its most famous implementation is creating a new digital asset that underpins a system of direct 'peer-to-peer' online payments. This emerging technology disrupts the existing centralised digital payments system; itself underpinned by a model of 'trust' derived from state-franchised institutions. In this emerging world of cryptocurrencies, 'trust' does not derive from state-franchised institutions or intermediaries, but the technology and its network. Cryptocurrencies pose a range of conceptual and regulatory challenges. For instance, it challenges orthodox theoretical explanations of money. Furthermore, it re-enacts tensions between state control of monetary operations and private involvement in payments. Significantly, cryptocurrencies raise concerns regarding the adaptability of law in responding to emerging problems of financial crime, privacy protection and socio-economic participation.

This thesis assesses the extent to which existing legal frameworks for digital payments can respond to the cryptocurrency phenomenon. It focuses on the Electronic Money and Payment Service Regulations of 2011 and 2017, respectively. The thesis also analyses Common Law rules governing bank payments to ascertain the extent of applicability and suitability. The thesis argues that the underpinning private nature of cryptocurrencies make current legal frameworks incompatible. It also argues that, by mostly pursuing economic goals of efficiency, existing regulatory tools are inadequately prepared to respond to peculiar concerns thrown up by cryptocurrencies. As such, in its current framework, orthodox regulatory responses seem incapable of resolving the myriad of issues associated with the complex relationships between asset holders and crypto institutions. Ultimately, by prioritising efficiency over other values like privacy and inclusion, existing legal and regulatory rules implicitly protect the positional power of incumbents and preserve the hierarchical structure of the financial system. In this regard, the law has become an instrument deployed in curtailing cryptocurrencies from widespread adoption, for the benefit of the state and its franchise institutions.

Legal reform is necessary. However, the thesis argues that such reform must not solely focus on economic goals which underpin market-focused legal interventions. Instead, an intervention must aim to promote innovation, protect consumers, widen participation and preserve personal liberties. The policymaker must first objectively assess the benefits that cryptocurrencies introduce into the payments system. By conducting such an objective assessment, this thesis ultimately concludes that, given the growing decline in cash use, cryptocurrencies are a viable alternative online payment instrument inbuilt with more robust protections and encouraging participation.

DECLARATION

I, Kingsley D. Udofa, the author, confirm that the Thesis is my own work. I am aware of the University's Guidance on the Use of Unfair Means (www.sheffield.ac.uk/ssid/unfair-means). This work has not previously been presented for an award at this, or any other, university.

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For David and Ekaette,

my darling Mom and inspirational Dad.

CHAPTER I

INTRODUCTION

1.1 THEMES OF THE THESIS

1.1.1 Background of the Study

Money, as a primary medium of payment, has been with us for a long time. Over its history, money has continued to evolve and taken on a variety of different forms, which itself has spurred changes to payments.[1] As an instrument of payment, money does not operate in isolation. Typical of payment systems in most modern economies, payment instruments, participating institutions and processes interact to facilitate monetary circulation and sustenance of economic activity.[2] Just as with money, payment systems often experience changes caused by a myriad of external and internal factors. These changes often manifest in the creation of new payment instruments and processes, constant re-writing of the rules of engagement, emergence of new institutional players with evolved functions, and ultimately, alterations to customer preferences.

The advent of the internet and its related advancements on finance have inaugurated a transformation in how the entire financial system works. Such digital transformations are causing the rise of new innovations, particularly those funded by venture capital and other monetary investments.[3] This thesis focuses on technological advancements in digital currencies built on ledger technologies and encryption which have, over the past few years, stirred up debates and led to the emergence of new payment products, services, processes and institutional players.

[1] Bank of International Settlement, 'Committee on Payment and Settlement Systems Report: A Glossary of Terms Used in Payments and Settlement Systems' (2003), available at <https://www.bis.org/cpmi/glossary_030301.pdf> accessed 21 March 2016

[2] Gogoski, R., 'Payment Systems in Economy – Present End Future Tendencies' (2012) 44(22), *Precedia – Social and Behavioural Sciences,* pp. 436 – 445.

[3] Girasa, R., *Regulation of Cryptocurrencies and Blockchain Technology* (Palgrave Macmillan 2019)

In early 2009, crypto-assets[4] burst onto public consciousness when a so-called programmer, Satoshi Nakamoto,[5] published his ideas for a new online currency – The Bitcoin Currency.[6] This has been followed by the emergence of an entire ecosystem private online payments, complete with products, processes and institutions, operated as an alternative to traditional bank-driven digital payments.[7] This emerging digital innovation seem poised to increase in popularity, especially for facilitating online payment transactions, dealings in securities and general information management.[8] Often perceived as a response to lowering costs both to financial institutions and their customers, addressing security challenges to existing online payments and issues of anonymity, innovations in crypto-assets however pose concerns for the payments systems, its incumbent operators and consumers of financial products. There are also questions on the implications posed by this emerging private-driven system to state power, sovereignty and monetary operations. But even more crucial, cryptography in payments re-echo issues of security and privacy in online interactions. This thesis is then very much about the role of law in moderating the relationship between this emerging private-driven technology and existing state or state-franchised payments operations, especially in relation to financial inclusion, consumer protections, systemic risks and private liberties.

1.1.2 Conceptual Problems and Prevailing Taxonomy

From inception, there has been significant misperception about how to describe or conceptualise this emerging technology. It has been described as differently, either as "virtual-currency" "digital-money" or "cryptocurrency" as an umbrella term depicting

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[4] Also known and used interchangeably with "virtual currency" or "crypto-currency"

[5] The pioneer of the cryptocurrency revolution remains anonymous. See: <https://www.cnbc.com/2017/10/27/bitcoins-origin-story-remains-shrouded-in-mystery-heres-why-it-matters.html> accessed 19 March 2020

[6] *Satoshi Nakamoto* published an online piece containing the operational details upon which other cryptocurrencies were later developed titled the 'Bitcoin Paper' is available at <https://bitcoin.org/bitcoin.pdf> accessed 23 November 2015

[7] Bank of England, 'One Bank Research Agenda: Response to Fundamental Change' (2015) available at <https://www.bankofengland.co.uk/-/media/boe/files/research/one-bank-research-agenda---summary.pdf?la=en&hash=B2C820FBF6A960C4A625C2DAB5B5B6CE4FEDF120> accessed 19 September 2016

[8] Cryptoassets Taskforce Final Report (2018), available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf> accessed 18 January 2019

how it works. At its core, the technology is essentially a "cryptographically secured digital representation of value or contractual rights that uses some type of distributed ledger technology (DLT) and can be transferred, stored or traded electronically."[9] In other words, crypto-assets are digital ledger technologies upon which assets are transacted and useful for different purposes. Grappling with this problem, the UK government taskforce on cryptoassets was lunched up the Chancellor of the Exchequer in March 2018 bringing together HM Treasury, the Financial Conducts Authority (FCA) and the Bank of England to, amongst other things, "provide an overview of the UK cryptoasset market and outline a framework differentiating between different types of cryptoassets and DLT."[10] This distinction has become particularly important to separate out the different parts of the financial system in which the underlying DLT can become operationally applicable. The UK Taskforce has therefore observed that, being a type of technology that enables the sharing and updating of records in a distributed and decentralised way, DLT can be used like any conventional database to store a range of data, such as ownership of existing financial assets like shares or digital assets like Bitcoin. Following this observation, the Taskforce identified three broad types of cryptoassets i.e., Exchange tokens, Security tokens and Utility tokens. This thesis is particularly only focusing on the exchange tokens which will be used interchangeably with cryptocurrencies.

Admittedly, the Taskforce has anchored its approach to conceptualising cryptoassets on the different broad use-cases currently evident in the UK. It is however noteworthy to state that this approach is in no way conclusive given that cryptoassets continue to evolve and may therefore further evolve in the future. In its final report, the Taskforce recognises this fact and notes that "reliable and comprehensive data are not yet available, given the market is still in its early stages and developing rapidly." To put it more succinctly, cryptoasset technology is experiencing continuous flux and perhaps should not be treated as a fully formed and stable phenomenon. This fluidity is tackled in the thesis by taking a restrictive approach, limiting its analytic scope only to cryptoasset payment features. In other words, the analysis only concerns 'cryptocurrency' and does not extend to security tokens nor to

[9] *Ibid.*
[10] *Ibid.*

utility tokens. Throughout this thesis, reference is made to 'cryptoassets' when discussed broadly in terms of the overall technology. However, when specific reference is made to its exchange functionality, the term 'cryptocurrency' is used. The difference between both terms is that although 'cryptocurrencies' are a type of cryptoasset, not all cryptoassets function as a medium of exchange, i.e., as currency. Admittedly, this taxonomy is not necessarily neat, as some cryptoasset tokens can be used at cross-purposes. For instance, Bitcoin can be used as a payment instrument to facilitate exchange of value for goods or services, as it can be used as a security tradable on a typical stock exchange.

Exchange Tokens utilise the DLT platform and function as a decentralised tool to enable the buying and selling of goods and services, or to facilitate "regulated payment services." Fundamentally, though, exchange tokens or cryptocurrencies constitutes a type of digital money that, unlike others, are not issued by a central bank, credit institution or e-money institution and can be used as an alternative to traditional fiat currencies.[11] They have emerged as a unique type of digital money that utilises cryptography and complicated mathematical algorithms to create secure monetary assets.[12] Ever since it first appeared on the payments scene, cryptocurrencies have risen in popularity. They have become exchangeable with traditional currencies,[13] earned a reputation as an online payment medium and introduced the idea of decentralisation into payments processing.[14]

Debates around cryptocurrencies however present one underlying problem. They rekindle historical tensions over whether control of the payments system, including how technological change is delivered and controlled, should be at the state's command or directed by the private sector.[15] In recent years it has become reasonable to expect that

[11] ECB, 'Virtual currency schemes – A Further Analysis' (2015) available at <https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemesen.pdf> accessed 15 March 2016

[12] Mikolajewicz-Woźniak, A., and Scheibe, A., 'Virtual Currency Schemes – The Future of Financial Services' (2015) 17(4), *Foresight,* pp. 365-377

[13] Cryptoasset Taskforce, *Op. Cit.,* 8

[14] Blockchain is a technology which performs a simple task of decentralising the trust and authentication of transactions. We trust fiat currency because the issuer, usually the central bank, authenticates it, whether that is money in physical form as banknotes or in an electronic form as a balance held in a bank account. A distributed ledger is a way to replace these centralised trust and authority systems with a decentralised collection of data that is verified by members of a peer-to-peer network.

[15] England, C., 'Is Privately-Provided Electronic Money Next?' (2002), 20(2), *Economic Affairs,* pp. 1,21

drivers of the payments system – governments, central banks and systemically important financial institutions (SIFI) – will continue to have a profound role in the design and delivery of change to payment trends. However, after the 2007/08 global financial crisis (GFC), government involvement in payments have been thrown into a crisis of legitimacy.[16] Although different forms of private money have always existed alongside government-issued currencies, shortcomings of the state-run payments system periodically leads to increased calls for reforms to existing payments system, particularly in relation to state monopoly over the issuance of money.[17]

By enabling the direct transfer of 'monetary units' between network participants without the intervention of traditional payment intermediaries like commercial banks or payments service institutions (PSIs),[18] cryptocurrencies present an alternative vision of how online payments system should be operated. They propose a system where online payments are peer-to-peer (P2P), undermining the state-franchise system and eliminating the role of so-called 'trusted' third-parties. The implication is that online payments effectively become disintermediated in the same way cash payments are.[19] In effect, the cryptocurrency protocol supposedly solves the internet problem of privacy, security and inclusion by eliminating the role of third-party intermediaries in providing trust. Discussions on trust will be undertaken in subsequent chapters, but for the purpose of this introductory section, cryptocurrency "enables the manufacture of trust through clever code" and make it possible to enter trusted transactions directly between two or more persons, authenticated by mass collaborations and powered by collective self-interests, rather than by large corporations motivated by profit.[20]

Furthermore, cryptocurrency's unique features have particularly become attractive to those concerned with the inability of governments and financial institutions to open up

[16] Weber, B., 'Bitcoin and the Legitimacy Crisis of Money' (2016), 40, *Cambridge J. Econ,* pp. 17-41
[17] Hodgson, G., *Conceptualizing Capitalism: Institutions, Evolution, Future* (Chicago Press 2015) 1
[18] Trust is an essential component of all payment transactions, particularly those conducted online. In most such transactions where parties have no prior dealing with each other, trusted intermediaries supply trust by guaranteeing payments by verifying availability of funds and avoiding the 'double spend' problem. See Tsiakis Theodosios. and Sthephanides George, 'The Concept of Security and Trust In Electronic Payments', (2005) 24, *Computer and Security,* pp. 10-15
[19] Swan, M., *Blockchain: Blueprint For a New Economy,* (California, O'Reilly 2015) 34
[20] Tapscott, D., and Tapscott A., *Blockchain Revolution* (Penguin 2016) 4

payment systems for increased participation, offer protections to consumers from privacy related breaches by profit maximisation interests of traditional third-party financial institutions. In addition to allowing people to transfer valued assets without the need for 'trusted' third-parties, cryptocurrencies supposedly enables those who have no access to banks to participate in payments and finance.

By introducing a privately-driven alternative payments processing system with the potential to replace or challenge existing banking systems,[21] cryptocurrencies have attracted government scrutiny because of supposed threats to undermine government control over monetary policy.[22] Furthermore, market speculation,[23] which often leads to high volatility,[24] poses additional problems for its user and the payments system.[25] Although in its early days, the exchangeability of cryptocurrencies against traditional currencies has been in constant flux since it first emerged. For instance, the first recorded payment transaction facilitated with a cryptoasset occurred in 2010 and involved the purchase of two boxes of pizza for 10,000 units of Bitcoins (BTC).[26] However, as of April 2016 Bitcoin exchanged for just over three hundred Pound Sterling per token.[27] As of February 2020, one unit of BTC was worth over seven thousand Pound Sterling.[28]

Notwithstanding the challenges outlined above, proponents of cryptocurrency continue to argue that they offer wider social and economic benefits.[29] For instance, by

[21] Bank of England, *Op. Cit., 7*
[22] Cook, J.,. 'Bitcoins: Technological Innovations or Emerging Threat?' (2014) 30, *J. Marshall J. Info. Tech. & Privacy L.,* 535-570
[23] Tuck, C., and Fry, J., 'Speculative bubbles in Bitcoin Markets? An Empirical Investigation Into The Fundamental Value of Bitcoins', (2015) Vol. 130, *Economic Letters,* pp. 32-36
[24] Bollen, J.,'A discussion of Best Practices in the Regulation of Payment Services: Part 1' (2010) 25(8), *J.I.B.L.R*. 370, 72
[25] Douglas, J., 'New Wine Into Old Bottles: Fintech Meets the Bank Regulatory World' (2016) 20, *N. C. Banking Institute,* pp. 17-65
[26] The Bitcoin Pizza Purchase That's Worth $7 Million Today (2013), available at <http://www.forbes.com/sites/ericmack/2013/12/23/the-bitcoin-pizza-purchase-thats-worth-7-million-today/#7db052af6449> accessed December 24 2016
[27] 'Could Bitcoin Change The Game In Africa?' (2016) *The Guardian.* Available at <https://www.theguardian.com/world/2016/aug/03/could-bitcoin-change-the-game-in-africa> accessed 21 August 2016
[28] Available at <https://www.coinbase.com/price/bitcoin
[29] EBA, 'Opinion on Virtual Currencies', (2014). Available at <https://www.eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf> accessed 12 March 2015

disintermediating payments, cryptocurrencies is said to remove the high transactional costs often associated with third-party servicing; increase participation into the payments sector to the unbanked and underbanked thereby fostering financial inclusion; potentially reduce inflation by eliminating government manipulation of financial markets;[30] and improve the overall efficiency of payments.[31] Furthermore, given the increase of surveillance following incidents of terrorism, coupled with regulatory trends towards 'cashless-society, the anonymity and security of cryptocurrencies arguably offer better privacy protection for online payment transactions.

There is growing debate as to whether cryptocurrencies will require any legal or regulatory response, or whether they fit into existing frameworks. To weigh in on this debate, it is arguably important to examine any legal and economic issues thrown up by cryptocurrencies. It however does appear that many monetary policymakers are faced with the dilemma of finding an appropriate and consistent regulatory balance which, on one hand, safeguards public interests[32] while, on the other, fosters benefits entrenched within this emerging cryptocurrency technology, if any.[33] This task has proven particularly challenging, not least because issues posed by cryptocurrencies sit on the intersection between finance and technology, therefore throwing up novel issues bordering on technological change.[34]

The indication from the academic literature on cryptocurrencies in the UK indicate that, despite its meteoric rise in facilitating online payments, they remain statutorily

[30] Ametrano, F.,, 'Hayek Money: The Cryptocurrency Price Stability Solution, (2014). Available at <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2425270> accessed 28 December 2016

[31] Tapscott D., 'Don Tapscott: How the blockchain is changing money and business', (June 2016). Video File Retrieved from <https://www.ted.com/talks/don_tapscott_how_the_blockchain_is_changing_money_and_businessccessed 16 August 2016]

[32] Greebel E.,, *et. al.,* 'Recent key Bitcoin and Virtual Currency Regulatory and Law Enforcement Developments' (2015), 16(1), *Journal of Investment Compliance,* pp. 13-18

[33] Broadbent, B., 'Central Banks and digital currencies' (2016) Available at <http://www.bankofengland.co.uk/publications/Pages/speeches/2016/886.aspx> accessed on 24 March 2016

[34] Alstyne, M., 'Economic and business dimensions: Why Bitcoin has value' (2014) 57(5), *Commun. ACM,* pp. 30-32

unrecognised as money under English Law.[35] As at the time of writing this thesis, there is no statutory instrument which holistically and directly addresses cryptocurrencies in the UK.[36] This ensuing legal vacuum means that, subject to a thorough analysis, existing legal rules dealing with digital payments may be potentially inapplicable.[37] It also means that bank-related regulation and common law rules such as those on deposit-insurance or monitoring of the illicit global flow of money may also be inapplicable.

The consequence of such legal vacuum are dire, both for persons and entities operating within this emerging cryptocurrency ecosystem, including digital-wallet-service providers. Legal vacuum will invariably leave users and sector participants with little or no legal certainty or guidance. An absence of direct legislation also potentially leaves cryptocurrency payments mainly outside the payments system. It is particularly unclear whether existing payment rules, both in statute and common-law, can be adapted to address the emerging issues of cryptocurrency payments, especially regardless of whether these digital assets fulfil a 'community currency' role on the internet. It is also unclear how the legal consequences of payment transactions undertaken with cryptocurrency should be approached in law. In the absence of appropriate governance frameworks, involvement in this space has not slowed as an entire ecosystem of corporate entities and services have resultantly emerged, most of which expose users and consumers to risks of fraud, theft, extortion and cybercrimes.[38]

Globally, different regulatory approaches are being proposed to tackle the issues of cryptoassets. Some countries have favoured outright bans on cryptocurrencies.[39] Yet, others have opted for fragmented governance approaches to bring some aspects of

[35] Neoclassical economic theories of money acknowledge anything to be money which serve three functions – as a medium of exchange, unit of account, and store of value. Cryptocurrencies have been proven to serve all three functions and are resultantly recognized as money notwithstanding its electronic and intangible form. See Lawrence, W., 'The Market For Cryptocurrencies', (2015) 35, *Cato J.,* pp. 383-402

[36] Girasa, R., *Regulation of Cryptocurrencies and Blockchain Technology,* (Palgrave 2018) 152

[37] Law Library of Congress, 'Regulation of Bitcoin in Selected Jurisdictions', (2014). Available at http://www.loc.gov/law/help/bitcoin-survey/regulation-of-bitcoin.pdf [Accessed 24 December 2016]

[38] Middlebrook, T., and Hughes, J., 'Regulating Cryptocurrencies in the United States: Current issues and future direction', (2014) Vol. 40, *Wm. Mitchell L. Rev.,* pp. 813-848

[39] 'Top 10 Countries in which Bitcoin is Banned'. Available at https://www.cryptocoinsnews.com/top-10-countries-bitcoin-banned/> accessed 18 January 2019.

cryptocurrency within the purview of law. For instance, Japan[40] and Finland[41] specifically deal with crypto-assets as a "commodity" for securities and investments purposes but do not provide legal cover for cryptocurrencies' exchange operations. In the US[42] and the UK,[43] government agencies provide frameworks for taxing incomes from cryptocurrency dealings. The almost sporadic 'knee-jerk' global approach to regulating cryptocurrencies has not helped in providing a coherent global and domestic governance framework, thereby having adverse implications further development of the technology.

In light of the tensions between contending ideologies for economic control, it is important to investigate the adaptability of existing legal tools; to explain how the instrumentality of law should be directed, and what objectives must shape the design-choices of such legal instruments.

1.1.3 Study Objectives: Research Agenda

This thesis examines the viability of cryptocurrencies under existing law as an emerging representation of money. Broadly, the thesis contributes to existing literature on the necessity for regulating this emerging technology; and what form such regulation should take, if at all necessary. The thesis specifically analyses the suitability of existing statutory, regulatory and common law rules on digital payments in relation to any emerging issues arising from cryptoasset payments. In this context, the thesis attempts to answer five key questions:

1. What is money in law and do cryptocurrencies fall within orthodox conceptual framing?

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[40] 'Japan reckons with bitcoin', (17 March 2016), *Nikkei: Asian Review*, available at <http://asia.nikkei.com/Politics-Economy/Economy/Japan-reckons-with-bitcoin> accessed 29 December 2016.

[41] 'Bitcoin judged commodity in Finland after failing money test', (20 January 2014), *Bloomberg*. available at <https://www.bloomberg.com/news/articles/2014-01-19/bitcoin-becomes-commodity-in-finland-after-failing-currency-test> accessed 29 December 2016.

[42] 'IRS Virtual Currency Guidance: Virtual Currency is treated as property for U.S Federal Tax Purposes: General Rules for Property Transactions Apply' (25 March 2014), available at <https://www.irs.gov/uac/newsroom/irs-virtual-currency-guidance> accessed 29 December 2016.

[43] HMRC, 'Cryptoassets: Tax for Individuals' (December 2019) available at <https://www.gov.uk/government/publications/tax-on-cryptoassets/cryptoassets-for-individuals> accessed 21 January 2020.

2. Whether legal and regulatory frameworks adequately respond to the unique cross-sectional concerns raised by cryptocurrencies?
3. What is the role of law in relation to possible adoption of cryptocurrencies into the mainstream payments sector?
4. What changing payment trends are evidenced by regulatory developments, and what solutions do cryptocurrencies offer?
5. Whether potential reforms to address any barriers, gaps or inconsistencies in the existing legal frameworks governing cryptocurrencies may be introduced?

This thesis explores some of the complexities, challenges, dynamics and uncertainties in the governance of cryptocurrency technology. The broad aim is to examine the extent to which the English legal framework on online payments services are adaptable in addressing issues posed; and to contribute to the understanding of cryptocurrency regulation. The thesis adopts the taxonomy of cryptoassets developed by the UK Cryptoasset Taskforce, highlighted above.

Within this scope, the thesis explores the conceptual framework of 'money' and 'payments' under English law and analyses whether these frameworks provide an adequate basis for understanding cryptocurrencies. The central hypothesis of this thesis is that the complicated relationship between law, finance and economic power have produced a series of understandings and theoretical perspectives which shape how the law responds to technological innovations in finance. To examine this general hypothesis, the thesis critically analyses relevant provisions of the Payments Services Regulation (PSR),[44] Electronic Money Regulation (EMD)[45] and Common Law rules which set out principles on payments.

The analysis assesses the adequacy of existing legal tools in providing a workable governance framework to promote the benefits of cryptocurrencies while also protecting consumers from its 'bleeding' edges. The thesis acknowledges that concerns of potential

[44] Payment Services Regulations 2012, No. 1791.
[45] Electronic Money Regulations 2011, SN 2011.

disruption to traditional payment systems and rules are legitimate but introduces a less orthodox approach to debates on the regulation of cryptocurrencies in the UK. The thesis highlights advantages of crypto-payments over concerns emerging from recent trends in payment services, particularly the infringement of privacy resulting from surveillance of electronic payments, and financial exclusion occasioned by monetary policy promoting the shift towards a cashless society. Furthermore, the thesis articulates risks of cryptocurrency payments and argues for the reconstruction of legal categories, concepts and financial regulatory objectives to adequately address the emerging risks underscored by the increasing digitisation of payments.

The rationale for choosing to focus on English law, amid the cross-national nature of cryptoassets, is informed by two main factors. Firstly, there is yet no direct legal response to cryptoassets under English Law. Additionally, despite its increasing popularity, the Bank of England is considering the possibility of issuing a Central Bank Digital Currency (CBDC) to serve as a "universally accessible and interest-bearing central bank liability, implemented via distributed ledgers to compete with bank deposits as a medium of exchange."[46] This direct interventionist approach by the government is particularly interesting and provides scope to analyse broader socio-economic questions concerning who should control finance and payments. Secondly, within the context of international commercial law, English law is still generally regarded as the law of choice in international commercial contracts.[47] In such contexts, one can expect that parties to cryptocurrency payment transactions of parties based in England or Wales will not take the risk of not including a choice of law clause and potentially having their commercial contracts governed by the law of the residence. The reasons are not far-fetched. London

[46] Bank of England, 'Digital Currencies'. Available at https://www.bankofengland.co.uk/working-paper/2018/central-bank-digital-currencies---design-principles-and-balance-sheet-implications > accessed 12 December 2016

[47] Bradgate, R., *Commercial Law* (3rd edn, OUP 2005) para 1.4. The Law Society of England and Wales has even prepared a booklet for foreign businesses emphasizing the benefits of choosing English law for their commercial contracts. English law has therefore become an "export product" in international trade. See: The Law Society of England and Wales, England and Wales: The jurisdiction of choice, available at: http://www.lawsociety.org.uk/documents/downloads/jurisdiction_of_choice_brochure.pdf> accessed 9 March 2020

has a firmly established position as a world-leading financial centre,[48] and English courts have historically laid down rules which have had a wide-reaching impact on many legal jurisdictions. Furthermore, the internationalisation of financial markets has particularly concentrated governance of international finance in certain centres, such as the London, New York and Shanghai.[49] Resultantly, English law has a unique position in being able to drive bold global changes to legal concepts and consumer protection initiatives which fall within the scope of this thesis. [50]

1.2 METHODOLOGY AND THEORETICAL FRAMEWORK

1.2.1 Methodology

This thesis is based on the doctrinal analysis of primary and secondary sources. The starting point is the analysis of principles and norms which shape the legal framework for digital payments under English Law. The sources of data for this research are literature on economic thought, policy papers issued by the Bank of England, Financial Conducts Authority, European Central Bank and UK's Cryptoassets Taskforce[51] juxtaposed with existing statutory and judicial pronouncements.[52] The thesis uses data collected to provide a critical discussion on the relationship between the functionality of cryptocurrencies and the existing normative rules underpinning payments regulation. The thesis is analytical and interdisciplinary. It engages with conclusions of the vast literature on the topic of cryptocurrency regulation in law, economics and technology. The thesis combines doctrinal analysis and critical legal review to achieve the research objectives and provides a holistic understanding to shape the legal response to crypto-payments. The scope of the thesis is restricted to cryptoassets' exchange utility.

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[48] Wallace, T., 'Rule Britannia: London Overtakes New York as the World's Best financial Centre' T*he Telegraph,* available at <https://www.telegraph.co.uk/finance/newsbysector/banksandfinance/11884783/Rule-Britannia-London-overtakes-New-York-as-the-worlds-best-financial-centre.html> accessed 21 December 2019.

[49] Picciotto, S., and Haines, J., 'Regulating Global Financial Markets' (1999) 26(3), *J. Law Soc.,* pp. 351-368

[50] Hadfield, G., 'The Levers Of Legal Design: Institutional Determinants Of The Quality Of Law', (2008), 36, *J. Comp. Econ.,* pp. 48-73

[51] The Cryptoassets Taskforce is a joint HM Treasury, FCA and BoE effort to set out the UK's approach to cryptoassets and DLTs in financial services.

[52] Watkins, D., and Burton, M., (*ed), Research Methods in Law,* (London: Routledge, 2013) 15

Furthermore, the thesis also takes an interdisciplinary approach by considering literature from other academic disciplines, particularly economics, computer science and finance. This approach is necessary in order to address the research questions which are not exclusively about law, but extend to, for instance, regulatory theories, technological innovation, economic theories etc. In understanding the intersection between law, finance and technology, adopting such an interdisciplinary methodological approach uniquely provide this thesis with tools that provide a more informed and balanced insight into the issues around regulating an innovative technology such as cryptocurrency regulation.[53] Admittedly, to set the foundations of a legal framework, there is a need to engage doctrinally with law. However, to adequately address and contribute to arguments on regulatory theory or technological innovation, it is essential to use interdisciplinary literature.

1.2.2 Theoretical Framework

This thesis critically evaluates theoretical explanations for the operation of law and its inadequate response to privately driven technological innovations into payments. The legal theory of finance (LTF) asserts that finance is legally 'constructed' to provide continuous legal vindication for evolving financial devices developed to solve, among others, fundamental uncertainty within finance.[54] LTF presupposes that, by design, legal instruments operate to justify financial instruments, supplying legitimacy to emerging financial tools and stimulating regulatory multiplicity by assigning rulemaking to different stakeholders. However, the full force of legal and contractual commitments often tend to be suspended for the benefit of those at the apex of the financial system in times of direct tension. It is here that power becomes significant in determining how legal rules should apply.

This thesis critically examines existing legal framework on payments to tests theoretical assumptions within LTF: analysing whether legal responses to cryptoasset payment

[53] Mathias, S., 'The Taxonomy of Interdisciplinary Legal Research: Finding the Way Out of the Desert' (2009) 7(1), *Journal of Commonwealth Law and Legal Education,* pp. 5-17
[54] Pistor, K., 'A Legal Theory of Finance', (2013), Vol. 41, *J. Comp. Econ,* pp. 315-330

technology are illustrative of the power struggles between interest-groups on how the instrumentality of law should address issues thrown up by crypto-innovation. This thesis makes an empirical observation on the implicit power-plays in respect of cryptocurrency regulation, while also critiquing predominant regulatory approaches to outline their respective strengths and weaknesses.

1.2.3 Positionality

In qualitative researches such as undertaken in this thesis, questions of positionality as between the 'researcher self' and 'research' are becoming ever more important, especially given that all qualitative research is contextual.[55] Positionality requires the researcher to place their 'self' in the research process and, while highlighting the structured, layered and ideological nature of the research context itself, to make it clear who the researcher is. This positionality "is not necessarily fixed in some absolute sense but may translocate through categories and identities."[56]

Positionality, often used interchangeably with 'reflexivity' referring to how research outcomes can be shaped by research processes, has its advantages. For the most part, this "self-referential characteristic of 'bending-back' some thought upon the self"[57] aids in focusing attention on theoretical assumptions and pre-understandings.[58] Furthermore, reflexivity empowers the researcher to reach research outcomes with full understanding and acknowledgement of their own biases within the context of their research. Escaping the subject-object divide implicit within research processes via reflexivity also aids in recognising the negotiated nature of the researcher, research context and the researched. Only upon this does meaningful dialogue between researcher, context and research objective develop.

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[55] Dodgson, J., 'Reflexivity in Qualitative Research' (2019), Vol 23(2), *Journal of Human Lactation,* pp. 220-222

[56] Andrew, H., 'Reflections on Interviewing Foreign Elites: Praxis Positionality, Validity, and the Cult of the Insider' (1999), Vol. 30, *Geoforum,* pp. 313-327

[57] Hibbert, P., Coupland, C. and MacIntosh, R., 'Reflexivity: Recursion and Relationality in Organizational Research Processes' (2010) Vol. 5(1), *An International Journal,* pp. 47-62

[58] Alvesson, M., and Sköldberg, K., *Reflexive Mythology: New Vistas for Qualitative Research* (2nd edn, London: Sage) 13

It is therefore important to attempt an outline of how the author's background, worldview, identity, experiences, values and biases may shape or impact upon the outcome of this study. As a Nigerian with significant legal experience in commercial corporate practice and long-standing interests in the politics of technology, this study of legal and regulatory response to cryptocurrency in English law is approached from the perspective of an outsider looking in.

For context, Nigeria is a large country accounting for about half of West Africa's population with approximately 202 million people with one of the largest youth populations in the world.[59] Despite its enormous population, Nigeria's complex political set up struggles to manage its over 350 ethnic groups, which speak as many languages, most of which are not mutually understandable. The undeniable implication of ineffective political and economic governance is massive corruption in the public and private sectors.[60] In finance, inefficient governance systems, among other factors, have closed off participation to significant portions of the population. In a 2013 study, the Central Bank of Nigeria observed that "financial exclusion has manifested prominently in Nigeria with the bulk of the money in the economy staying outside the banking system."[61] Erosion of confidence in the banking sector, aggravated by chaotic political events in 70s and 80s, have left the ratio of currency outside the banking system to about 40.9 per cent.

The lack of trust in public systems and financial exclusion mean that there is a favourable disposition to outsider solutions such as those provided by non-state actors. This is more so the case given recent instances where political office holders abuse their enormous powers, enabled by state institutions. For example, following recent protests by Nigerian youths against police brutality, the Central Bank of Nigeria is reported to have barred private initiatives from raising funds in support of protests. Most prominently, the CBN accused financial technology (fintech) companies of funding terrorists with the donation

[59] World Bank Data available at https://www.worldbank.org/en/country/nigeria/overview accessed 12 November 2020

[60] Okonjo-Iweala, N., *Fighting Corruption is Dangerous* (Cambridge, MIT Press 2018) xvii

[61] The Central Bank of Nigeria, "Financial Inclusion in Nigeria: Issues and Challenges" (2013) available at <https://www.cbn.gov.ng/out/2014/rsd/occasional%20paper%20no.%2045%20issues%20and%20challenges.pdf> accessed 12 November 2020

accounts setup to support protesters.[62] Activists resorted to cryptocurrencies and amassed roughly 3.14 units of Bitcoin worth over $36,000.[63] Of course, the argument can be made that cryptocurrency became a tool in Nigeria's fight for civil rights. It is acknowledged that cryptocurrencies are not without problems, and to argue otherwise would be inconceivable. However, approaching the issue of its adoption and potential legal approval from the viewpoint of a weak financial system is a bias the author is willing to acknowledge, albeit with the risk that objectivity of critical analysis undertaken in this research could be compromised.

Admittedly, this study will be seen through the author's particular epistemological lens and lived experiences of failed public governance systems, financial exclusion, untrustworthy public institutions, global capitalism, colonialism and, to some extent, the limitations of law. These epistemological lenses will undoubtedly feature prominently within discussions on failure of state-run systems, regulation and monetary operation. To some extent, analyses undertaken in places will seemingly focus on and identify problems peculiar to developing economies. This will be important in providing contextual discourse in relation to potential role of cryptocurrency in addressing such problems. In my view, these discussions will contextualise any research findings and recommendations made later on. Importantly, contextual discussions will negate the growing consensus that in the production of knowledge, the positionality of African scholars, even in studies that focus on African issues, is severely marginalised despite the importance of knowledge possessed about their societies.[64]

[62] Business Insider Africa, "#EndSARS: Flutterwave denies reports alleging it was summoned by CBN for funding terrorists" <https://africa.businessinsider.com/local/markets/endsars-flutterwave-denies-reports-alleging-it-was-summoned-by-cbn-for-funding/t4jq4zj> accessed 12 November 2020

[63] Coindesk, "Nigerian Banks Shut Them Out, so These Activists are Using Bitcoin to Battle Police Brutality" published 16 October 2020. Available at < https://www.coindesk.com/nigerian-activists-bitcoin-endsars-police-brutality> accessed 12 November 2020

[64] Mwambari, D., 'Local Positionality in the Production of Knowledge in Northern Uganda' (2019) Vol. 18, *International Journal of Qualitative Methods,* pp.1609406919864845.

1.3 STRUCTURE

The first substantive chapter of this thesis, Chapter II, briefly introduces virtual currency schemes and strives to answer whether they constitute money. The chapter adopts a dual approach to this question: it traces the historical and theoretical underpinnings of money and payments. The chapter sets out how cryptoassets will be treated throughout the thesis and sets the scene by contextualising the arguments made later in the thesis, i.e., providing some reasoning for the treatment of cryptoasset *exchange tokens* as a legitimate payment instrument and conceptually as money. To be categorised as money, any medium including cryptoassets must fulfil three conditions – it must be able to function as a medium of exchange, a store of value, and a unit of account.[65] The theoretical and historical work undertaken in this chapter provides the public and economic reasons for this. The analysis identifies links between theorisation of money and influence of the state in creating a hierarchy of money. Although the conceptual and functional attributes of money have consistently evolved over the years, normative legal rules which underpin them remain static. This chapter thus demonstrates the extent to which legal understanding of money and payments are archaic and rooted in physical assets. The chapter ultimately argues that despite the changing role and digitisation of money, governments' enormous powers to determine acceptability of money suggests the importance of political and economic power in shaping legal theory or response.[66] The chapter, therefore, provides a framework for categorising cryptoassets within the hierarchy of money.

Having built on a conceptual framework of money, Chapter III critically analyses the nature of financial regulation, identifying normative values which underpin regulatory choices and design. Given the incursion of technology, financial services are experiencing a period of unprecedented innovation where exciting new solutions, such as those proposed by cryptoassets, are being developed to combat age-old payment difficulties. As currently constituted, the underlying objective of redistributing rights for public interests shapes financial regulation. The GFC has demonstrated that regulation is not designed and implemented in a vacuum. Instead, special interests influence the content and design of

[65] Hollander, J.,, 'The Development of The Theory of Money From Adam Smith to David Ricardo' (1911), 25(3), *Q. J. Econ.,* pp. 433

[66] Bell, S., 'The Role of the State and the Hierarchy of Money' (2001), 25, *Camb. J Econ.,* pp. 149 - 163

regulatory tools. I thus argue in this chapter that the 'public interest' approach to financial regulation is manifestly flawed and conceals the true nature of 'so-called' public interests. By providing a robust critique of 'public-interest' motive, this chapter demonstrates the subtle triumph of special interests in the guise of pursuing normative economic aims. In this chapter, I critically analyse whether financial regulation strikes an appropriate balance between normative economic aims while also addressing new concerns thrown up by innovation. To effectively provide a governance framework for cryptoassets, a few new factors must become integral considerations in designing regulatory tools and responses, particularly consumer protection, fostering innovation and preservation of promotion of choice.

Chapter IV is divided into two sections. The first section identifies and discusses the crucial components of cryptoassets exchange tokens. It holistically examines how they function as a mediums of exchange and how payments are processed using the underlying distributed ledger technology – blockchain. The chapter also describes and discusses the burgeoning global cryptoasset market and its key constituents, including crypto-exchanges, wallets, payments service providers and mining. The chapter identifies why DLT presents such a challenge to the existing payments systems. The second section critically analyses the legal issues posed by cryptoasset technology; critically analysing benefits and problems. Ultimately, the chapter identifies highlights the specific areas and issues which require a governance framework.

Chapter V conducts an external critique of the current legal framework for payments, particularly relevant provisions of the Payments Services Regulation,[67] Electronic Money Regulation[68] and Common Law rules. The chapter analyses the extent to which this existing legal framework for payments provides adequate legal solutions to problems highlighted in Chapter IV. The analysis provides a test of the hypothesis and theoretical assumptions under LTF regarding the role of law in advancing interests of those at the

[67] Payment Services Regulation 2012, No. 1791.
[68] Electronic Money Regulations 2011, SN 2011

apex of the payments hierarchy. It observes how existing legal rules governing payments interacts with the technical nature of cryptoassets.

Chapter VI lays the building blocks of a new crypto-governance model. It delves into the different regulatory proposals and evaluates their relative strengths and weaknesses. Importantly, this chapter assesses claims that cryptoasset payments provide a viable and alternative vision to existing state-control models of finance, particularly the benefits of this new model in light of the problems posed by regulatory trends. This chapter thus highlights areas of tension between private libertarian interests and public safety interests of existing regulatory approaches. The chapter argues that existing regulatory proposals do not provide a comprehensive response to the issues identified earlier, particularly the benefits and challenges of cryptoasset payments. Furthermore, the construction of an appropriate governance framework will have to incorporate the regulatory objectives identified in Chapter III, especially in relation to creating incentives which foster continued innovation, removing threats to public safety and preserving personal liberties.

In conclusion, this thesis analyses the key issues emerging from the entire study, particularly the gaps which cryptoassets fill in this informational age in relation to the preservation of privacy and promotion of payment choices in an emerging cashless society. The conclusion chapter also proposes a range of alternative conceptual and regulatory approaches which arguably provide a better governance framework for harnessing the value of cryptoasset payments. While not advocating for a complete ban on cryptoassets, the thesis performs an analysis of its recommendation, identifying strengths and weaknesses.

CHAPTER II

HISTORICAL AND THEORETICAL UNDERPINNINGS OF MONEY AND FINANCIAL INNOVATION

Much of the debate on what constitutes money in law is rather sterile and has few implications for the rights of parties to commercial transactions, where payment by bank transfer is the almost universal method of settlement. In most developed countries, where bank failures were until recently infrequent, a bank's unconditional commitment to pay is treated as the equivalent of cash. The crucial question, then, is not what constitutes money but what constitutes payment.[1]

2.1 INTRODUCTION

Money is central to most, if not all, modern economic systems. Alongside the use of money, payments and payment services have been a feature of economic thought from ancient times.[2] Although its existence spans back many centuries, it remains an extremely complex and "mysterious"[3] institution. The literature on money is vast and contentious not least because, as an idea, it has taken on a variety of forms over the years.[4] Evidently, money has been on a steady journey of 'modernisation' from ancient to present times, with historians suggesting the existence of different forms of 'money' such as seashells, cowries and metals.[5]

Notwithstanding this fact, the aim of this chapter is not necessarily to add to the vast literature on money but rather, to reflect on lessons from money's complex theoretical history. This chapter engages with the idea that emerging ways of exchanging value through cryptocurrency, itself a mirror of the typical function of money, may or may not represent a new frontier in the continuing evolution of money. This is significant because, as revolutionary, cryptocurrency would require the deconstruction of monetary theory.

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[1] McKendrick, E., (ed), *Goode on Commercial Law* (4th edn, Penguin 2010) 488.
[2] Bollen, R., *The Law and Regulation of Payment Services* (Kluwer Law International 2010) 5
[3] Hodgson, G., *Conceptualizing Capitalism: Institutions, Evolution, Future,* (2015 Chicago Press) 147
[4] *Ibid.*
[5] Einzig, P., *Primitive Money in its Ethnological, Historic and Economic Aspects* (2nd edn, Pergamon 1966) 552

However, such deconstruction will be unnecessary where cryptocurrency merely represents a new chapter in the continuing story of money. The outcome would determine the extent to which orthodox conceptual understanding of money is amenable to accommodate emerging technology of cryptocurrency. To untangle this idea, it will first be important to examine the origins of money, contending theoretical accounts and how money works in today's financial system.

This chapter sets the scene of the thesis by presenting an analysis of the money's theoretical framework and providing an overview of the controversies concerning its nature, origins and governance. More specifically, the primary aims in critically evaluating contending theoretical frameworks of money is to observe significant conceptual changes that have occurred since the beginning of economic thinking and to underline some key lessons. Outlining these changes will provide a useful framework for understanding current events, especially in relation to payment technologies. It will also provide some theoretical tools necessary for identifying novel issues and designing adequate legal responses to such issues.

The chapter is divided into three sections. First, it critically traces and evaluates monetary theory, pinpointing the non-static nature of conceptual understanding. The second section outlines the general nature of 'digital money' with an aim of examining whether new digital forms of value exchange fit into orthodox conceptual understanding of money. The last section draws the links between 'digital money' and cryptocurrency. It answers the question, if 'digital money' is acceptable as money in discharging payment obligations and therefore consistent with contemporary understanding of money, should cryptocurrency be equally regarded as money?

In recent times, the advent of information technology has induced the development of diverse forms of digital payments, particularly for transactions over the internet. Furthermore, the widespread use of mobile technologies and electronic commerce has also increased the popularity and widespread use of digital payments. Notwithstanding increasing popularity, technological advances pose a vast number of practical and legal

challenges, particularly as it concerns the legal understanding of money and payments; and the operational expectations from payment processes.[6]

SECTION I

2.2 UNDERSTANDING MONEY

Despite lasting more than two thousand years, the controversy concerning the nature of money remains unsettled, which *Von Mises* described as a question of terminology whose aim is simply to facilitate further investigation.[7] There are different competing theories for how money may have originated. Some theories are based on assumptions regarding a 'so-called' historical origin of money. Others seek to explain the nature of money by consideration other related concepts such as "value" or "legality" as underpinned by issuance. To my mind, the acceptability of each theory seems to depend on whether its explanations are consistent with contemporary realities of the modern global monetary system. This is an acceptable test. However, just explaining contemporary realities may supposedly serve an insufficient standard of acceptability, especially given the rapid changes to payments occasioned by innovative technologies. Afterall, money was once mainly associated with tangible tokens such as currency notes or coins (otherwise called *fiat* money). However, evidence increasingly suggests that money is becoming more intangible. In the UK, for instance, over 97 per cent of money in circulation exists intangibly in electronic ledgers held by backs.[8] The point made here is that attempts at providing robust theoretical frameworks to explain contemporary realities of money may, if examined closely, merely be describing "payments" and not necessarily "money". That notwithstanding, let us now consider the different theoretical accounts in some detail.

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[6] Cook, J., 'Bitcoins: Technological Innovation or Emerging Threat?' (2015) 30, Marshall J. *Info. Tech. & Privacy L.,* pp. 535

[7] Von Mises, L., *The Theory of Money and Credit* (1st edn 1912, Skyhorse Publishing 2013) ch3, s 1.

[8] McLeay, M., 'Money Creation in The Modern Economy' (2014) Q1, *Bank of England Quarterly Bulletin,* <http://www.monetary.org/wp-content/uploads/2016/03/money-creation-in-the-modern-economy.pdf> Accessed 12 March 2016

2.2.1 What is Money?

Most orthodox accounts agree that money must be perceived through its primary function as an instrument of payments.[9] However, areas of contention often revolve around questions of origin and control. In other words, how it emerged in the marketplace and how who ought to exercise its control.[10] A close examination of major arguments across the entire spectrum of theoretical debates is relevant, particularly in assessing the extent to which emerging unorthodox forms of payment, such as cryptocurrencies, might fit into existing conceptual frameworks. This is more so the case considering that cryptocurrencies are insufficiently unexplored within academic disciplines; and also, quite starkly unlike existing forms of money and.[11] This dissimilarity is particularly underscored by the fact that, other than being used in facilitating online payments, cryptocurrencies are not recognised by many western countries, including in the UK, as traditional money, whatever 'traditional' means.

There are two broad contentions regarding the meaning of money. At one end of the theoretical spectrum are ideas hinged on historical accounts that money emerged naturally from a 'pre-money' barter system in which, without a means of exchange, individuals had to accept types of commodities to trade. At the other end are theories which contend that money emerged from social interactions backed up by the state. The difference between both poles revolve mostly around how money appeared on the scene – one group contending that money emerged from the stables of the state, and the other attributing its emergence and control to market forces. For the purpose of this discussion, I will group these arguments into two categories representing their respective periods of dominance.

2.2.2 Classical Approaches to Money

In his writings on politics, Aristotle was arguably the first to put forward a theory on the origins of money. This theory was re-echoed by Adam Smith in his 1776 book, "The

[9] Schumpeter, J., *A History of Economic Analysis* (Routledge, 1934); Zarlenga, S., 'The Lost Science of Money' (2004), Vol. 16, *European Business Review,* pp. 1; Ingham, G., *The Nature of Money* (2004) pp. 15

[10] Hodgson, G., *Op. Cit., 3,* pp. 1

[11] Feistel, H., 'Cryptography and Computer Privacy' (1973) 228, *Sci. Ameri.,* pp. 15-23

Wealth of Nations."[12] According to this accounts, money spontaneously sprung to existence as a product of exchange barter.[13] These thoughts on the existence of a pre-money barter economy laid the foundations for classical economic thinking, which overwhelmingly featured in most monetary theories throughout the 17th and 18th centuries. Another major recurring feature of classical economic thinking was the 'compartmentalisation' of money as two distinct things: its physical representation as distinct from its more intangible intrinsic component otherwise called '*value'*. The crux of Simmel's argument, for instance, in relation to the distinction between the physical form of money and its intrinsic 'value' is encapsulate thus:

> The significance of money as expressing the relative value of commodities is quite independent of any intrinsic value. Just as it is irrelevant whether a [physical measuring instrument] consists of irons, wood or glass…so the scale that money provides for the determination of values has nothing to do with the nature of its substance.[14]

Recurring discussions on money during this classical era mostly centred around the meaning of this *value.* As will be demonstrated, contending theoretical explanations almost ignored addressing the 'physical representation' aspect of money. Much more effort, by both ends of the theoretical divide at the time, was put into challenging the intrinsic component of money. For instance, while *Marx* argued that *intrinsic value* is the '*abstract labour'* of people, others like *Simmel* advanced arguments suggesting the social determination of intrinsic value.[15] Let us now consider the major classical economic theories.

2.2.2.1 Commodity Theory (Metallism)

Commodity theory argues that money is the physical representation of *'real value'* emanating from the cost of production and crystallised into an efficient exchange commodity. It is argued that the starting point in conceptualising money as "the efficient

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[12] Smith, A., *An Inquiry into the Nature and Causes of the Wealth of Nations,* (OUP 1976) The Glasgow Edition of the Works and Correspondences of Adam Smith. Available at < http://files.libertyfund.org/files/220/0141-02_Bk.pdf> accessed 12 October 2020

[13] Schumpeter, J., *A History of Economic Analysis* (Routledge, 1934)

[14] Frisby, D., (ed), Georg Simmel: *The Philosophy of Money* (3rd edn, Routledge 1990) pp. 278

[15] Ryan-Collins, J., *et al., Where Does Money Come From?* (New Economic Foundation 2012), pp. 40

exchange commodity" is the existence of a pre-money barter system in which, to meet their human needs, individuals resorted to exchanging goods. In other words, without this 'so-called' barter system, direct and indirect exchange of commodities for necessities would have been impossible.[16] However, the barter system had two major problems. Traders had to have something the other party wanted (the double coincidence of wants); and the inefficiencies created as a result of complexities of multi-partied exchanges, especially those transacted over long distances.

The story continues that to solve these inconveniences and inefficiencies, people spontaneously began to accept certain types of commodities (market common commodities) which tended to have two characteristics – acceptability and divisibility. Common commodities had to be acceptable by a majority of people, arguably because most people considered such commodities valuable. Also, market common commodities had to be easily divisible into small units so as to enable payment of varying amounts possible. Although many different commodities may have served this common purpose, it is suggested that valuable metals like gold and silver emerged as the preferred market common commodity because it met both requirements of acceptability and divisibility. However, metals had one problem. They were susceptible to manipulations or diminutions when its metallic contents were adulterated with less valuable metals such as where gold would be smelted down and mixed in with cheaper metals. For this reason, standardisation became essential. Many have suggested this problem gave rise to "coinage", a system where valuable metals were centrally authenticated and standardised.[17] However, money was not represented by valuable metals like gold merely for possessing both features of acceptability and divisibility. As Marx argued, that money takes the shape of coin springs from its function as the circulating medium. But interestingly, the circulation of coins was only made possible because of the influence of the state, on one hand, and desirability of

[16] Hollander, J., 'The Development of The Theory of Money From Adam Smith To David Ricardo' (1911) 25(3), *Q. J. Econ.,* pp. 433

[17] Ingham, G., *The Nature of Money* (UK Polity 2004) 15; Anitra Nelson, *Marx's Concept of Money: The God of Commodities* (Routledge, 1999), pp. 1

gold as a valuable metal. But mostly, it was the state's underling promise to pay, it is argued, that escalated the prevalence of metal circulation.[18]

The central contention was therefore that where any commodity becomes the consensus market commodity due to its divisibility and acceptability, it therefore became 'money' for the primary purpose of facilitating trade. The suggestion here was therefore that money can be "thought of simply as a 'veil' over barter, masking the fact that people are really just exchanging one good or service for another."[19] Also, this theory suggests that money must always invariably take the form of a commodity or be underpinned by one, with its purchasing power determined by the value of the 'consensus' exchange commodity, such as gold. Commodity theorists would therefore had held the view that money spontaneously emerged from self-interested individuals in response to inconveniences and inefficiencies of barter. However, the longevity of any commodity money in serving to oil the wheels of trade depended on reciprocity in usage and market appeal, which itself was guaranteed by actions of central governments.[20]

From this historical foundation, commodity theorists reach two conclusions. First, the determination of the 'real value' of money is ascertainable only in reference to the intrinsic value of the underlying commodity, independent of the control of states actors.[21] Second, money must always be represented by a physical and tangible object, either as a metal of value such as gold and silver or a convertible paper representation of such metals.[22]

Although no longer a popular perception of money, it is difficult to conceptualise what role this theory would assign to electronic forms of money, especially those represented by credit to modern day bank accounts. The best explanation in this regard is perhaps one in which, having emerged much later in the story of money's origin, banks only show up as places where people store their physical coins and eventually lend them to others. But typical commodity theorists of the classical era probably did not envisage the exponential

[18] Marx, K., Capital Vol. 1, available at <https://www.marxists.org/archive/marx/works/1867-c1/ch03.htm#a3> accessed 11 November 2020
[19] Jackson, A., and Dyson, B., *Modernising Money* (London, Positive Money 2012) 32
[20] Dalton, G., 'Barter' (1982) 16(1), *J. Econ. Issues,* pp. 180,181
[21] Hamilton, H., 'The Failure of the Ayr Bank, 1972' (1956) 8(3), *Econ. Hist. Rev.,* pp. 412
[22] John, R., *The Life of Adam Smith* (Macmillan & Co, 1895) 253 - 255

expansion in the creation of money through credit as it normalised in modern day banking systems. Accordingly, credit was often dismissed as having no implication on overall money supply and economic activity. On the effect of this lending activity, John Stuart Mill observed the following:

> It seems strange that there should be any need to point out, that credit being only permission to use the capital of another person, the means of production cannot be increased by it, but only transferred… The same sum cannot be used as capital both by the owner and also by the person to whom it is lent it cannot supply its entire value in wages, tools, and materials, to two sets of labourers at once.[23]

The consensus view perceived banks as mere intermediaries whose activities, including extension of credit, had no real effect on the economy except to transfer resources from a person to another. This view is problematic to understanding the role of commercial banks in creating money, as is prevalent in modern economies. It also does not provide ampul explanation in relation to the powers of the state, except the limited role of guaranteeing circulation. But the more important critique of commodity theory is its reliance on history i.e., the existence of a barter economy.

As indicated above, theoretical understanding of money is built on historical foundations of the barter system. In other words, history and barter are major components of this explanation of money. It only follows that any discussion of the implications of this theory must interrogate the historical evidence. For instance, upon examining ethnographical evidence from western and contemporary primitive history, *Einzig* found evidence of the use of primitive currencies such as the cigarette currency; cloth and gin money in pre-colonial Nigeria; grain medium of exchange in India; use of livestock standards in the Mongolian empire; and tobacco currencies in various other parts of the world.[24] Despite this, his findings showed that though different forms of trade existed thousands of years

[23] Mill, J., (Williams, A., Ed.) *Principles of Political Economy with some of their applications to Social Philosophy* (7th edn: London Longman, 1909)
[24] Einzig P., *Op. Cit., 5,* pp. 520-562

ago, commodity exchanges were too sporadic or infrequent. There was therefore no evidence from the sporadic use of commodities to identify any 'common' mediums.[25]

On the veracity of pre-historic evidence suggesting the existence of a barter system, *Dalton* remarked as follows:

> Another ambiguity obstructing our understanding of barter is due to conjectural history, to spurious evolutionary guessing about what may have plausibly preceded the use of cash (coinage) for market transactions, a hypothetical explanation of the origins of money invented to point up the usefulness of money by showing how difficult it would be to carry out market transactions without money, an explanation that goes back to Aristotle.[26]

It is particularly difficult to corroborate the assertions of commodity theorists about the existence of a pre-historic barter system in the absence of any credible evidence. Many anthropologists and historians have disputed assertions drawn from Adam Smith's The Wealth of Nations thesis. For instance, Graeber, an anthropology professor disputed the idea that money came out of a barter system. Instead, he argued it is barter that emerged from money. He remarked that "in most of the cases we know about, barter takes place between people who are familiar with the use of money, but for one reason or another, did not have a lot of it around."[27] The indication is that the so-called historical evidence of barter are largely unverifiable. For one, to assert the existence of a pre-money society organised around barter is problematic because it would require clear testimonies by merchants of the reasons underpinning their exchange habits and choices. In other words, proof of why merchants exchanged goods is as important as proof that goods were exchanged at all. In such cases, only the merchants involved could provide specific testimony as to why they chose any particular commodity to facilitate a transaction. As such, only such pre-historic merchants who chose specific objects for exchange purposes can attest to their reasons for such choice.[28] Thus, the commodity theory is fundamentally presumptuous.

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[25] Childe, G., 'Primitive Money' (1949) 2(1), *Econ. Hist. Rev.,* pp. 88-89
[26] Dalton, G., *Op. Cit., 20*
[27] Graeber, D., *Debt: The First 5000 Years* (Melvile House 2011) 328
[28] Foley, D., 'On Marx's Theory of Money'(1983), 1(1), *Social Concept*, pp. 20

Judging from the absence of verifiable evidence, *Humphrey* reached the conclusion that "no example of a barter economy, pure and simple, has ever been described, let alone the emergence from it of money."[29] With the centrepiece of commodity theory in doubt, assertions of money's spontaneous emergence without state intervention to resolve barter inconveniences immediately becomes, at best, a "thought experiment."[30] Although useful for identifying the potential causal mechanisms of money, such 'sudden spontaneous emergence' cannot be relied on as an indisputable account of history upon which to base the theoretical understanding of money.

The earliest historical justification for commodity theory stems from evidence of the 'coinage era' in which gold and silver coins were used as money. In this regard, several historical references are often made to, for instance, the *Code of Hammurabi* which stipulated payments in gold coins as punishment or remuneration.[31] Also, recourse is often made to the 17th century French Livre and Scottish money during the reign of Alexander-the-First which is reported to have contained a pound tower weight of silver.[32] In attempt to draw causal links between private market commodities and public minting, commodity theorists often refer to times when coinage was recognisably used. For instance, *Smith* argued that metals only became the consensus commodity fit to be instruments of commerce and circulation because of its durability and divisibility. As such, it was the disparities in quality of privately weighed metals and instances of fraudulent adulteration of metallic components during diminution, which made it necessary for centralised authentication through affixing public stamps of quality. The authentication of coins, *Menger* argued, signposted the beginning of the state's role to "protect the coins and other means of exchange effectively" from counterfeiting or illegal reductions of weight.[33] By that explanation, commodity theorists argue that money's value and relevance is

[29] Humphrey, C., 'Barter and Economic Disintegration' (1985) 20(1), *Man,* pp. 63
[30] Hodgson, G., *Op. Cit., 4,* pp. 150
[31] The Code of Hammurabi is a well-preserved Babylonian code of law of ancient Mesopotamia, dated to about 1754 BC. It is one of the oldest deciphered writings of significant length in the world. The sixth Babylonian king, Hammurabi, enacted the code. A partial copy exists on a 2.25-metre-tall stone stele. Walras León, *Elements of Pure Economics*, (1878) (Routledge 2010) 245
[32] Friedman, M., 'León Walras and His Economic System' (1995) 45(5), *Am. Econ. Rev.,* pp. *900-909*
[33] Latzer, M., and Schmitz S., *Money in Carl Menger and the Evolution of Payment Systems,* (Edward Elgar 2002) 25 -107

dependent on the market, but the state's role should only extend to protecting against manipulation or counterfeiting.

I would argue that this explanation is weak, at best. While it discusses money primarily within the context of payments, it does not provide sufficient detail or evidence in relation to explaining continued modernisation of its physical representation from coins, for instance, to coin alternatives like bank receipts or other paper-type currencies. Also, the explanations of state involvement would be incompatible to explain modern-day commercial bank creation of money through issuing debts.

Secondly, it is problematic to contend that any monetary instrument can become a commonly used medium of exchange without the intervention of any centralised authority possessing some measure of coercion. By restricting the role of the state only to the protection against counterfeiting, the commodity theory of money considerably minimises the relevance or significance of governments in shaping the character and value of money.

The third flaw with the understanding of money by commodity theory is the suggestion that money must invariably perform one function – a medium of exchange – more than other functions i.e. store of value and unit of measurement. Instead, there is scope to argue that the emergence of money as a medium of exchange must occur alongside an equal ability to serve also as a unit of account and store of value. If a commodity is not perceived as having an equal propensity to become a store of value, it is problematic to envision how such a commodity fulfils its function as a medium of payment. It is noteworthy, however, to state that the commodity theory of money explains money within the context of social realities during its time. Given that money was predominantly represented as gold and silver coins, and not as electronic representations in today's modern monetary system, it is perhaps reasonable to expect that the commodity theory would have attained orthodoxy at the time it did – in the 17th and 18th centuries, at least until the abandonment of the gold standard. Nowadays, however, capitalism and wealth expansion through credit systems have justifiably given cause for more advanced and sophisticated forms of money which require different theoretical understanding of money.

The realities of modern money, whether represented as banknotes or digital cash considerably undermines the reliability of commodity theory. Money has become more intangible and separate from commodities now than any other time in history. On this bases, several critiques to the links between barter and money have emerged to challenge the assertions that intrinsic value must be tied to commodities, exclusive of any external factors like government or social interaction.

2.2.2.2 Social Value Theory

In direct contrast to the commodity theory's view on the origin and nature of money, other alternative theories emerged during this classical era. Prominent amongst these was the '*Social-Value'* theory which broadly perceived money through the conceptual lenses of sociology and psychology.[34] Proponents of this theory sought to examine the social roles implicit in money, particularly its function as a measure of *value*. Ultimately, the social-value theory of money perceived money as a crystallisation of social values. One proponent of this theory, Stewart, argued for instance that the 'true value' of money correlates with its acceptance and interactions within society. Centrally, money's innate *value* derives from the importance placed upon the function of money by the entire community.[35] In this regard, therefore, money can only be understood if perceived as a social institution of "fundamental importance" useful in expressing or displaying the relative value of other commodities and enabling the expansion of society.[36] To explain this intricate relationship between money and the community, social-value theorists contended that development of money is a reflection of human ability to identify a nexus between tangible and intangible things such as between commodities and their innate value.[37] Accordingly, it is argued that an inevitable third factor, community, introduced during monetary transactions, supplies money with its real value. Money is thus a tool that embodies the socially constructed values of goods and services. *Simmel* interestingly remarked in support of this point that:

[34] Stewart, W., 'Social Value and the Theory of Money' (1917) 25(10) *J. Polit. Econ.,* pp. 984-1002
[35] *Ibid.*
[36] Einzig, P., *Op. Cit., 5,* pp. 490
[37] *Ibid.*

> The pivotal point in the interaction of two parties [to money transactions] recedes from the direct line of contact between them and moves to the relationship which each of them, through his money, has with the economic community that accepts the money. This is the core of truth in the theory that money is only a claim upon society.[38]

This theory invariably suggests that money is not solely a product of markets, commodities or the state but a bye product of social interactions.[39] By perceiving money beyond physical metals such as gold bullions, social-value theorists must be credited for envisioning the possibility of creating and expanding wealth beyond the conceptual boundaries of physical commodities. Perhaps, its assertions made it possible to treat banks not just as mere intermediaries whose sole responsibility was to serve as a repository for coins and bullion. Contrary to commodity theory, wealth could theoretically be created via credit instruments and loans. Importantly, the concept of money became unshackled from grip of physical commodities.[40]

Social-value theorists also perceived 'society' or 'community' as a flexible concept, evolving in a manner such that its institutions, including money, would always be susceptible to change.[41] The consequence of an ever-changing society meant, according to this argument, that money will invariably always evolve as it fundamentally drives economic activity in society.[42] In this regard, money is merely an abstract idea that can takes on different forms and can continuously be reinvented.

The social-value theory suffers several theoretical pitfalls. Firstly, it assumes the uniformity of social value being capable of aggregation and expression as one indivisible whole. The problem with this assumption is that it does not proffer a credible explanation of different commodity prices, for instance, within one marketplace. In other words, the value of one commodity may differ within one community, depending on need or relevance. As such, for instance, it would be possible for one item to have different prices

[38] *Ibid.*
[39] Proctor, C., *Mann on The Legal Aspect of Money* (OUP 2005) 5
[40] Dodd, N., *The Social Life of Money'* (Princeton University Press 2014) 48
[41] Simmel, G. and Frisby, D., (Ed) *The Philosophy of Money* (3rd edn, Routledge 1990 2011) pp. 147
[42] Einzig, P., *Op. Cit., 5,* pp. pp. 489

within the same market. This theory does not provide a convincing explanation for the lack of price uniformity and its implications on value.

Also, to contend that the value of money is determinable by the entire society suggests that a 'community' must be homogenous and also unanimously ascribe value. A typical example of why this argument is inconsistent is that it contends that a community should always place more value on its own money over money from other 'communities'. For instance, it is inconceivable to contend, as social theorists do, that Nigeria will willingly ascribe less value to its *naira* while attributing more value to the US Dollar. Undoubtedly, the 'value' of money must necessarily be dependent on a range of factors, perhaps also including the unanimous preference of members of such a community. If we consider the production processes of modern economics, it would be rational to conclude that perhaps the value of money has more to do with the cost of production rather than mere social perceptions and interactions.

Secondly, *social-value* theory provides no clues on how to empirically measure 'value' or ascertain which sections of society specifically benefits from money's role in intensifying societal expansion. The suggestions of this theory particularly seem inapplicable and impracticable in a real class-structured society. The problem with the assumption is that if money is solely an instrument to serve society as suggested by social theorists, which class within society benefits the most and why? While social theory provides no answers to these questions, *Marx,* albeit a *metalist*, interestingly theorized money as a social construct, an instrument of wealth creation, for the exclusive benefit of the bourgeois class. As such, money had regrettably become an 'ultimate objectifier' reducing all subjective connection between objects, individuals and intangibles into measurable numerical values.[43] *Marx* was uninterested in furthering arguments of social theory but preoccupied himself with critiquing political economy and capitalism.[44] Interestingly, ideas of social theory bear a striking resemblance with his general idea of it being the beginning of capitalism, such as credit.

[43] Simmel, G., *Op. Cit., 44,* pp. 176
[44] Einzig, P., *Op. Cit., 4,* pp. 489

Another recurring theme within the social-value theory is this idea that money's role and interaction within society evolve side-by-side. Accordingly, the sophisticated relationship between money, symbols and society, is mirrored in society's cultural transformations. As such, cultural changes within society significantly impact upon society's choice of symbolical objects and money.[45] The notion of money as a social tool used to either express abstract value or as a symbolic representation of societal potentialities is inherently limited. Social value tends to treat social interactions and value in isolation from the specific structures which regulate social behaviour. Notions such as rules, social constraint, factors which enable social compliance are considerably left out from social value theories.[46]

I would, therefore, argue that the *social value* theory of money inadequately explains the factors which determine acceptability. It also pays little attention to issues concerning the origin of money. I do not suggest here that tracing the origin of money is significant. However, the coherence of theoretical explanations of concepts like money makes it more likely to explain changes. As a result, background assumptions reached by social-value theory make it problematic to justify modern money, most of which are electronic in form. As such, *social value* theory proffers an insufficient and ambiguous framework for understanding money, which arguably prevents a thorough analysis of the structural frameworks through which money operates in modern society. *Dodd,* in his critique, observed that *social value* is quite abstract and perhaps ineffectual in explaining money in modern society because its "observations on a small scale make little sense without reference to social totality."[47]

In light of the realities of modern monetary systems, the suggestion that money is merely an abstract idea has profound significance. For one, it entails that money, in its purest form, is a social symbol that exists to aid in the expansion of wealth through credit. The

[45] Gatti, J., 'The Definition of Money: A Critique of the Conceptual Framework' (1975) 2(3), *Palgrave Macmillan Journals,* pp. 235
[46] Field, A., 'On the Explanation of Rules using Rational Choice Models' (1979), 13(1), *J. Econ. Issues,* pp. 47
[47] Dodd, N., *Op. Cit.,* 78, pp. 53

conceptual symbolism and representative power of money, as per *Simmel*, particularly aided the capitalists to manipulate a multitude of factors to produce desired results.[48] Issues of money as a tool for social control is not within the scope of our discussion here, but suffice it to say as a social symbol, money is infinitely fungible and all possible representations of money, whether tangible or intangible, would conceptually be regarded as money.[49]

2.2.3 Neoclassical Approaches to Money

An era of thinking influenced by empiricism emerged at the beginning of the 19th century. Led by authors such as *Jevons*, *Menger* and *Walras*,[50] thinkers of this era utilised statistical analysis and economic fundamentals like demand, supply and cost of production to theorise money.[51] Generally, neoclassical thinkers typically perceived money as a 'neutral' exchange-optimising tool that facilitates value exchange through the peculiarity of its functions.[52] Neutrality, according to proponents, means that money is not necessary contingent on how it is manifested. The 'money-ness' of any manifested form depended solely on its ability to perform set functions – as a store of value, unit of account and medium of exchange. The general attitude of neoclassical thinkers was therefore that money must be understood only through economic analysis, without recourse to philosophy, sociology or history.[53]

For instance, *Mishkin* depicted money as "anything that has a fixed and unvarying price in terms of the unit of account and is generally accepted within a given society in payment of a debt or for goods and services rendered."[54] For *Jevons,* Money was perceived as a medium "convenient" for value exchange.[55] In other words, it is money if it functions as

[48] *Ibid.*
[49] *Ibid* pp. 48
[50] "Neoclassical Economics" available at < http://www.investopedia.com/terms/n/neoclassical.asp> accessed 18 October 2016
[51] Ryan-Collins, J., *et al., Op. Cit., 15,* pp. 31
[52] *Ibid.*
[53] Hagnauer, C., 'Schumpeter's Institution of Money: Slipping Off The Border Of Economic Theory and Landing in Economic Sociology' (2013), *Eur. J. Hist. Econ. Thou.,* pp. 34
[54] Mishkin, F., *The Economics of Money, Banking and the Financial Markets,* (Little Brown & Co 1986) 9
[55] Jevons, W., *'Money and the Mechanism of Exchange'* (D. Appleton and Co. 1876) 6

money. This approach to theorising money is often touted as pragmatic since it avoids most if not all the normative questions on origin, qualifying attributes or intrinsic values which classical thinkers were preoccupied with. This simplicity is perhaps the reason why the definition of money as a store of value, medium of exchange and unit of account has remained the dominant definition in present-day study of economics.

Although a simple pragmatic approach is useful, especially in relation to the discussions on cryptocurrency, it would be useful to engage with other broader questions, particularly on the role of the state and law in the emergence of money. However, by solely focusing on functions performed by money, neoclassical economic theories implicitly acknowledge that money does not in fact emerge without an interplay of socio-economic factor of acceptability which ultimately enhance the ability of money to perform payment functions. Acknowledging this point, *Jevons* explored the idea of the inter-dependence of money as a medium of exchange and as a standard of measuring value. He remarked that:

> Being accustomed to exchange things frequently for sums of money, people learn the value of other articles in terms of money, so that all exchanges will most readily be calculated and adjusted by comparison of the money values of the things exchanged.[56]

By the above, neoclassical economists attempt to explain the capacity of money as an instrument of measuring the 'true value' of commodities, without which the distribution of such value would fail. It is therefore unsurprising that neo-classical economics would suggest that money has never seemed to be as precious a thing since it is suitable for nothing by itself because "one must transform it to enjoy it."[57] Neoclassical economics consequently contend that money is neutral because it holds no intrinsic value of itself and is mostly irrelevant except to convey or store value.

Neo-classical economics abstain from engaging with debates on the normative meaning of value, albeit acknowledging that value is not typically a component of money. Attempts

[56] *Ibid.*

[57] Rousseau, J., *Confessions, Collected Writings of Rousseau,* Edited by Kelly, C. R., Masters, D. and Stillman, P. G., Vol. 5 (University Press of New England 1995) 31

are however made to explain how money is created. For example, the French economist, *Walras,*[58] *came* up with the 'competitive equilibrium' theory suggesting the existence of an 'invisible hand' which stimulates the creation of sufficient money for the entire system and after that self-cleanses to remove any leftover.[59] To justify this theory of a self-catered market economy, *Walras* examined the constant flux in commodity prices and concluded that money reacts and adjusts to market realities but is entirely redundant[60] and irrelevant on its own.[61] Accordingly, the value of money within a competitive exchange market is not determined by any extraneous factors but instead exclusively by market variables of demand and supply.[62] This approach is however somewhat inconsistent. First, it suggests that money is redundant by itself because nothing can be called money in isolation. The implication is that, if discussed within the context of politics or law, money is merely a useless instrument if it fails to function as such, regardless of whether such instrument is legally earmarked or politically backed as such. If stretched far enough, the inconsistency would become even more apparent to undermine the existence of financial instruments because, if information asymmetry is eliminated and people have access to full information about goods and services, they would simply exchange such goods and services without any need for money.

Ryan-Collins criticised this approach to money as based on "generalisations, assumptions and simplifications so far-fetched that they fatally undermine the model."[63] The conclusions could therefore be rightly adjudged, from the viewpoint of the realities of modern finance, as insufficient to explain the complexities of a bank-run system where an array of payment instruments and institutions are interwoven and interdependent. I would argue, therefore, the idea that money is neutral and only measurable by market

[58] Léon Walras pioneered the development of general equilibrium theory based upon mathematical calculations to explain the behavior of supply, demand and prices in a whole economy by seeking to prove that the interaction of demand and supply will result in an overall equilibrium and serve as a benchmark of efficiency in economic analysis.
[59] Marx, K., (1867), *Das Kapital, Band I*, English translation by Samuel Moore and Edward Aveling of the 3th German edn (1883) and additional translation by Marie Sachey and Herbert Lamm from the 4th edn., *Capital, Volume I* (Chicago, IL: Encyclopaedia Britannica 1952).
[60] Nelson, A., *Op. Cit., 17,* pp. 24
[61] Marcello, M., *(ed) Karl Marx's Grundisse: Foundations Of The Critique Of Political Economy 150 Years Later* (Routledge 2008) 54
[62] Moseley, F., *Marx's Theory of Money: Modern Appraisals* (Palgrave Macmillan 2005) 21
[63] Ryan-Collins, J., *et al., Op. Cit., 15,* pp. 33

forces inadequately justifies the interface of money with external validating factors from which relevance or acceptability is attributed. I am inclined to agree with *Minsky* where he states that "in a capitalist economy, resource allocation and price determination are integrated with the financing of outputs, positions in capital assets and the validating of liabilities. This means that nominal values (money prices) matter: money is not neutral."[64]

Unlike the commodity theory which attempted to justify the role of the state in coinage, neo-classical theory completely disregards the relevance of extraneous factors, beyond economic variables, regardless of whether such extraneous factors play potentially significant roles in influencing monetary demand. As such, factors such as the role of the state or law do not therefore play any role in the emergence of money. I would argue that neoclassical economic theories of money, albeit competently describing functional aspects of money, provide insufficient insights into other socio-political aspects of money. Of course, money is not merely a reflection of functional realities because, by the very suggestions of neoclassical economics, a multitude of instruments invariably become money. Instead, I would argue that money cannot function in a vacuum. It must be defined within the context of social norms, authority and, perhaps, political power. The inadequacies with both economic approaches to money, especially in relation to the role of state actors, produce more questions than answers. Scholars dissatisfied with classical and neoclassical explanations have evolved several alternative theoretical explanations to explain money and its relationship with the state.

There are slightly different variants of neoclassical thinking on the nature of money. Although most allude to money in its functional capacity, different schools of thought have explored money distinctly. The prominent schools would include the state theory of money and the modern monetary theory.

[64] Minsky, H., *Stabilizing an Unstable Economy* (McGraw-Hill 2008) 159 - 160

2.2.3.1 State Theory of Money

The idea that money derives its superior quality through state authority is not new. It was first argued by classical thinkers like *Karl Marx,* who wrote extensively about the role of the state in ensuring circulation of gold coins. He particularly justified seignorage[65] as a streamlined means of guaranteeing the quality and exchange value of metals. But a comprehensive state theory of money was first developed by *Knapp* claiming that money and its value are mostly dependent on state issuance, and not as a result market-exchange activities.[66] He criticised economic theories particularly metallism as "absurd" for deducing a monetary system without the idea of a state.[67]

State theory contends that *fiat* of a state's ruler determines what constitutes money within such state particularly by ensuring what kind of money is accepted as payment levies and taxes at its counters.[68] State theory centrally contends that there exists a hierarchical order in which many mediums facilitate value exchanges but the State, through institutions and laws, ultimately determines which specific mediums attain the apex position within the hierarchical order.[69] In other words, money is perceived as a token which gains validity when the state proclaims its acceptability as a means of payment. It is from this premise that state theory proceeds to conclude that such state proclamation helps in accentuating government money. To justify its arguments, proponents employ a 'method of reduction'[70] to explain legitimacy by pointing out how the state determines its money using laws which consist in the commands of a political sovereign to create legal obligations.

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[65] It is the economic cost of producing a currency within a given economy or country. Governments can make profits if the cost of producing currency is positive when compared with the value of the currency. Seigniorage can therefore become a revenue for a government when the money that is created is worth more than it costs to produce.

[66] Knapp, G., *The State Theory of Money, (1924, London: Macmillan),* Available at http://socserv2.socsci.mcmaster.ca/~econ/ugcm/3ll3/knapp./StateTheoryMoney.pdf> accessed 12 March 2016

[67] *Ibid.*

[68] Bonar, J, *'Knapp.'s Theory of Money'* (1922) 32(125), *Econ. J.,* pp. *39*

[69] Bell, S., 'The Role of The State In The Hierarchy Of Money' (2001) 25, *Camb. J. Econ,,* pp. 149 - 163

[70] Used by legal positivists to explain the constituents of legality in terms of something else more foundational. Philosophers use "theory reduction" as a term of art to symbolize the practice whereby a theory expresses and is used to explain the facts and principles described by a less basic theory. The reducing theory thus conserves the ontology of the reduced theory. See Marmor, A., '*The Nature of Law: An Introduction'* (Routledge 2012) 5

Tenets of the theory are also often justified by reference to judicial and statutory restatements. For example, in 1837, the American Supreme Court in *Briscoe v. Bank of Commonwealth of Kentucky*[71] was faced with deciding whether the Bank of Commonwealth of Kentucky had the authority to issue banknotes privately. The court held that issuance of currency under laws enacted by the Kentucky legislature contravened the constitutional powers to issue currency reserved on the federal government. The court resultantly upheld the supremacy of the American constitution over the private issuance of currency. Similarly, following UK's Sydney Branch Mint Act of 1863 which conferred on British monarchy the power to declare gold coins struck in the colonial branch of Sydney, a Royal proclamation issued on January 14, 1871, declared that any piece of money coined in faraway colonial Sydney be legal tender in the UK.[72]

Proponents of state theory also often rely, for evidence of its assertions, on modern taxation regimes which are indicative of government intervention in processes of money creation.[73] *Keynes* particularly believed, just as *Knapp* did, that the state determines what money is. He remarked:

> The state, therefore, comes in first of all as the authority of law which enforces the payment of the thing which corresponds to the name or description in the contracts. But comes in doubly when, in addition, it claims the right to determine and declare what thing corresponds to the name, and to vary its declaration from time to time – when, that is to say, it claims the right to re-edit the dictionary. This right is claimed by all modern states.[74]

The enormous powers to set rules on what it accepts as money, mostly through taxation, *Keynes* argued, enable the state to determine the acceptability of money and enact laws

[71] *Briscoe v. Bank of Commonwealth of Kentucky* 36 U.S. 11 Pet. 257 257 (1837): The main issue before the court was whether the enactment of the Kentucky legislature vesting powers on the bank to issue currency were inconsistent with the provisions of the United States Constitution. The constitutional provision prohibited the issuing of "bills of credit" by states and rendering any such issuance unconstitutional null and void.

[72] *Adelaide Electric Supply Co Ltd v Prudential Assurance Co Ltd* [1934] AC 122

[73] Mitchell-Innes, A., '*What is Money?'* (1913) *Banking Law J.,* 377, 398

[74] Moggridge, D., (ed), *The Collected Writings Of John Maynard Keynes, Vol XXVII* (Cambridge University Press 1983) 37

against counterfeiting in the protection of its own 'money-creation franchises' or prohibiting privately-provided alternatives.[75] This historical approach is however somewhat problematic, especially when observed in the context of pre-colonial African societies. The argument suggests that a system of taxation and central levy collection existed side-by-side with organised government. There is little or no historical evidence to sustain such a claim in ancient pre-colonial Africa. For example, the geographical area now referred to as Nigeria, prior to being subsumed into British colonial rule, were organised into small clans and tribal nations without centralised government-like authorities. In such quasi-government administrations run by family heads, levies imposed upon the market did not take the form of 'money' but rather actual goods and farm produce. In fact, in pre-colonial southern Nigeria, full on taxation was introduced only after the enthronement of colonial rule. In these societies, history records that market exchange commodities such as manillas[76] and brass rods with intrinsic value existed and were accepted as payment well before colonial governments introduced gold, silver and copper coins.[77] As such, taxation regimes only arrived on the shores of former colonies like Nigeria following the application of English common law. The critique to historical foundations of theories of money as formulated by classical thinkers have grown loud. These critiques are engaged with in a subsequent section.

Another suggestion made by early proponents of this theory is that the nature of money must always exclusively be dependent on the state. This argument is not without criticism. For instance, it has been argued that pegging issuance of money solely on state direction creates government monopoly and can impose limit economic activity, especially given the growing spate of digital forms of monetary exchange.[78] *Hayek* seems to have made a similar argument in 1976 long before digital monies emerged. He argued that a competition in currency operation which dislodges government monopoly and enables

[75] English, C., 'Is Privately-Provided Electronic Money Next?' (2002) 20(1), *Economic Affairs,* pp. 1

[76] Manillas were a form of money made of bronze or copp.er used mostly around West Africa produced in large numbers before the colonial period and continued to serve as money until late 1940s. It is reported that they were first exchanged in Calabar, Nigeria, a city of the ancient south-eastern Nigerian kingdom of Calabar. See < http://www.coincoin.com/I024.htm> accessed 1st January 2016

[77] Ofonagoro, W., 'From Traditional To British Currency In Southern Nigeria: Analysis Of A Currency Revolution, 1880-1948' (1979) 39(3), *J. Econ. Hist.,* pp. 623-654

[78] English, C., *Op. Cit., 49*

private alternatives would reduce inflation because "people will make their dealings in a currency they trust."[79] For Hayek, trust and not state or market players should shape discourse on the nature of money.

Contesting this theory of money, *Weber* argued that modern governments are often overly partisan and should not be entrusted with holistically controlling the issuance of money. When governments deal with monetary issues solely for political motives, it tends to restrict the space for private innovation in monetary operations. Limiting private innovation in this sense, it argued, itself poses a threat to the legitimacy of fiat money. This may not be the case in systems where a tendency to misuse state institutions for political or selfish ends is not entrenched. But in societies where politics is rather more tribalized with insufficient safeguards, political leaders may find it particularly easier to manipulate monetary policies, either to shutdown political opposition or civic engagement. This problem is not sufficiently addressed by earlier proponents of the state theory of money, especially given that unrestrained power to create money without any recourse to external factors such as domestic economic productivity or international harmonisation is quite dangerous.

A particularly useful example to further illustrate this point is the response of the Central Bank of Nigeria after civil protests against police brutality in Nigeria. It was reported the Central Bank (CBN) instructed the freezing of bank accounts belonging to "promoters" of the protests and other connected with the protests.[80] Human rights activists have contended this move by Nigerian authorities was an unfair use of "coercive financial measures to suppress" against civil protests.[81] Left without private alternatives, citizens of countries where governments can easily confine the political space will have no opportunities to explore innovation and provide economic opportunities.

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[79] Hayek, F., *Choice In Currency: A Way To Stop Inflation* (Institute of Economic Affairs 1976)19, Available at <https://iea.org.uk/wp-content/uploads/2016/07/upldbook409.pdf> Accessed 21 December 2016

[80] <https://www.vanguardngr.com/2020/11/csos-caution-fg-on-implications-over-alleged-freezing-of-bank-accounts-of-endsars-promoters/> 1 December 2020

[81] <https://www.hrw.org/news/2020/11/13/nigeria-punitive-financial-moves-against-protesters> accessed 1 December 2020

Furthermore, it is increasingly plausible to argue that, in most advanced economies, the advancement of innovations in payment systems has increasingly limited exclusive state power in relation to monetary operations. This emerging reality challenges suggestions made by proponents of the state theory of money.[82] These limitations do necessitate the upsurge of a new theoretical explanations of money which reflect on intangibility, commercial banks and the rising relevance of internet and mobile companies on the monetary space.[83]

2.2.3.2 Modern Monetary Theory (MMT)

MMT is a detailed empirical account of the operational realities of interactions between the government and its central monetary agencies, on the one hand, with private-run commercial banking sector on the other. It labels these interactions as 'vertical transactions', being instrumental in shaping monetary operations in the economy.[84] In relation to the nature of money, proponents argue that sovereign or state is a monopoly supplier of currency and can issue currency of any denomination in physical or non-physical forms.[85] Also, the state can never run out of money the way private citizens or businesses can. Furthermore, the state collaborates with non-state institutions to ensure its supply of currency continues unabated with the state reserving for itself monetary powers excisable to achieve state objectives.[86]

MMT builds upon ideas from state theory of money that the state creates fiat money not underpinned by commodities but made exchangeable by its recognition as legal tender. MMT advances this thought by theorising money as an instrument of discharging monetary liability.[87] Just as with the state theory of money, MMT accepts the existence of different forms of money in the economy which operate within a 'money hierarchy'.[88]

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[82] Herian, R., '*Monetary Trends in the United States and the United Kingdom: A Review from the Perspective of New Developments in Monetary Economics'* (1982) 20, *J. Econ. Lit*., pp. 1552-1556
[83] Cesarano, F., '*The New Monetary Economics and Keynes' Theory of Money'* (1994) 21(3), *J. Econ. Stud.,* 39
[84] Tymoigne, E. and Wray, R., 'Modern Monetary Theory: A Reply to Palley' (2015) 27(1) *Rev. Pol. Econ.,* 24-44
[85] *Ibid.*
[86] Cesarano, F., *Op. cit., 83,* pp. 39- 53
[87] Moggridge, D., (ed) *cit., 74,* pp. 33-45
[88] Wray, R., 'From The State Theory Of Money To Modern Money Theory: An Alternative To Economic Orthodoxy' (2014) Working Paper 792, *Levy Economics Institute of Bard College,* pp. 15

However, to become widely acceptable, any financial or non-financial asset typically usable in discharging debt liabilities or facilitating exchange of value must ascend the money hierarchy. The closer to the top an asset is, the more it is treated as money.[89] The ascension of government money in this hierarchical order is often attributed to monetary policies designed and pronounced by state institutions such as quantitative easing and foreign borrowing.[90] By this proposition, the irrelevance of money's manifestation is affirmed. Money can indeed take any form, whether tangible and intangible, so long as it performs its requisite functions.[91]

The description of money under this theory is set on the background of how money is created in modern economies today. It is essential to understand how the role of central banks and commercial banks contribute to the processes of making money. This analysis would require an examination of the functions which these modern banks perform. Commercial banks, on the one hand, make loans, allow customers to make electronic payments, provide physical cash and accept deposits. In its primary function of making loans, commercial banks increase their liabilities and assets in tandem, creating new liabilities and new assets. By so doing, banks increase the balance of a borrower's bank account without decreasing the value of anyone else's account, thereby increasing the amount of money in circulation.[92] In effect, commercial banks, by issuing loans, create money – *commercial bank money.* There are two implications to this money-making activity. Firstly, commercial banks play a significant role in determining the amount of money in circulation in the economy since they can decide the amount of loans to issue. Secondly, by being able to decide which sectors of the economy loans will be apportioned to, commercial banks determine who they will lend money to and how such loans are to be used.

[89] McLeay, M., *et. al.,* 'Money in The Modern Economy: An Introduction' (2014) 54(1), *BoE Quarterly Bulletin Q1,* pp. 4
[90] Fullwiler, S., 'Modern Monetary Theory—A Primer on the Operational Realities of the Monetary System' (2010), *The Levy Economics Institute,* pp. 1-34
[91] Fischer, B., 'Banking and Interest Rates in a World without Money: The Effects of Uncontrolled Banking'(1970) 1, *Journal of Bank Research,* 9 – 20
[92] Jackson, A., and Dyson, B., *Modernising Money: Why Our Monetary System is Broken and How it Can Be Fixed,* (Positive Money 2012) 48

Central banks, like the BoE, also play a crucial role in the creation of money. First, central banks create electronic money which commercial banks utilise in settling interbank payments – referred to as *central bank reserves.* Additionally, central banks directly issue central bank money i.e., banknotes and coins into the economy which citizens use in discharging every-day payment obligations. In modern economies, however, monetary supply is complex, it must take a vast number of factors into consideration. Notwithstanding this complexity, MMT makes a case that although control of monetary policy and issuance is quite centralised, other actors such as commercial banks play significant roles in determining the amount of money in the financial system. The complex relationship between credit and wealth creation means that governments must appreciate the role of commercial banks in spurring economic activity and increasing money supply. One weakness of MMT is that, like commodity theory, it does not engage with the question of monetary form, on the one hand. It also accepts as unchallengeable the power of the state in controlling and issuing money.

This detachment from a discussion about the monetary form is however beneficial to our discussions on cryptocurrency. Representing money in one particular way, whether as physical tangible objects or intangible digital tokens, does not necessarily alter the 'moneyness' of any payment instrument. I would therefore argue that although MMT provides a functional framework in which cryptocurrency can be treated as money due to its functions, it tends more heavily towards economic analysis without reference to the role of social factors in the emergence of money. In other words, by only examining the economic factors that give rise to digital money, without any reference to social attitudes that may influence widespread use of any one digital exchange medium, MMT provides a somewhat one-sided argument. There ought to be a case made for social issues such as protection of liberties or civic engagement which may make the use of cryptocurrency as useful as state-franchised digital payments. acceptance an emerging instrument such as cryptocurrency.

Like the state theory of money, MMT attributes money as existing within a hierarchy of 'horizontal' and 'vertical' transactions between state and non-state actors. The closer a medium of exchange to the apex of this hierarchy, the more its chances of becoming

mainstream money. Given that the creation of cryptocurrency are currently outside the control or scope of state and state-franchised institutions like commercial banks, cryptocurrencies may potentially be excluded from MMT's estimation of money. But 'moneyness' according to MMT is more a matter of degree – any payment instrument can move closer or farther from the apex of the money-hierarchy. The approach taken by MMT in this regard, therefore, suggests that government-issued fiat-currency is likely to remain dominant, provided the governments implement appropriate policies. As such, whether or not government-issued fiat allows for the co-existence of cryptocurrencies would depend on government policy.

It therefore follows that perhaps the question to ask is not 'what does cryptocurrency do?' but rather 'who issues cryptocurrency?' For if it is issued by governments, such as with suggestions for issuance of Central Bank Distributed Currencies (CBDCs), then such a currency would be close enough to receive state authorisation and hence legalisation.

Accordingly, MMT would conclude that cryptocurrencies and other non-government-issued mediums of exchange, though may possess money properties, will be unable to compete with government fiat, except where such government-fiat constitutes 'bad money,' i.e., if government monetary policies lead to inflation. In this regard, recent economic events in Venezuelan might serve a good example of MMT's response to cryptocurrency. Following the slump of global oil prices in early 2015, cryptocurrencies alongside other foreign currencies began to overtake government fiat as a preferred medium of exchange and store of value.[93] Many Venezuelans did not trust the national currency given the extremely high inflation within the economy.[94] Granted that cryptocurrencies may be unable to compete with government fiat, but MMT does not necessarily disqualify cryptocurrency from being considered as money. Its only limitation is when compared with fiat currency. That cryptocurrency seems unlikely to overtake fiat

[93] Laya, P., 'Venezuela is Jumping into the Crypto Craze' (20 February 2018) *Bloomberg BusinessWeek,* available on <https://www.bloomberg.com/news/articles/2018-02-20/venezuela-is-jumping-into-the-crypto-craze> accessed 21 January 2020

[94] Long, G., 'Trust is The New Currency in The Surreal Venezuelan Economy' (28 May 2018) *Financial Times,* available at <https://www.ft.com/content/6ab41444-5ff8-11e8-9334-2218e7146b04> accessed 22 January 2020

does not, therefore, mean they should not have a role to play alongside more traditional forms of money. I would argue that whether or not government and society justify the use of crypto-payments should, therefore, depend on any peculiar functions they can fulfil, especially if more traditional forms can be considered unfit to perform such functions.

As such, I would adopt MMT's position that economic functions are crucial in determining money, however, the form in which money ought to take must determinable by an intricate mix of law, politics and social interests. In other words, social benefits of any emerging monetary instrument must be actively considered and reflected in political and legal discuss as it relates to acceptance of such instrument into the hierarchy of money. The overwhelming conclusion from critically examining theoretical understanding of money leads to the finding that modern money can be both tangible and intangible, a product of state and non-state (commercial banking) interactions and enjoy legal backing or not. As such, any instrument can be money regardless of how it is manifested, or acknowledged by the state. However, to ascend the hierarchy of money, such instruments must achieve some level of legal recognition and state approval. In relation to cryptoassets, it will be important to assess to what extent it enjoys legal protection or state approval on its journey towards achieving public adoption.

As evidence from Venezuela and Zimbabwe suggest, government fiat currencies are not without its problems. For cryptocurrencies to move closer to rivalling or complementing government fiat currencies, significant effort will need to put into articulating the benefits of crypto to the highly complex financial system. The future outlook for crypto is still subject to much debate. There is no gainsaying that cryptocurrencies pose a disruptive threat to the monetary system. However, its acceptance by some individuals and internet merchants as valid forms of payment demonstrates that crypto has gained some prominence.[95] Regardless of where monetary theory positions cryptocurrency, its present and perhaps future evolution will continue unabated. This means that some of the limitations and challenges posed by cryptocurrencies, which are discussed in a subsequent

[95] Top 10 Bitcoin Merchant Sites <http://www.forbes.com/sites/jonmatonis/2013/05/24/top-10-bitcoin-merchant-sites/#2fa8db66fe42> Accessed 18th October 2016

chapter, will have to be addressed. But this will not happen if law and regulation do not adjust to provide appropriate governance frameworks which address its limitations. It will be therefore be important to come up with a framework for understanding this emerging technology and designing appropriate legal responses. But first, how does law conceptualise money?

2.2.4 Money in the Context of Law

In relation to methods, early legal research sharply contrasted with approaches taken by economic, sociological or empirical disciplines.[96] In contrast, most early legal scholars simply depicted money as a social construct which is later given legitimacy by law.[97] In other words, although money may originate from social interactions, it only fully receives recognition when legally recognised as such. This legal approach understandably follows on with general legal principles of pragmatism, stability and precision. Money is thus approached in a manner which provides the utmost certainty to legal practitioners, particularly in fulfilment of their general advisory duties.[98] Not taking such a direct and precise approach would lead to, at least for lawyers, inconsistent interpretations when faced with competing plausible interpretations. For instance, monetary provisions in contractual disputes or testamentary instruments may give rise to diverse interpretations of what should constitute money, depending on context and circumstances.[99]

The English Court of Appeal emphasised this point in *Diplock v Wintle*[100] when it was faced with deciding if a cheque amounted to money. The Court observed that "we do not think that confusion can be avoided unless the meaning of the word "money" as used in

[96] Proctor, C., *Op. Cit., 29,* pp. 4

[97] Legal theory generally questions what the law is and where it comes from. Generally, the three main theories i.e., the Natural law, positive law and realism all prescribe different answers. Questioning the origin of law, the theories argue whether it emanates from morals, natural occurrences or from pure legislation and political will or perhaps following idealism.

[98] MacNeil, I., 'Uncertainty in Commercial Law' (2009), *Edin. L.R.,* pp. *68*

[99] In the ancient case of *Wright v. Reed (1790*) 3, T.R. 554, it was established that banknotes constituted money within the Annuity Act. According to Lord Kenyon: "Banknotes are considered as money to many purposes." Although there are conflicting decisions on this matter, but it is important to note that on each occasion the courts relied on the interpretation of specific statutes

[100] [1948] Ch. 465

connection with this case in question is kept in mind."[101] It is these considerations that led *Mann* to conclude that "from the viewpoint of law, economic functions of money are not sufficient, though not unimportant."[102]

It therefore appears that a resulting legal theory of money is not interested in the questions which typically concern economists or sociologists in relation to money's origin, its manifested form and other social issues underpinning usage. Theorising money strictly as legal tender, legal understanding of money is useful because contending, as the neoclassical economists did, that everything is money that functions as money potentially extends the conceptual framing to a vast array of financial instruments that can perform money-like functions. In this sense, law narrows and sharpens its focus on what instrument should ultimately be legally treated as money. But this approach is not without problems. It does not acknowledge, for instance, the impact of social factors such as changing habits, technological innovation or inefficiency in its matrix of what is money. By its very nature, conceiving money within this frame is rather inflexible, not providing conceptual room for potential enlisting of new forms of digital money.

On the question of flexibility, proponents of this theory would argue that by providing legal certainty through the use of precise statutory provisions, law provides guarantees which ensure people are willing to accept 'legal tender' in discharge payment liabilities;[103] and also legally empower governments to safeguard the value of money against counterfeiting and other aspects of criminality.[104] *Mann* especially claimed that law is the singular most important factor in establishing what amounts to money. Relying on historical evidence, he argued law aided in guaranteeing the quality of coinage and has evolved as the exclusive determinant of money. This exclusivity was re-echoed in 1604 in the *Mixt Monies* case[105] where the Court approved the English government's project to

[101] *Diplock v Wintle* [1948] Ch. 465, 522
[102] Proctor, C., *Op. Cit., 29*, pp. 7
[103] Atiyah, P., *The Rise and Fall of Freedom of Contract* (OUP 1979) 101
[104] *Ibid,* where Atiyah traces the evolution of paper-money from the need to guarantee expectations of state coins which were threatened by the market practice of melting down the valuable precious metals and reselling as mere metals due to its reduced official value in comparison to its metal content. However, with regards paper money, he attributed legalisation to the need to maintain some form of social acceptance especially because they were not based on any precious valuable metals.
[105] *Gilbert v Brett* (1604) an English translation of the case appears as (1605) 2 *Howells State Trials 114*

empty Ireland of its old commodity-based coinage and to replace it with debased silver and copper tokens. The case reaffirmed the power of the government to issue '*legal tender*' and established place of law in relation to money.

One theme that emerges from the legal treatment of money is the nuanced reliance on state authority manifested through statutory enactments and economic functions of money. Unfortunately, the suppositions of early legal scholarship assume that laws automatically compel obedience without the operation of extraneous social factors. Its suggestions, therefore, provide insufficient substantive reasons for normalization of money through statutes. However, the practical realities of law-making, especially in modern democratic societies, often require a level of civic engagement and social consensus. For instance, authorising the use of greenbacks in America, abandoning the gold standard or replacing Irish metal coinage with debased substitutes, it is argued, were all legal steps taken to legitimize popular government actions, in pursuit of war suppression of the rebellion.[106] *Fox,* therefore*,* observed these reasons were not substantive enough to justify normalisation of money mainly because same results were possible without recourse to legalisation.[107] Furthermore, its insistence on achieving certainty and stability of concepts also makes the legal approach rather inflexible and static. This means that the law finds itself unprepared for unexpected and revolutionary changes in the monetary system.[108]

It does appear this legal approach to money follows on from the state theory of money, especially because it accepts conclusions that the state's constitutional infrastructure should provide the *Grundnorm* for the monetary system. This makes it comfortable, at least from a legal perspective, that money should be supplied via law with certainty and clarity. But statutory provisions on legal tender do not provide any in-depth analysis as to what the role of law should be, especially given the relevance of politics in law making. *Pistor* attempts to supply the analytical depth missing from the legal approach to money in a new legal theory of finance (LTF) in which an explanation of the relationship between

[106] Fox, D., 'Case Study: The Case of Mixt Monies' (2014) Paper No. 70, *University of Cambridge Legal Studies Research Paper Series,* Available at < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2539518> Accessed 26 December 2016
[107] *Ibid.*
[108] Phanor, E., 'Legal Theory of Money' (1934) 20(3), *Cornell Law Review,* pp. 52, 52

law and finance is proffered. Accordingly, the theory argues that law plays a crucial role in the configuration of modern finance to the extent that all financial assets and instruments, including money, are legally constructed. Law here is perceived as a tool often utilised to provide legal vindication to financial instruments in the achievement of set objectives. Law is important but so also is the state. By this argument, *Pistor* refutes the idea that modern monetary operation is entirely dependent either only on the state or only on the law. Instead, by analysing markets and finding the existence of hierarchical structures within the economy, *Pistor* concludes that law becomes fundamental to ensuring financial stability because it reduce tensions between key participants of the economy. So according to this argument, law serves as a useful tool for resolving tensions between competing interests in the economy. And so, law would be used to vindicate a particular financial instrument only where such vindication would serve to reduce tensions between competing participants.

Unfortunately, LTF observes an anomaly in law's response to tensions – 'the paradox of elasticity'. Recognising that "we cannot fully predict the future,"[109] LTF rightly acknowledges that laws require a considerable measure of elasticity to continually re-adjust to validate the emergence of financial instruments. However, its elasticity is only relative, it relaxes and contracts in response to changing or future financial obligations, depending on proximity of such financial instruments to the apex of the financial hierarchy. This observation is a profoundly accurate description of the role that law played leading up to the introduction of 'electronic money' in Europe in the 90s.

In its early days, 'electronic money', a term used to describe innovative debit cards issued by commercial banks, were considered by economists and policymakers as constituting a "threat to national sovereignty" and fiscal powers of central banks.[110] A study commissioned by the European Central Bank in 1994 found that "a viable cashless alternative for small amounts will become available, threaten the ability of customers to pay with notes and coins, and the role of central banks as suppliers of banknotes could

[109] *Ibid.,* pp. 316
[110] Kobrin, S., 'Electronic cash and the end of national markets' (1997) Vol. 107 *Foreign Policy,* 65

theoretically disappear."[111] The Report concluded that the introduction of electronic alternatives to cash would be in "contradiction with the legal tender regulations in some EU countries"[112] and be "incompatible with fundamental central bank responsibilities of maintaining the integrity, stability and efficiency of its country's payment system and for the conduct of monetary policy."[113]

Despite its findings, the Report recommended that EU central banks not adopt a "wait and see" approach to the challenges posed by private-sector-driven 'e-money'. The ECB identified several possible steps which EU central banks could take to "restrict the issuance"[114] of e-money to specific institutions while retaining supervisory control or directly participating in the issuance of such e-money. It was in response to these recommendations from several studies[115] that the EU Parliament enacted the Electronic Money Directive 2000[116] as the first major attempt to address the perceived risks of e-money. The Directive empowered central banks to perform prudential supervision of e-money business and institutions and reserve the issuance of e-money to "electronic money institutions" (EMIs) [117] and banks except credit institutions.[118] Under the Directive, EMIs were subject to several restrictions such as only carrying on financial services of issuing and administering electronic money without issuing credit; [119] limitations on investments;[120] and not holding any other undertakings except in performance of operational functions related to e-money.[121] Similarly, EMIs were required to have an initial capital of EUR 1 million;[122] to have sound and prudent internal control mechanism; and prudent administrative, management and accounting procedures.[123]

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[111]The European Central Bank Report to the Council of European Monetary Institute, (1994) Pg. 7: See <https://www.ecb.europa.eu/pub/pdf/other/prepaidcards1994en.pdf> [29 June 2019]
[112]*Ibid*.
[113]*Ibid*.
[114]*Ibid*.
[115]European electronic money proposals on clear regulatory framework (1998) ip/98/727 < http://europa.eu/rapid/press-release_IP-98-727_en.htm?locale=en> [Accessed 23 June 2019]
[116]Directive 2000/46/EC
[117]Article 1(1) Directive 2000/46/EC
[118]Article 1(3)(a)
[119]Article 1(5)(a)
[120]Article 5
[121]Article 1(5)(b)
[122] Article 4(1)
[123]Article 7

The point made above is that the EMD was indeed a response to an emerging tension between central bank authority and commercial bank interests. To ease this tension, the EU Directive opted to statutorily define e-money as the following:

> Electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions and which is accepted by a natural or legal person other than the electronic money issuer.[124]

On this occasion, the law was adjusted and was flexible to, as argued under LTF, accommodate technological innovations introduced by commercial banks because their interests ranked sufficiently high and close enough to those at the apex of the hierarchy.

It can be argued that by defining what constitutes "e-money" to exclude other forms of electronically stored monetary value,[125] the law has exclusively conferred the status of money on a select category of electronic tokens irrespective of their respective quality, social value or function.

I quite agree with assertions of LTF that money cannot be defined exclusively as a product of economic factors. There is a complex relationship between the state, economic factors and legal instruments which play different roles in relation to money. For instance, money might emanate from the market, receive vindication from law and attain widespread public trust by covert actions of the state. To treat money as narrowly emanating from either politics, law or the market might therefore be somewhat presumptuous. To untangle this complex relationship, especially in terms of emerging technology, it will be important to understand the sequence of technological innovation. I would therefore argue that law, by its very nature, only precedes the emergence of a new financial instrument. It cannot,

[124]The Electronic Money Directive 110/2009/EC, Art. 2

[125] By Article 2 of the EMD, these included electronic tokens that can either only be used to acquire goods or services in an issuer's premises; used within a limited network for a limited range of goods; or transacted for goods and services only usable through digital devices.

therefore, be the starting point of a discussion about whether a financial instrument should be utilised for discharging payment obligations.

2.2.5 Reflections from Theory

Our discussions above have generally been built on a few assumptions. These include that the issue of physical money is the exclusive prerogative of an issuing state operating as monopoly within the monetary system. Neoclassical approaches, particularly the state theory of money, continue to hold sway over its more aged classical approaches. However, the state theory of money which recognises the enormous role of the state does not completely dominate the theoretical landscape. Aspects of the social-value theory which focus on the nature of money as a result of social interactions is particularly interesting. This means that, in practice, anything that functions as a medium of exchange between parties must be regarded as money between those parties, even though it lacks the authorisation required by the state theory.

As identified in our discussions on legal approach to money, this more functional perception of money is insufficiently clear or certain. Although both approaches appear somewhat contradictory, one arguing for legal vindication and the other focusing on functionality, I would argue that the serve slightly different purposes. The social-value theory provides a more credible description of the historical origins of money and the role of society in adopting a medium of exchange. In contrast, the legal approaches, particularly the legal theory of finance deals more with the role of law in moderating these social interactions which occasion the rise of monetary mediums. That said, the notion that society can create a means of exchange necessarily connotes that the medium concerned is substantially accepted within the community concerned. The critical perspectives of cryptocurrency will be considered below.

SECTION II

2.3 CRYPTOCURRENCY IN MODERN MONETARY THEORY

Having now considered the historical and theoretical frameworks of money, including how money operates in modern banking systems, it is now essential to determine whether cryptocurrency fits into existing theoretical discussions on what constitutes money. To be categorised as money, anything must currently fulfil three conditions – it must function as a medium of exchange, a store of value, and a unit of account. The reasons for these functions are mostly economic. However, from a legal perspective and for the purposes of this chapter, focus will be placed on cryptocurrency's performance of the exchange function. As *Goode* once asserted, "the crucial question is not what constitutes money but what constitutes payment."[126] The point made here is that in a time where electronic payments have become prevalent, what is important is the ability of any medium to satisfactorily serve as a medium of exchange without creating a problem of double coincidence of want. It is this quality which sets any medium apart from all the others.

Undeniably, cryptocurrencies are distinctly different from fiat money in that they are not centrally issued and can operate independently of financial intermediaries such as central banks which often settle transactions. Its peer-to-peer system ensures that transactions can be validated and verified much quicker, thereby potentially eliminating the need for intermediation by commercial banks. By this unique feature, it is problematic to align cryptocurrencies with current theoretical thinking, particularly the state theory of money.

In contrast, the legal theory of money takes the approach that although anything may function as money, attaining the status of 'currency' or 'legal tender' is exclusively dependent on statutory recognition. For such determination, recourse is not exclusively made to its functionality as a medium of exchange. For instance, while the Pound Sterling is legal tender in the UK, it would fail to discharge payment obligations abroad because the force of domestic law is only applicable within the scope of the domestic jurisdiction of nation-states. At the moment, there are no domestic or international laws which confer

[126] McKendrick E., (ed), *Op. Cit., 1*

on cryptocurrencies the status of 'legal tender'.[127] As such, cryptocurrencies cannot be considered an official currency. However, as demonstrated earlier, the inflexibility of law is arguably the undoing of the legal theory of money, especially in relation to how it responds to emerging innovative technology is concerned. The long and slow processes of law-making therefore means that law cannot respond quickly enough to meet with realities of changing instruments or practices.

That notwithstanding, not designating a monetary token as 'legal tender' does not necessarily preclude it from functioning as money. This notion is now firmly settled by most mainstream theories, including the legal theory of finance, the state theory of money, modern monetary theory and neoclassical economic theory of money. In the context of online payments, it does appear that for a monetary token to be recognised as money, it is most important that such medium functions for facilitating exchange. This is particularly the case in most other forms of online money, particularly those used in closed online networks, where the other functions of money are not particularly relevant.

In relation to metallism, which presents money as a spontaneous market phenomenon with its value linked with intrinsically valued commodity, it immediately becomes apparent that cryptocurrency cannot be justified as money under the theory of metallism because they are both intangible and have no links to metals or other commodities. The only probably area of convergence between commodity money and cryptocurrency is perhaps that its emergence is in response to transactional difficulty. Under commodity theory, money is said to have emerged as a solution to market inconveniences of barter. This theory of money is severely limited, not only to cryptocurrency but also to modern forms of money. Since the gold standard was abandoned, most countries operate monetary systems without gold or silver reserves. Money, as we know it today, is already mostly electronic and not linked with commodities of any sort.

In relation to social-value theory, the relevance money linked with socio-cultural realities within society. As such, the acceptability of money and its exchange value are dependent,

[127] Vardi, N., *Op. cit., 12,* pp. 55

in part, on the social factors. For some social-value theorists, money is a political and social construct. This string places money as an instrument of state actors. If this were the case, cryptocurrencies, often described as 'disruptive' would occupy the fringes of social-value theory. However, on the other hand, other strings social-value theory discuss money as being a 'communally accepted' medium of payment whose value and its community determines form. If cryptocurrencies serve an online community, would that make it money to that online community? It is unclear according to social-value theory how such decisions are reached. At best, the social-value theory does not provide any robust framework suitable for describing cryptocurrency as money.

For neoclassical economic theorists, money is understood as anything that performs three functions, i.e., serves as a medium of exchange, as a unit of account and as a store of value. Its critiques rightly show how money cannot exist without laws or the state. Cryptocurrency might well fit within neoclassical economic theories considering its functions. I would, however, argue that the financial system importantly requires legal rules which, amongst other things, can reduce uncertainty and protect against violation of rights and liabilities. As such, I would find that an absence of legal certainty, when combined with a growing prominence of cryptocurrency, will be counterproductive.

The failure of neoclassical economics to explain money in the context of the law and state has left a theoretical gap which has now been filled by the legal theory of money, *the* legal theory of finance, *Knapp's* state theory of money and modern monetary theory. All these theories explore and justify the relevance of state actors and law in constituting money. One common thread that runs throughout these theories is the notion of a hierarchical order of money, i.e., the existence of several forms of money differently positioned within the hierarchy and depending for relevance on the state or statutory recognition. The legal theory of finance, however, extends this idea by identifying law as the primal factor which constitutes the entire financial system, including money. But as *Pistor* acknowledges, legal rules which define money are not only in public law forms but may take the form of private legal instruments such as contracts. This notion of public and private law seems apt to justify cryptocurrency which, like most other financial instruments, are underpinned

by contractual agreements between participants such as, in the case of Bitcoin, Issuers, miners, and users.

Pistor rightly observes that legal rules which constitute the financial system are dynamic and constantly adjusting to market realities. But it is suggested that legal elasticity benefits actors in the financial sector closest to the epicentre. It begs the question; how will the elasticity of legal rules benefit cryptocurrency institutions and operations? In its current form, cryptocurrency does not emanate from banking activities, nor explicitly receive state approval through legal recognition. Rather, cryptocurrency is constantly described by financial sector actors as a disruptive technology. The implication is that cryptocurrency operation is likely not to benefit from changes to legal rules, especially if targeted at 'legal tender' transactions or banking regulations. The legal recognition of cryptocurrency will, therefore, have to be bespoke and specifically target cryptocurrency transactions in a manner which streamlines it with existing legal rules.

2.4 REFLECTIONS AND CONCLUSION

This chapter has provided a theoretical map of money, tracing theoretical debates on the nature of money from classical to modern times. The chapter presents an analysis of money's theoretical framework with the aim of potentially situating cryptocurrency within current frames of thought. The first half of the chapter examines discussions on money from different theoretical perspectives which have not remained static. The second half focuses on fitting cryptocurrency within existing theoretical frames on money. The purpose of outlining theoretical changes to money is to provide a framework for understand current events and sets the scene for understanding cryptocurrency as a payment instrument. Most importantly, discussions on the development of monetary theory provides the tools necessary for identifying potential legal problems that will need to be addressed by statutory or regulatory intervention.

While cryptocurrencies undoubtedly constitute a genuine medium of exchange, it is not clear that they would sufficiently meet the criteria of being units of account or store of value. Given that these cryptocurrencies need to be administered by using some form of

computing device, it is tempting to align them more closely with electronic bank money. However, on closer inspection, cryptocurrencies rather have more in common with cash than they do with bank money. Yet they are not cash, not physical and certainly not issued by the central bank. The legal implication is therefore that cryptocurrency is not a chose in action. The string of data that constitutes each unit are unique and specific. It is therefore different from typical bank money which merely embodies a relationship between bank and consumers. From our discussion of the legal approach to money, it is unlikely that current common law would hold cryptocurrency to be a chose in action[128] or legal tender. There is therefore no question that the unique strings of data which make up each unit of cryptocurrency, while sharing characteristics with other forms of value or even serving as a medium of exchange, does not fit perfectly into any existing classification. But the paradox here is that, in trying to define cryptocurrencies from a normative point of view, it is easier to conclude on what they are not than on what they are.

A governance framework will be essential in ensuring that the technology continues to evolve, to provide technical solutions to its constraints and challenges. Absence of an appropriate governance framework ultimately undermines any room for advancements of the technology and to appropriate legal remedies. A proper governance framework will have to ensure that, while cryptocurrencies aspire to gain widespread adoption, there will be sufficient legal clarity. An appropriate governance framework must also ensure that a set of criteria is identified, such as, for instance, it would need to be easy for consumers to use and understand; the social benefits of decentralisation are preserved; adequate consumer safeguards are provided; anonymity, which I argue later in the thesis as a social benefit in the protection of private liberties and choice, would need to be guaranteed without being a conduit for tax evasion or money laundering. Our theoretical discussions on money must now feed through into a critical analysis of the role of financial regulation in advancing technological innovation.

[128] In *OBG v. Allen* [2007] UKHL 21 the court held that items that can be categorised as chose in action does not include intangibles.

CHAPTER III

STATIC FINANCIAL REGULATION AND THE CHANGING FACE OF FINANCE

"We are trying to regulate a digital world with 20th century architecture that was designed for physical assets."[129]

3.1 INTRODUCTION

The previous chapter has mapped out the conceptual framework of money, particularly observing changes to theoretical debates on its nature over the centuries. By reflecting on changing narratives, the chapter sought to situate current developments in cryptocurrency within on-going debates on monetary theory, particularly answering the question whether cryptocurrency fits within existing monetary theory. The chapter concluded that although cryptocurrencies do not fit within orthodox conceptual frames of money as suggested by the predominantly accepted state theory of money, its ability to function as a medium of exchange especially for online payments transactions does indeed qualify cryptocurrency as money, virtually. Therefore, a better approach to addressing the conceptual challenges posed by cryptocurrency is an analysis based on the legal theory of finance – examining the role of law in shaping cryptocurrency evolution. Ultimately, it is argued that focus should not be on whether cryptocurrency conceptually constitutes money. Instead, given its growing popularity, focus should be identifying and enhancing the role of law in relation to any challenges or opportunities posed by cryptocurrency payments.

The previous chapter also identified how cryptocurrency generally present an alternative vision of how the payments system can be organised. Specifically, if it continues to gain popularity, cryptocurrency could potentially disrupt the structure of legacy payment systems, spurring changes to institutions, instruments and processes. This disruptive new vision is well capable of delivering improved efficiency and security to online payments,

[129] Pandit, V., 'Outdated Rules are Holding Back Financial Innovation' (September 2019) *Financial times.* Available at <https://www.ft.com/content/a450f6c6-d622-11e9-8d46-8def889b4137> accessed 21 January 2020

while also potentially offering solutions to socio-economic challenges such as financial exclusion and erosion of democratic values. However, cryptocurrency technology also expose society and the economy to significant risks which render consumers of financial products vulnerable, and undermines governance of legacy systems.

Despite potential challenges and opportunities posed by cryptocurrencies, the search for comprehensive legal categories or response has not yet led to a conclusion. Meanwhile, the innovations presented by cryptocurrencies and blockchain ecosystems will undoubtedly produce forms of conduct that will challenge existing financial regulations. At present, it can be guaranteed that the cryptocurrency ecosystem will eventually become the subject of and shaped by the force of regulations.[130] However, there are still many competing ideas regarding how regulatory intervention should be designed, deployed and targeted. This regulatory conundrum is particularly not served by intensifying private-sector led competition to participate in the so-called fourth industrial revolution by proffering regulatory solutions to the problems created by cryptocurrency.

Unfortunately, previous technologies and practices provide limited guidance to today's regulators on how to predict and address regulatory pressures that new and emerging technologies like cryptocurrency will place on existing regulatory regimes.[131] With this in mind, this chapter seeks to outline which regulatory approaches and objectives would be most suited to address the peculiarities of cryptocurrency. To do so, it will also be important to examine the critical perspectives to regulation such as whether existing regulatory design choices can keep up with cryptocurrency innovation.[132] This chapter ultimately aims to provide the values and objectives which underpin approaches to financial regulation i.e., notions of market efficiency and failure. By critically analysing debates regarding competing normative values, the chapter identifies implications of using traditional values of efficiency and market failure in regulating cryptocurrency. It is

[130] Herian, R., *Regulating Blockchain: Critical Perspectives in Law and Technology* (Routledge 2019) 35
[131] Nuffield Council on Bioethics, "Emerging Biotechnologies: Technology, Choice and the Public Good" (2012) *Nuffield Council,* available at <https://www.nuffieldbioethics.org/publications/emerging-biotechnologies> accessed 28 January 2020
[132] Marchant, G., Braden, A., and Herkert, J., (eds), *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight: The Pacing Problem*, (Vol. 7, Springer Science and Business Media 2011)

argued that efficiency and market success, albeit essential values for driving legal and regulatory policy, are not necessarily well suited to the issuing of evolving technologies like cryptocurrency. Several other social and political issues implicit in the introduction of such radical technologies, such as social protection and financial inclusion, are immeasurable using typical economic matrixes. In any case, arguments about designing regulation to correct or prevent crypto-related problems in the public interest rather presents a 'regulatory paradox'. On one hand, it remains impossible to grasp the full public implications of cryptocurrency given it is still emerging and developing. Principally, public interest protection must be based on concrete information about market behaviour which can undermine market efficiency. But on the other hand, it is yet unclear that cryptocurrency does not advance consumer welfare. By drawing on key themes in relation to emerging technology, this chapter proposes a matrix of factors that policymakers must consider in designing regulatory interventions that can address the peculiarities of cryptocurrency on the payment industry.

3.2 UNDERSTANDING REGULATION

One overwhelming outcome of recent economic events, including the 2007/8 global financial crisis is the renewed interest in economic reforms, some of which advocate for effective government intervention into different economic sectors. Government in many countries, including the UK, have engaged in extensively rewriting the rules governing the financial system.[133] However, intensifying government activity in the financial system has not, historically, always been the accepted policy. More government intervention in the economy has not always been the prevailing view. Those who disagree with increased government intervention in economic management often hold the view that that modern economy is capable of self-control.

The changing attitude towards direct government involvement in economic matters is premised on two grounds. First, recent high-profile accounting scandals have exposed the failures of private actors such as commercial banks and other financial institutions in

[133] Vittas, D., (ed), *Financial Regulation: Changing The Rules of The Game* (World Bank 1992) 12

creating economic instability and systemic shocks.[134] Secondly, the doctrine of the 'invisible hand'[135] implying the ability of market economies to self-correct has been losing validity.[136] New thinking in this regard now consider that although there is need to avoid excessive direct intervention into market activities by the state, indirect intervention introduced through regulation has become inevitable.[137]

But there are still important questions to ask such as, for instance, how must such regulatory interventions be designed to adequately respond to evolving market issues? In relation to cryptocurrency, it would be worth considering whether such regulatory responses are sufficiently designed and deployed in a manner which recognises its important role in driving technological innovation.[138]

3.2.1 Conceptualising Regulation

I now turn attention to the conceptualisation of regulation, and how regulatory goals and, ultimately, the governance agenda for regulating finance is set. Although a term that is notoriously difficult to define with clarity and precision.[139] It has acquired a variety of meanings, sometimes used to signpost forms of behavioural control or as the stifling effect on an industry.[140] One way to perceive 'regulation' is as the 'accumulation' of government activities[141] to achieve specified objectives and affecting market behaviour.[142] In this sense, 'regulation' appropriates within its conceptual framework all state activities geared towards affecting market behaviour. In this broad sense, *regulation* may be used to imply

[134] Clarke, M., *Regulating the City: Competition, Scandal and Reform* (Open University Press 1986) 3
[135] As explained by Adam Smith in his 1776 classic foundational work, 'invisible hand' referred to the indirect or unintended societal benefits that accrue from a free market economy.
[136] Larson, J., 'An Inquiry Into the Nature And Causes of the Wealth of Nations' (2015) 35(1), *Journal of the Early Republic,* pp. 43,65
[137] Kaushik, B., *'Beyond the Invisible Hand: Groundwork for a New Economics'* (Princeton University Press 2010) 134: The notion of 'invisible hand' has its roots in economic theories and argues that unobservable market forces help demand and supply of goods in a free market to reach equilibrium automatically. Introduced by Adam Smith, he argued that an economy can work well in a free market where everyone takes self-interested actions.
[138] Ludlow, K., *et al.,* 'Regulating Emerging and Future Technologies in the Present' (2015) 9, *Journal of Financial Technology,* pp. 151 - 163
[139] Morgan, B. and Yeung, K., *An Introduction to Law and Regulation,* (Cambridge University Press 2007), pp. 4
[140] Ogus, A., *Regulation: Legal Form and Economic Theory* (Bloombury Publishing 2004), pp - 1
[141] "Regulations" in *Jowitt's Dictionary of English Law*, (2nd edn, Sweet & Maxwell Limited 1977) 1529.
[142] Selznick, R., 'Focusing Organisational Research on Regulation', in Roger Noll (ed.), *Regulatory Policy and the Social Sciences* (CA, 1985), pp. 1

activities of both the executive and other government arms of the state.[143] This is a rather broad approach to conceptualising the term.

Another narrower approach to conceptualising regulation is as an exclusive preserve of the law executor. In this regard, regulation must necessarily exclude judicial pronouncements because, by its very nature, judicial scrutiny undermines the requirement of subjecting governmental action to checks and judicial review. Within this context, it is worth agreeing with *Stewart's* definition of financial regulation as "governmental standards or commands, backed by coercive sanctions, requiring private persons to undertake or refrain from specified conducts."[144] This definition connotes the use of 'executive' standards or commands, in contrast to judicial duty, directed at private persons.

This susceptibility to varied definitions stem from, as argued by *Majone,* the fact that 'regulation' is fundamentally a "politico-economic" concept best understood by reference to different systems of economic organisation and the legal forms which maintain them.[145] It is important to commence our task of defining 'regulation' by considering what it is not. Regulation, though a form of law utilised by state, is often used to correct perceived deficiencies in the market. This is best appreciated when discussed in the context of the tensions between two systems of economic organisation prevalent in most industrialised economies. The first operates on a so-called *market system* in which individuals and groups are left free to pursue their own welfare goals. In this system, the market is only subject to basic and, in most cases, generic restraints underpinned through instruments of private law. In this system state rules for behaviour plays a minimal role. In the second system – the *collectivist system* – the state seeks to direct or encourage behaviour which would occur without such intervention with the aim of correcting perceived deficiencies of the *market system* and meeting collective or public interest goals.[146]

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[143] Baldwin, R., *et al., Understanding Regulation,* (2nd edn, OUP 2012), pp. *19*
[144] Stewart, R., 'Regulation and the Crisis of Legalisation in the United States' in Daintith, T., (ed), '*Law as an Instrument of Economic Policy: Comparative and Critical Approaches'* (W. de Gruyter 1988) 15
[145] Majone, G., *Deregulation or Re-regulation? Regulatory Reform in Europe and the United States (1990), pp -12*
[146] Ogus, A., *Op. Cit., 12, pp. 2*

That said, regulation exhibits a range of characteristic features which differentiate it from typical law which underpins the market system. *Ogus* identified three of such features. First, regulation contains the idea of control utilised by the state to compel individuals to behave in particular ways with threat of sanction for non-compliance. *Baldwin* echoes this view in his 'three-way horizontal taxonomy' for conceptualising regulation. Accordingly, he argued that regulation comprises a specific set of commands, a direct form of state intervention, marked by the promulgation of binding legal rules.[147] Focus is not on the executor, but on the 'commands' which ought to be executed. Secondly, regulation is a form of public law meant to be enforced by the state or its agents and cannot be undermined by private parties. The third feature is that, because the state plays a central role in the formulation and enforcement of regulation, it is typically centralised.

In contrast, private law which typically underpins systems under the market model primarily aims at facilitating private welfare goals. Private law does this by offering a set of formalised arrangements with which individual market participants can promote and safeguard their "welfare-seeking" activities and relationships.[148] In this sense, such private legal arrangements are inbuilt with mutual rights and obligations which are enforceable by the courts. However, the operative difference between law in a market system from regulation in the collectivist system is that, in the former, it is left to individuals to enforce rights resulting from voluntarily incurred obligations. In the latter, however, enforcement is strictly a matter for the state.

Agreed, as argued by *Ellickson,* the above discussion is an over-simplified of approaching the nature of law in the economy which in reality is much more complex and multi-faceted.[149] In reality, it is impossible to view the economic system either solely privately-run with decentralised and facilitative law or entirely public, centralised and control-based. In many modern economies, there is often a dynamic interplay of state control and

[147] Baldwin, R., *et. al., Op. Cit.*, 15
[148] Ogus, A., *Op. Cit., 12, pp. 2*
[149] Ellickson, R., 'A Critique of Economic and Sociological Theories of Social Control' (1987) Vol. 16, *Journal of Legal Studies,* pp. 67

private arrangements for the attainment of both private welfare and collective goals. The relevance of this conversation to cryptocurrency is that, in trying to figure out how best to design legal or regulatory response, it is necessary to understand the implication of each model i.e., legal private arrangements and centralised control. Adopting either method of legal or regulatory response will undoubtedly determine what objectives can be targeted and which models would be best. The next section will explore in more depth the different theories of regulation, identifying the sets of objectives which drive either model of regulatory or legal design.

3.3 THEORIES OF REGULATION

As mentioned earlier, categorising regulation as direct state intervention in a collectivist economic systems is theoretically useful for several reasons. It aids in identifying what the collective goals of regulation in any particular sector should be. But more importantly, theoretical analysis provides a framework for assessing whether those objectives can be met in both *market* and *collectivist* economic systems. In the context of cryptocurrency, this discussion is essential in potentially identifying the sorts of objectives ideal for shaping legal or regulatory intervention.

3.3.1 Public Interest Theory

Public interest theory of regulation is the most orthodoxly held justification for regulation as direct government intervention. It is the idea that regulation is generally designed for the protection and advancement of public interests.[150] But more specifically, according to public interest theory, regulation is only to be justified as a corrective measure to perceived deficiencies in the operation of the market.[151] Before considering the arguments of this theory in detail, let us first consider its origins. Although discussions on 'public interest' appears in academic literature from law, politics and economics disciplines, its origins are actually rooted in case-law rather than academic scholarship. [152]

[150] Domas, H., 'The Public Interest Theory Of Regulation: Non-Existent Or Misrepresentation?' (2003)15, *Eur. J. Law. Econ.,* pp. 165
[151] Ogus, A., *Op. Cit., 12, pp. 15*
[152] Held, V., '*The Public Interest and Individual Interest'* (Basic Books, 1970) 32

In America, 'public interest' considerations first received judicial mention in 1877 in the *Munn v. Illinois case*[153] where the US Supreme Court affirmed the constitutionality of extending state 'regulation' to private industries whose activities were proven to affect 'public interests'. By so doing, the Court upheld the power of government to apply typical public sector rules on private entities. In England, however, the notion of state intervention in private markets was not as popular, at least in the eighteenth century, because it supposedly ran contrary to *laissez-faire* which had become engrained into common law as a form of restraint on government interference into private business.[154] Probably the first judicial reference to public interest was in relation to 'public utilities' rules, being the crux of controversy in the old case of *Allnutt v. Inglis (1810).*[155] The case involved the exercise of monopoly pricing with the authority of a parliamentary licence. A private firm involved in providing wharf, crane and other related shipping services had received a Monopoly Charter by the British Parliament. The plaintiff had refused to pay the 'high' prices for services, claiming prices were not in the public interest. In its decision, the court agreed that although the private company operated as licensed monopoly, they were still required to fix prices which reflected the "public interest." This decision implied that private entities providing public service were expected to set respective price rates in the public interest. In contemporary times, references to 'public interests' can be easily found in Acts of Parliament or judicial decisions.

An example is the Public Interest Disclosure Act of 1998 (PIDA) which protects workers who make qualifying protective disclosures. An amendment to PIDA 1998 introduced in s. 17 of the Enterprise and Regulatory Act 2013, however, narrows the definition of 'protected disclosure' to those made in the 'public interest.' The combined effect of both is therefore the creation of a 'public interest' test to ascertain whether a 'protective disclosure' qualifies as made in public interest. Another example is the 'public interest' test set up in the Freedom of Information Act 2000 (FOIA) which gives rights of public access to information held by public authorities subject to 'absolute' and 'qualified'

[153] *Munn v. Illinois,* 94 U.S. 113 (1877)
[154] Burdick, C., 'The Origins Of The Peculiar Duties of Public Service Companies' (1911) 11(8), *Columbia Law Rev.,* pp. 743-764
[155] *Allnut v. Inglis,* 12 East 530 (1810)

exemptions. According to s. 2, a public authority is barred from giving the public access to pieces of information which are 'absolutely exempted' from the purview of the Act. However, if the exemption is 'qualified', the public authority must weigh the public interest in maintaining the exemption against disclosure.

Perhaps the most plausible argument in support of the 'public interest' focus of regulation can be gleaned from the statutory powers of the Bank of England. Consider s. 4(3) of the Bank of England Act 1946 which empowers the BoE, "if it thinks necessary in the public interest" to request information from bankers or issue directions to any banker in respect of ensuring that effect is given to such request for information. Described as the "moral powers of persuasion", the BoE uses powers such as these to influence and control the behaviour of commercial banks, which some argue, aid the evolution of flexible bank supervision.[156]

The redistribution of rights for 'public interests' as an ethical basis for regulation may appear reasonable and straightforward. It is, however, not without flaws. Firstly, the concept is extremely vague and difficult to define. In applying this criticism to the *Allnutt* case, for example, calls to question the idea of regulating price in 'public interest' by balancing society's interest against excessive gains by traders. Unfortunately, this cannot exclusively be described as 'public interest' because surely the same 'balancing act' could be equally applicable to similar situations where services rendered are not public in nature. Another criticism is the theoretical focus on regulation which enables benevolent government agents to act in the public interest. It assumes that regulatory agencies tasked with implementing regulation will always be trustworthy and focused solely on pursuing such public interests without any intervening or competing interests.[157] It also assumes the existence of an implementing agency with objective knowledge to ascertain the presence of 'market failures' and respond with the appropriate regulatory instrument.[158] The argument takes for granted that pursuit of 'public interest' within the context of

[156] Milman, D., '*Regulating Enterprise: Law and Business Organisation in the UK' (Bloomsbury Publishing, 1999)*119
[157] McLean, I., 'The Political Economy of Regulations: Interests, Ideology, Voters and the UK Regulation of Railways Act 1844' (1992) *70, Public Admin.,* 313 - 319
[158] Baldwin, R., Cave, M., and Lodge, M., *Understanding Regulation,* (2nd edn OUP 2012) 41

bureaucracy will most certainly have to grapple with balancing vested political interests and other considerations, such as regulatory costs or enforcement issues, which potentially reduce focus. Fundamentally, the 'public interest' theory assumes the existence of a clear and indisputable vision of what amounts to the 'public interest' and fails to consider the tensions between how competing groups perceive public interest.[159]

As has been demonstrated, this theory is fraught with problems ranging from the definition of 'public interest', the capability of regulatory agencies to objectively pursue these interests, compliance-related issues and competing but valid considerations in assessing regulatory arbitrage.[160] Despite its shortcomings, proponents continue to defend the 'public interest' theory and argue that it aids in maintaining a normative basis for setting reasonable and idealistic societal goals worth pursuing.[161]

The above discussions on statutory references to 'public interest' are indicative of one major problem – it is futile to attempt a formulation of an inexhaustive list of all public interest goals which should inform state intervention in either a *collectivist* or *market-led* economic system. This problem is underscored by the fact that what constitutes 'public interest' will always vary according to time, place and values held by any particular society.[162] The implication for our analysis of cryptocurrency is therefore that, while public interest in one economy may require the pursuit of one goal such as financial inclusion for instance, it may require a totally different set of goals in others. Case in point, a developing economy where payment transactions are heavily cash-based and vast percentages of the population are underbanked, the goal of state intervention into cryptocurrency, for instance, could justifiably be the promotion of financial inclusion. On the other hand, a developed economy may not find cryptocurrency as particularly useful in this regard. Hence a divergence of what amounts to public interest in each case.

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[159] Francis, J., *The Politics of Regulation: A Comparative Perspective* (OUP 1993), 8

[160] Alfon, I., 'Cost-Benefit Analysis and Compliance Culture' (1997) *Journal of Financial Regulation and Compliance*

[161] Oliver, J., 'Regulation Inside Government: Public Interest Justifications And Regulatory Failures' (2000) 78 *Public Administration*. Available at <https://onlinelibrary.wiley.com/doi/pdf/10.1111/1467-9299.00208> accessed 13 March 2019

[162] Friedrich, J., (ed), *The Public Interest* (1962)

That said, the next section will nevertheless examine some of the major goals which public interest theory often seeks to promote. These goals will be discussed in two categories – economic and non-economic goals.

3.3.1.1 Economic Goals

As discussed in our chapter on monetary theories, economic thinking often focuses on the attainment of market efficiency – where resources and financial instruments can be put to their most valuable use for maximum economic benefits. Economic theories often assume, as was observed in relation to market systems, that efficiency is guaranteed when there is minimal restrictions which inhibit market players from pursing their welfare goals. As *Ogus* points out, "in the real world in many sets of circumstances these assumptions are not fulfilled – in short, there is 'market failure'.[163] Instances of market failure are often cited as justification for direct state intervention through the use of regulatory instruments, either because private law cannot always provide an effective solution or, in times of crisis such as the global financial melt-down, high profile accounting scandals expose instances of malfeasance by self-interested private entities.[164] More consideration will be given to some of the economic goals often cited as justification for government intervention with markets.

A. Monopoly, Competition and Anti-Trust Law

The general assumption of the market system model is that healthy competition invariably improves market efficiency. Drawing from the perspective of the Chicago School of thought,[165]*Bork* made the same case that markets are most efficient when competition thrives and ultimately leads to the advancement of consumer welfare.[166] But this idea is not as clear as one may imagine, especially because two distinct notions can proceed from this proposition. The assumption implicit within this view is that market efficiency always

[163] Ogus, A., *Op. Cit., 12, pp. 129*

[164] Clarke, M., *Regulating the City: Competition, Scandal and Reform* (Open University Press) pp. 3

[165] The Chicago School was a neo-classical economic school of thought which promoted the virtues of a market-free economic system as being valuable for society. The main tenets of their philosophy was that minimal or no government intervention in the market is always best for economic prosperity.

[166] Often referred to as the father of American Anti-Trust law, Robert Bork in his book '*The Anti-Trust Paradox'* argued for the recalibration of American anti-trust law. His views eventually formed part of most US Supreme Court decisions. On the question of what objectives anti-trust law must pursue, Bork framed the issues in his article 'Legislative Intent and the Policy of the Sherman Act' (1966) Vol. 9, *Journal of Law and Economics,* pp. 7

leads to satisfied consumers. But this is only an assumption because it not entirely clear, at least from major proponents, what the goal of regulatory intervention should be. The dilemma here is that, if the assumption is correct, by aiming at improving market efficiency, regulation will always invariably achieve better consumer welfare. But the reality is that, as will be demonstrated, it is debatable that market efficiency alone can deliver better consumer welfare. Put differently, consumer satisfaction is not always achieved when markets are said to be most efficient. In any case, what does it mean to have a fully efficient market? However, this question is answered, the policymaker will often be saddled with deciding whether to focus on achieving better consumer welfare, improving market efficiency, or perhaps pursuing both objectives.

Let us now consider in some detail how regulation aims at monopoly and competition. As mentioned earlier, proponents of both the collectivist and market system models are often likely to argue that market always out to be reinforced rather than overreached. However, the controversy often revolves around what role law or policy should play in attaining this ultimate objective. For the collectivists, law should essentially correct bad behaviour which affects consumers' welfare while, for the market system, law should be used to resolve private issues in relation to rights and liabilities which arise from commercial obligations. Bork rightly observed that the controversy of what values should control the application and evolution and application of law remains central.[167]

The crux of the contention is whether market practices such as monopoly, virtual integration or pricing are harmful to the market and therefore avoidable through law. To understand the debates here, it is instructive to first discuss what it means. The prevalence of monopoly is often presented, by some, as one instance that leads to market failure. Monopoly is said to occur when a specific person or enterprise becomes an exclusive supplier of a commodity or service to the market.[168] Monopoly is said to lead to inefficient markets characterised by negative outcomes, particularly to consumers. As such, by encouraging anti-competitive behaviour, monopoly stifles competition in the production

[167] *Ibid.*
[168] Simshauser, P., 'Monopoly Regulation, Discontinuity & Stranded Assets' (2017) 66, *Energy Economics,* pp. 348 - 398

of goods and services; resulting in a lack of viable alternative goods or services; increasing chances of high prices; and promotes the entrenchment of substantial barriers which restrict market entry by other potential suppliers.[169]

The existence of monopoly within an economic sector, whether concerned with a single firm or collusion of firms, it is argued, shrinks market space and occasion abuses of market power. To counter the emergence of monopoly and avoid market inefficiency which arises as a consequence, proponents would argue for the deployment of regulation or other anti-trust legislation.[170] Such anti-trust legislations can be broadly framed to encompass an array of prohibitions, either broad or narrow.[171] Again, it is not always clear what values underpin regulatory or statutory intervention.

These forms of intervention to counter anti-competitive practices arguably aim at creating business environments that are more conducive for competition to thrive. However, there is an ongoing debate as to whether a market efficiency is the best approach to promoting consumer welfare, especially in relation to legal interventions.

But do such antitrust laws effectively address the concerns raised by monopoly? It is debatable whether such legal instruments exclusively achieve the desired results of spurring competition and market activity. Even by its theory, economists acknowledge and concede that strengthening competition is not always in the best interest of the market. As it relates to the use of regulation, economists argue that a different type of monopoly – natural monopoly – often require a somewhat different response. Natural monopolies which occur when the economies of scale available in the production process are so enormous that the relevant market can only be served at the least cost by a single firm.[172] Hence, competition in such instances becomes ultimately harmful to the market.

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[169] Friedman, M., *Capitalism and Freedom,* (40th Anniversary edn, University of Chicago Press 2002) 208
[170] Carsensen, P., 'Antitrust Law, Competition, and the Macroeconomy' (1981)14, *Univ. of Mich J. of Law Reform*, pp. 173-201
[171] Campbell, N., 'The Role of Monopoly Laws In The International Trading System' (1995) 167, *Int. T.L.R.*, pp. 349
[172] Baldwin, R., Cave, M. and Lodge, M., *Understanding Regulation* (2nd edn, OUP 2012) 17

In the context of finance, a natural monopolistic producer of money will produce a smaller output than will a competitive producer hence devoting fewer resources to production, freeing up resources for the production of nonmonetary commodities.[173] As far as the production of money is concerned, economists would argue that the market would be better off with natural monopoly since resources that would have gone into the competitive production of money are now free to be utilized in the production of non-money capital which will, in turn, increase the total flow of services available to the community. To ensure control of such monopolistic entities, however, economists advocate the use of government regulation rather than competition laws because restoration of competition may be socially costly. This proposition, however, raises the problem of government regulating its money-making monopoly.

The proposition that regulation is an apt response to natural monopoly is problematic on different fronts. Firstly, the terminology of 'natural monopoly' remains somewhat ambiguous and devoid of clarity beyond its standard definition. This is underscored by imprecise economic debates on causes of natural monopolies and rationale for regulation, i.e., to curtail the abuse of market power by government-approved monopolies.

Different theories explaining the different rationale for regulation, either to protect public/community interests or enhance the group/private interests rather adds a level of complexity to understanding the interplay of monopoly and regulation. This imprecision is further reinforced by the fact that economic regulation is currently applied to industries that do not necessarily possess the 'natural monopoly' rationale of large economies of scale but covers 'non-utility' industries underpinned by competition such as electronic commerce and banking.

Equally problematic is a range of issues pertaining to the relevance of law, either as anti-trust law or government regulation, in curtailing monopoly. First, while basic economic theory regarding the negative effects of monopoly is already well established, translating

[173] Pesek, B. and Savin, T., *Money, Wealth, and Economic Theory* (1968: New York, Macmillan Company) 71

this theory into an ideal set of legal rules is rather difficult because of a resultant difficulty in monitoring price and cost performance. Similarly, competitive market activities are not as unambiguous as economic theories portray them. As such, it is debatable whether legal rules can adequately or expertly differentiate market activities which are anti-competitive from those which are not, especially given that economic theory for distinguishing such activities is far from settled. In any case, the plurality of legal systems such as the different common law and civil code approaches present a unique problem in explaining the capacity of law to deal with such anti-competition across an increasingly globalized marketplace effectively.

These challenges suggest the difficulty and perhaps impracticability of translating economic theories of monopoly into coherent and effective legal frameworks simultaneously applicable across different jurisdictions, markets and sectors. In relation to currency and monetary operations, it is undeniable that governments around the world, including the UK, are not particularly comfortable with private competition against national currencies. In this regard, governments exercise some measure of monopoly when it comes to issuing money and controlling the payments system. Cryptocurrencies technology challenges this monopoly power. But this monopoly power is also held by many of the traditional institutions, representing a public-finance franchise arrangement where the sovereign public acts as franchisor, licensing private financial institutions in dispensing public resources. These private and public institutions are all saddled with entrenched roles in the payments system. These institutions, sometimes referred to as systemically important financial institutions (SIFIs), perform different significant roles within the hierarchy that is the financial system. In some respects, such financial institutions possess significant monopoly powers.[174]

Consequently, such companies may have the freedom to set high transactional fees, provide poor services or take advantage of consumers by, for instance, infringing into customers' payments data. Antitrust laws and government regulation have so far not successfully dealt with monopoly and its consequences on consumers. I would, therefore,

[174] Hockett, R., and Omarova, S., 'The Finance Franchise' (2017) 102, *Cornell L. Rev.* pp. 1143

argue that cryptocurrency present a different approach to spurring competition in payment systems. Do cryptocurrency break the monopolies within the payments system? Yes, its distributed ledger and decentralisation entails that crypto-systems are not centrally controlled. Unlike traditional payment systems, most cryptocurrency have no owner and is governed by computer protocols. In this respect, cryptocurrency provide competition and can have the effect of fostering improved service delivery.

In relation to potentially designing appropriate regulatory frameworks for cryptocurrency, it is pertinent to settle the question of which underpinning value should control any such regulatory intervention. One could certainly argue, as Bork did, that introducing competition into monetary questions such as currency issuance might spur market efficiency and lead to consumer satisfaction. To reach such a conclusion, it would have to be convincingly demonstrated that the existing monetary system[175] underserves consumers and to the extent to which a privately issued cryptocurrency can drive up efficiency and guarantee consumer satisfaction. In this regard, critical questions about the value of state monopoly in currency issuance ought to be closely examined to ascertain whether, indeed, consumers are better served by maintaining the existing system.

The alternative argument in relation to efficiency made by others contends that market efficiency alone does not always guarantee enhanced consumer welfare, especially when it concerns market players that have engaged in monopolising practices that makes such entities too politically powerful.[176] Proponents of this argument are more often sceptical of big business, and, in this line of thinking, economic power translates into political power, which is ultimately bad for democracy. There are more akin to argue that regulation should focus more on competition practices such as vertical integration or price manipulations which deliver benefits for market entities but not always for consumers. Furthermore, the business models of new online platforms, for instance, Khan argues, defy and complicate assumptions embedded in the current understanding of competition and

[175] This existing system often described as a state controlled system where private actors participate as franchise partners of the state. In this modern monetary system, different participants including state and non-state actors have some role in issuing and controlling money.
[176] Khan, L., 'Amazon's Anti-Trust Paradox' (2017), Vol. 126(3), *Yale Law School Journal,* pp. 710

market efficiency. Specifically, these business models create incentives for companies to pursue growth at the expense of profits, and how online markets and control over data may enable new forms of anticompetitive activity. Most of these new business models are two-sided, bringing together everyday users and fee paying advertisers. As such, although there is maximum efficiency in such markets, consumers are not necessarily best served by the fact of exposures to predatory pricing tactics, sale of private data to advertising companies and potentially undermining of social fabrics of society such as targeted political advertising.

I would argue here therefore that whichever fundamental value is preferred is dependent upon a few factors. One would have to consider the impact state currency monopoly on consumer satisfaction, and whether any alternatives are available to escape potential undesirable consequences of monopoly abuse.

B. Information Asymmetry and Consumer protection

Economists argue that an effective and competitive market can only properly be sustained if consumers have sufficient information on services offered to evaluate existing market competition properly.[177] Informational considerations have long been known to determine not only the degree of competition but also the pricing and profitability in payments services. Furthermore, it is argued that several factors exist within the market, which makes access to such information problematic. Hence creating information asymmetries. For example, information may be costly to produce, those saddled with the responsibility to produce such information may be insufficiently compensated by users, or there may be low incentive to produce and disseminate such information.[178]

Equally compelling is the tendency for competitive firms to falsify information to mislead consumers. In such instances, the regulation which compels the market to make information extensively accessible, accurate and affordable may protect consumers and

[177] Hauswald, R., and Marquez, R., 'Information Technology and Financial Services Competition' (2003), 16(3), *The Review of Financial Studies,* pp. 921, 948

[178] Philip, E., and Wurster, T., 'Strategy and the New Economics of Information' (1997) *Harvard Business Review,* pp. 71,82

arguably encourage the operation of healthy competition. The intervention through regulation in such situations, it is argued, is ultimately aimed at attaining the social objectives of redistribution through the enhancement of market efficiency and competition.[179]

Certainly, even in monopolized markets where a singular firm controls the market, there is often a need to acknowledge that consumers are unfairly treated either because such detailed disclosures are not provided or consumers have significantly weaker bargaining positions. Limiting consumer protection regulation only to competitive markets fails to take cognisance of the fact other reasons may inform consumer protection regulation. For example, in markets where innovation and information technology are the primary services, such as with electronic money (e-money), there are often different sets of consideration which drive consumer protection efforts. To put this in context, consumers of e-money particularly benefit from the use of payment methods which are inexpensive, rapid, convenient, but considerably risky. Though such e-consumers may have unique regulatory concerns, so also do the market systems and structures. For this reason, it may be problematic to analyse regulation in such an industry, concerning consumer protection, as exclusively motivated by a need to enhance market efficiency.

Measuring the success of regulation by how it provides social redistribution through increasing information requirements might present some problems. For one, the proliferation of social media and recent technological progress has dramatically affected the production and availability of information, thereby changing the nature of competition in informationally sensitive markets. Within payments and financial services, information technology is having an impact on competition by improving information processing and dissemination.[180] Although this is good for competition, it can also be harmful. The general increase in information availability in the digital economy does present new challenges, particularly in relation to sharing and data harvesting. The rise of technological

[179] Stefanone, M., *et. al.,* 'Information Asymmetry and Social Exchange: Exploring Compliance Gaining Online' (2015) 18(4), *Information, Communication & Society,* pp. 236-389

[180] Hauswald, R., and Marquez, R., 'Information Technology and Financial Services Competition' (2003), 16(3), *The Review of Financial Studies,* pp. 921, 948

tools has transformed how information is gathered and shared. This has some implications for competition, but more importantly, it has serious implications for privacy and personal liberties of consumers. The Customer Analytics strategies utilised by Amazon, for instance, are a good example of how profit-driven entities use sophisticated processes and tools to understand how users engage with their products and services.[181] A panorama investigation which delved into Amazon's data practices reveals how the company uses advanced technologies to gather consumer data which it uses for targeted advertising or predicting behaviour.[182] To be considered as effective, regulation in this modern era of technological innovation will have to provide increased protection to consumers.

An alternative analysis of consumer regulation, especially about emerging markets as described above, is that consumer protection laws rather aim to strengthen consumer confidence which consequently improves the reliability of the products/services. As such, regulatory intervention can best be attributed to a need to ensure the subsistence and expansion of a nascent industry driven by innovation and technology. Let us consider a few examples. In 2009, the Organization for Economic Co-operation and Development (OECD) Committee on Consumer Policy (CCP) launched a review of the principles on empowering e-consumers and strengthening consumer protection in the internet economy.[183] The report resolved that consumer confidence is of paramount importance. As a result, the report identified a set of issues that policymakers may need to address to strengthen consumers' confidence in the new and emerging e-commerce payment sector. Issues such as clarity and transparency of information disclosure; fraudulent commercial practices; dispute resolution and redress; and security and interoperability were identified as a potential focus area for e-consumer regulation. Several e-money regulatory frameworks have since been patterned to address the particular issues identified by the report. Majorly, e-money regulatory frameworks often focus on, as it relates to consumers, making e-money infrastructure secure enough to prevent interceptions, and protect

[181] Amazon, 'What are Customer Analytics?' available at <https://aws.amazon.com/pinpoint/customer-engagement/customer-analytics/> accessed 23 January 2020

[182] BBC Panorama, 'Amazon: What They Know About Us' (17 February 2020) retrieved from <https://www.bbc.co.uk/iplayer/episode/m000fjdz/panorama-amazon-what-they-know-about-us> accessed 23 February 2020

[183] OECD Policy Roundtables: Competition and Payment Systems Report (2012). See < http://www.oecd.org/competitio/PaymentSystems2012.pdf> Accessed 13 July 2017

transactions between parties from risks of cybercrimes and privacy invasion.[184] As the internet becomes an indispensable phenomenon within the modern economy, several other consumer-related issues, beyond ensuring more competition and effective markets, require regulatory intervention to improve market confidence especially in respect to the potential for systemic failure.

3.3.1.2Non-Economic Goals

In addition to the economic goals which arguably underpin the public interest theory of regulation, proponents often identify a range of other non-economic goals which are as important in shaping regulatory intervention for public interest. We identify and discuss a few of these here.

A. Distributional Justice, Fairness and Equality.

As discussed above, the economic goal of efficiency is often directed to the maximisation of consumer welfare. However, it is not concerned with how that welfare is distributed between different people and groups, except in instances where a small group with access to resources can utilise their economic leverage to, in some limited way, affect or eliminate inequalities which enhance welfare.[185] In this regard, regulation could also be designed to achieve non-economic objectives which ultimately align with public interests by, for instance, targeting the fair or just distribution of resources.

Before examining the nature of distributional justice claims on regulation, let us first consider the different ideas justifying the distribution of justice in relation to regulation. Liberal schools of thought, especially of libertarians and socialist, contend that 'just' and 'fair' distribution of resources is justifiable depending on a range of different factors. For example, Nozick points out in his 'theory of entitlement', that distribution is justifiable only where everyone who acquires a holding does so in accordance with the principle of justice (such as with inheritance).[186] It amounts to an infringement of personal liberty for

[184] Degbhan, F., and Haghighi, A., 'E-Money Regulation For Consumer Protection' (2015) 57(6), *Int. J.L.M.,* 610-620

[185] Ogus, A., *Op. Cit., 12, pp. 46*

[186] Nozick, R., *Anarchy, State and Utopia* (Basic Books 1974), pp. 151-163 available at < https://antilogicalism.files.wordpress.com/2018/04/anarchy-state-utopia.pdf> accessed 21 November 2020

the state to intervene with the just holdings of a person on the guise of attempting resource redistribution. Other than focusing on the just acquisition processes, exponents of other liberal thoughts tend to be more concerned with societal outcomes of equality constituting justifiable grounds for resource redistribution.[187]

From the perspective of public interest regulation, it is often centrally argued that resource distributions which result from market processes are not necessarily fair or just. As *Okun* observed,

> such is the double standard of a capitalist democracy, professing and pursuing an egalitarian political and social system and simultaneously generating gaping disparities in economic well-being. This mixture of equality and inequality sometimes smacks of inconsistency and even insincerity.[188]

In this sense, regulation must directly or indirectly aim at preventing market-led resource distribution which concentrate market power only in those who can came the market system and create social inequalities. Regulatory intervention will be indirect when, for instance, the policymaker justifies intervention on any other ground such as market failure. But in some instances, regulatory intervention will more specifically and directly be designed to achieve redistribution goals such as the reduction of income inequality.

The main controversy among proponents of this theory of regulatory intervention is often on determining what handicaps should be subject of interventionist measures and where major trade-offs are required.[189] So, although there might be broad consensus that there should be no market discrimination based on race or gender or that access to financial services should not depend on wealth, it is unclear whether regulation should specifically compensate differences in natural abilities or poverty. Another problem to resolve is often which trade-offs should be made between market efficiency and equality. *Ogus* argues that the answer must depend on ideology for whereas libertarians would prefer never to

[187] George, V. and Wilding, P., *Ideology and Social Welfare* (London, Wheatsheaf 1994) pp. 63
[188] Okun, A., *Equality and Efficiency: The Big Tradeoffs* (1975
[189] *Ibid*.

sacrifice market efficiency, others would rather argue that justice should be given priority.[190]

While I agree that political ideology does play a significant role in determining how the balance between efficiency and inequality is struck, when the subject matter of regulation is disruptive new technology, attention ought to not exclusively focus on market efficiency or equality. Broader social values of democracy and liberty ought to play a significant role in how the policymaker designs regulatory intervention, going forward. For instance, debates regarding the regulation of social media giant, Facebook. In designing regulatory intervention into digital payment operations, especially as it relates to cryptocurrency, the policymaker might have to make an assessment of the totality of existing payment systems operate and impact upon market efficiency, consumer welfare, distributional justice and broader democratic values. This assessment will no doubt differ from one society to the next, depending on similar issues of how state monopoly in currency is used within the context of democracy and liberty. Ogus is therefore right to argue that political ideology shapes which trade-offs are made between market efficiency and distributional justice. But this ideology must also take into consideration broader realities present in society and how cryptocurrency may aid in altering the dynamics of market power, access and equality.

3.3.2 Private Interest Theory

As demonstrated earlier on, the public interest explanations of regulation has often been accepted as the orthodoxy by lawyers and judges. These have filtered through several judicial cases and statutes in public law such as in judicial review. Challenging the view that regulation is motivated by a need to redistribute rights or achieve economic efficiency for collective public interests, another ideological position began to emerge in the 1970s. These ideological positions, the private interest theory, insist that there were questions as to control and accountability which pervaded self-regulation practices and incessant

[190] Ogus, A., *Op. Cit., 12, pp. 50*

reluctance of courts and public agencies to intervene in the market, often relying on self-regulation.[191]

This theory is closely associated with '*the economic theory of regulation'* which builds on the assumption that all actors within the economy are inherently self-regarding and therefore always ultimately seek to maximise their respective interests.[192] One prominent argument within this economic theory is the idea of 'regulatory capture' developed by *George Stigler* which argues that the state deploys its enormous machinery of power to benefit or hurt a vast number of industries selectively.

Furthermore, though regulation may be actively sought by industry or thrust upon it by the state, regulations are ultimately the acquisition of industry. To this end, it is argued that a regulated industry will always have an incentive to influence regulation, either by influencing implementation or by intervening in the regulatory crafting processes of the policymaker. By taking hold of the processes, the industry captures regulation.

However, it is problematic to blame regulatory capture as the singular explanation for private interest as the motivation for regulation. Given that capture describes scenarios where industry influences regulatory enforcement, it may well be plausible to use capture for explaining the failure of regulatory agencies. Reference to industry influence in explanations for failure is however not new, albeit often articulated differently. A similar explanation is articulated as the 'revolving door' idea to describe situations where regulators, being former top executives of industry firms, come from the industry and therefore have their first loyalties to the industry rather than to goals of regulation. This argument has its roots in political science and is based on the notion that regulatory agencies go through a 'life cycle' that sees the public interest progressively subordinated to interests of the regulated industry.[193] As a result, the 'revolving door' has become an

[191] Page, A., "Self-Regulation: The Constitutional Dimension" (1986) Vol. 49, *Modern Law Review,* pp. 107-111
[192] Peltzman, S., 'Towards a More General Theory of Regulation' (1976)19, *J. Law Econ.,* pp. 211
[193] Bernstein, M., '*Regulating Business by Independent Commission,* (Princeton University Press 1955)

influential concept in debates about why regulatory agencies persistently fail to enforce the law against business offenders.[194]

The 'revolving door' hinges on the idea that regulation is homogeneous and somewhat organic because it has observable patterns of development, especially concerning regulatory actors. As such, regulators and inspectors overtime become increasingly sympathetic to the industry arguably because they look to the industry as a future career option or view their time within regulation as a training ground for a more lucrative future involvement in the industry. The adverse effect of regulatory capture or the revolving door on regulatory success is still quite contentious. If agreed that the success of any regulatory regime is dependent on the achievement of regulatory goals, it must be plausible to argue that regulatory capture, of itself, has no adverse effect on regulatory success. It is often argued that regulators require certain levels of expertise on the unique concerns of the entire industry to pursue regulatory goals proficiently. It is certainly therefore debatable that regulatory success will be guaranteed if regulators are drawn from the industry itself or represent a section of the industry. This line of argument, at best, can only be akin to economic yardsticks of efficiency and competition, which I criticized above as an inadequate measure of regulatory success. Ultimately, advancing economic analysis of regulation poses the question of how regulatory goals are determined, whether by industry expectations or by the state.

Some would argue that the regulatory agenda must always be dependent on the peculiarities of the industry or phenomenon sought to be regulated. Financial regulation, being the subject of this thesis, has several potential objectives. One of these is protection against systemic collapse, i.e., that some sizable parts of the entire system may collapse. This is a risk which central banks, such as the Bank of England, are often concerned with and which informs its exercise of supervisory duties over the banking system.[195]

[194] Makkai, T., and Braithwaite, J., 'In and Out of the Revolving Door: Making Sense of Regulatory Capture' in Baldwin, R., *et al., A Reader on Regulation,* (OUP 1998) 173

[195] Goodhart, C., 'The Cost of Regulation' in Charles Goodhart *et.al.,* '*Financial Regulation – or Over-Regulation?'* (Institute of Economic Affairs 1988) 25

As with any aspect of the economy, industries are characterised by several groups hierarchically well-arranged. The 'powerful' actors with high material stakes occupy the apex of this hierarchy while 'less-powerful' actors congregate at the periphery with no real opportunity to influence regulatory rules. It is however the collective action of actors at the apex which, when channelled, influences regulation. In this system of competing interests, the regulator is perceived as a 'politician-regulator' mostly interested in honing its political capital and gaining re-election. When faced with the choice of amassing electoral support, the regulator or legislator will be more inclined to err on the side of collective action of actors at the apex.[196] In effect, the law is a regulatory product of a political market, produced at the intersection of the supply and demand of domestic electoral support. This is not to say that regulation never promotes the public interests or interests of actors at the periphery, but if it does, it is a coincidence.[197]

There are several areas of convergence between both theories of regulation. One of such is the assumption that law serves as a vehicle for securing collective outcomes and plays a facilitative role. Public interest theories tend to perceive 'collective outcomes' as easily ascertainable and promote collective public welfare. Conversely, private interest theories challenge the assumption that collective interests undermine public welfare. Private interest theories mostly conclude that collective interests rather promote the private interests of a select group and therefore uses the instrumentality of law for this end. This is, however, an assertion that must be proved with empirical evidence.

3.4 UNDERLYING JUSTIFICATIONS FOR REGULATING FINANCE

Having discussed the core practical goals often cited as justifications by both public and private interest theory of regulation, attention is now turned to the normative goals which practically underpin financial regulation. Analysis of financial regulation is important in the context of this thesis because, as of yet, cryptocurrency majorly operates within the realm of finance and potentially impacts upon monetary operations. To undertake this

[196] Baldwin, R., Cave, M., and Lodge, M., *Understanding Regulation,* (2nd edn, OUP 2012) 45
[197] Bronwen, M., and Yeung, K., '*An Introduction to Law and Regulation'* (Cambridge University Printing Press 2007) 43

task, this section first keenly traces the origins of government action in financial markets and critically assess the particular concerns which have driven government intervention, with particular reference to the London financial markets.

As observed earlier, the goals which often underpin most forms of regulation is often underpinned by political ideology. Upon closely observing the zeal for reform of London's financial markets, *Clerk* equally observed, for instance, the connection between government intervention and underlying political ideology.[198] This is particularly the case given that government zeal to intervene in the London Stock Exchange (LSE) began after one singular event – the 'Big Bang of 27th October 1986' – when trading protocols were transferred from a manual system to an electronic platform. Although the transition to electronic trading had considerable impacted on the state's attitude to the increasing competition, the underlying motivation for proposing regulatory reforms was majorly the political consensus at the time for de-emphasising the welfare state.[199]

It is argued that the devastation of WWII had produced a "political consensus"[200] making it the exclusive responsibility of the UK government to provide social welfare.[201] However, the economic crisis in the 1970s and 80s significantly reduced government capability to deliver on its social welfare agenda because state-provided welfare had become significantly unsustainable. The general elections were thereafter fought on debates anchored on how best to reverse Britain's economic decline. In response to the failures of the then Labour led government, new economic ideas from 'right-winged'

[198] Clarke, M., '*Regulating the City – Competition, Scandal and Reform,* (Open University Press, 1986)
[199] Goodhart, C., *et. al., Financial Regulation – or Over-Regulation?* 1988 The Institute of Economic Affairs
[200] Britain emerged from the 1939-1945 war triumphant, but economically exhausted. The 1945 Labour government built the 'post-war consensus' largely mirroring the war-time coalition government and influence of liberalism championed by William Beveridge and Keynes. The major features of the "Political Consensus" meant that governments had to accept the commitment to maintain full employment; encouraged a mixed economy with a large role for state ownership of the utilities with intervention and planning in the economy; the existence of a welfare state signalled by a national insurance system and National Health service; government's role in promoting greater equality through social engineering etc. See <http://www.bbc.co.uk/history/british/modern/thatcherism_01.shtml> Accessed 14 June 2017
[201] Loney, M., *et. al. (ed) 'The State or the Market: Politics and Welfare in Contemporary Britain'* (2nd edn, Sage 1988)

economists such as *Hayek* and *Friedman* advocated greater scope for markets and the rolling back of government's direct influence in economic affairs.

The political and ideological victory of the Conservative Party in the 1980s led by Margaret Thatcher is widely reckoned as a 'watershed' and an end of the post-war 'political consensus' because it represented a break from the principles of welfarism. A subsequent 'political consensus' and a 'new conservatism' was emerging within the Conservative Party demonstrating a "hostility" to the expanded role of state welfare. This hostility was expressed by the government in its commitments to roll-back the state and introduce a wave of economic reforms through deregulation and privatization.[202]

A more recent example of the influence of political ideology on economic policies, which some authors argue justifies the need to rethink economic organisation based on modern capitalism,[203] is the 2007/08 financial crisis. Economic downturn resulting from the GFC is often said to have contributed to erosion of public trust in political establishments to address improprieties and complacencies of private financial actors objectively.[204] The 2017 American Elections and 2016 British Referendum, often cited as evidence of growing public outrage, suggest a growing dissatisfaction with capitalism. In effect, growing social inequality fuelled by government austerity and welfare cutbacks has fuelled public outcry to redesign capitalist systems i.e., market power by increasing governments' role through social programs.[205] Whether this will, in the future, influence direct state intervention through regulation remains debatable. Suffice it to say, however, that any such state intervention deliberately designed to reduce capitalism's 'for profit motive' in response to growing public dissatisfaction can credibly be described as being motivated by political ideology.

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[202] *Ibid.*
[203] Jackson, A., and Dyson, B., *Modernizing Money: Why Our Monetary System is Broken and How It Can be Fixed* (Positive Money 2012) 130
[204] Mazzucato, M., and Jacobs, M., *'Rethinking Capitalism: Economics and Policy for Sustainable and Inclusive Growth,* (Wiley)
[205] *Ibid.*

Now that we have established that regulatory motives are rooted in political ideology, the thesis will now consider the several goals which have typically underpinned financial regulation.

3.4.1 Systemic Risk Management

Generally, systemic risks refer to the risk of a collapse of the entire financial system rather than the failure of individual firms or parts of the system. It is market failure on a large scale. It is risk of a cascading failure in the financial sector potentially caused by interlinkages within the financial system, resulting in a severe economic downturn.[206] In this regard, regulation would typically aim at preventing individual firms from failing in a manner that cascades into huge systemic crises. Preventing systemic risks therefore means that the policymaker provides certain forms of shock-absorbing measures which safeguards risk prone entities. A typical example would be the guarantee insurance scheme where bank deposits are protected up to a set amount to avoid instances of bank runs which occur in moments of crisis. For example, financial conglomerates that, before the 2007/08 crisis created social and economic stability by their activities, largely stopped financing consumer and commercial activities because of apprehensions over their solvency. This apprehension eventually led to a severe systemic collapse.[207] One example was the collapse of the largest discount house in the City of London, Overend Gurney (O&G), in 1866 after a failed venture in high-risk lending. O&G requested a bailout from the Bank of England which was refused. This created a financial panic and sent shockwaves through the entire banking system, dissipating liquidity levels. The British economy consequently went into a severe recession.[208]

It is therefore the arduous task of policymakers and regulators to limit the build-up of systemic risk, prevent and contain events which stir up financial crisis. But ultimately, the policymaker has to distinguish between events which pose systemic risks from those which are mere one-off risks. On the occurrence of the latter, unlike events of systemic

[206] http://www.systemicrisk.ac.uk/systemic-risk <Accessed 21 July 2017>
[207] Fanto, J., 'Financing Regulation Reform: Maintaining the Status Quo', (2010) 35 *Brook. J. Int'l L.,* pp. 635
[208] The Bank of England, 'The Demise of Overend Gurney', (2016) *Quarterly Bulletin Q2.* Available at < https://www.bankofengland.co.uk/quarterly-bulletin/2016/q2/the-demise-of-overend-gurney> Accessed 21 July 2017

risk which create ripple effects, one-off risk only affects a single firm or asset. Essentially, the consequences of a systemic collapse are more devastating than those occasioned by one-off risks. The challenging task of identifying crises, however, requires the building upon empirical knowledge of the way financial institutions operate and designing the appropriate responses which target the reduction of such risks and avoid regulatory responses which could instead lead to the creation of new or larger risks. This is particularly difficult given that the financial markets are vulnerable to shocks and triggers, by their very nature. Isolating and identifying events which pose systemic risks are therefore not as straightforward.

Managing systemic risk, unlike other forms of risk, require a specialized regulator – a "super-regulator" with significant powers to supervise huge financial conglomerates adequately.[209] In reality, though, the possibility of creating such a regulatory institution with enormous powers within and outside the jurisdiction is highly unlikely. Even more so if such regulator is meant to regulate a niche financial product like cryptocurrency. There is also a valid argument that regardless of how well the regulator builds up empirical knowledge of the happenings within the financial system, chances of accurately predicting risks are unlikely. The financial crisis showed that this approach to risk analysis, when used exclusively, is deeply inadequate. Financial firms and regulators alike failed to foresee the risks of asset-backed securities, the widespread illiquidity of assets and freezing up of transactions that followed the credit meltdown in the asset-backed securities market.[210] If those tasked with managing systemic risk failed to anticipate and were unprepared, it could be suggested that perhaps an extreme event in one sector can lead in unexpected ways to equally extreme consequences in other sectors.[211]

There are several regulatory strategies traditionally deployed to address the unique problems and challenges within finance. Principally, these strategies often include rule-

[209] Fanto, J., 'Financing Regulation Reform: Maintaining the Status Quo', (2010) 35 *Brook. J. Int'l L.,* pp. 635
[210] *Ibid.*
[211] Bank for International Settlements (BIS), 'BASEL Committee on Banking Supervision: Principles for sound stress testing practicing and supervision', (2009) See:< http://www.bis.org/publ/bcbs147.pdf> Accessed 22 July 2017

making, supervision, certification, and enforcement. These strategies will be considered in the following section.

A. Rule-Making and Standards Setting

Rule-making is a legislative process of setting standard rules to govern the activities and conduct of financial institutions.[212] This rule-making and standards-setting strategy often assume two distinct forms. It can either be formal, as with Acts of legislation enacted by the law-making arm of the state; or informal rules ranging from letters, guidance notes, Q&As etc. Rules may either also be made *ex-ante* or *ex-post.* The latter deals with rules which apply after the occurrence of the conduct in question whilst the former deals with rules made prior to the occurrence of the conduct. The major challenge with creating a rule or setting a standard of conduct is ascertaining what those standards will be. Deciding on what standards will be most appropriate to achieve a set regulatory objective is, no doubt, difficult especially considering the competing interests which often intervening in the process. In addition to these considerations, a decision to adopt rule-making and standards-setting requires that a regulator or policy giver takes into consideration several essential factors.

Firstly, and perhaps most importantly, the rules or standards decided upon must precisely articulate the conduct which the regulator seeks to prohibit or facilitate. Articulating conduct with sufficient precision might seem simple and straightforward in most circumstances when, for instance, the adverse conduct is already well-known to the industry. However, this straightforwardness does not apply to instances where conduct or behaviour is unpredictable. Cryptocurrencies operations are rather vulnerable to unpredictable behaviours and conduct for which rule-making would be doubtful.

[212] Pan, E., 'Understanding Financial Regulation', (2012), *Utah. L. Rev.,* pp. 1897 - 1948

B. Risk Management, Stress Testing and Supervision

It is arguable, however, that systemic risk can ever by completely anticipated, predicted and avoided. This remains the case even when the regulator has access to information with which to build data. One method for managing risks, as developed by financial regulators, is the creation of stress testing practices. Stress testing has become an important risk management tool that is used by banks and regulators as an internal risk management technique. These practices, according to the Basel II framework, require that financial supervisors ensure that such stress tests are adequately conducted. Typically, stress tests measure the resilience of financial institutions, like banks, to hypothetical adverse scenarios like severe recessions. Over time, to enhance their usefulness to policymakers, stress tests, it is argued, will potentially develop further.[213] But these stress tests are based on hypothetical scenarios. It is particularly problematic to envisage real risks by mere simulations and hypothetical scenarios adequately. This is more so in relation to revolutionary financial sectors such as cryptocurrency where data is sparse and practically uncertain.

In the context of regulating cryptocurrency, it is worth inquiring whether the traditional financial regulatory strategy of stress testing is sufficiently thorough in managing the problems of cryptocurrency. Stress test practices of regulatory agencies need to be strengthened in several areas. It has been suggested the improving stress testing will require reconsidering a few practical details. Firstly, an integration of stress testing as internal risk governance mechanisms within firms to be complemented by regulatory powers of supervision and access will significantly improve the chances of stress testing. But more importantly, increasing methods of defining test objectives, and setting yardsticks for scenario choices are critical to improving the accuracy of the stress test result and potential decisions taken from results.

[213] BoE, 'Stress testing of banks: An Introduction, (2016), *Quarterly Bulletin 2016 Q3.* Available at < https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2016/stress-testing-of-banks-an-introduction.pdf?la=en&hash=3C57129C772A42925EDABF0145129001AE7B245F> Accessed 21 July 2017

Whether these are achievable with regulation and can lend credibility to the results of tests are rather up for debate. But suffice it to say, however, that while there is room for routinely operated stress tests, they cannot and do not provide a complete picture. This is the case chiefly because mechanical approaches can neither fully take account of changing business conditions nor incorporate qualitative judgements from across the different sectors of a firm or industry.[214] This is particularly the case in relation to cryptocurrency given its ever-evolving scope. Another critical flaw with stress testing practices is that they, potentially, will not challenge internal assumptions of cost and risk and therefore, ultimately not foster internal debates and decisions to avoid risk. Not to mention that the definition of what amounts to risk can be rather subjectively different from one firm to another. Hence, allowing firms to define risk differently, thereby presenting problems for the entire system. The financial crisis is perhaps evidence that while financial activities by firms were too risky, the affected firms did not consider their activities risky enough.

The success and usefulness of stress testing are reliant on supervision. Financial supervision entails acts of monitoring, assessment and guidance performed by the regulator. Is has become an important tool in the management of systemic collapses. Another critical tool in managing risk is the practice of regulatory supervision over financial firms.

3.4.2 Consumer Protection

Until relatively recently, financial regulation has often been fundamentally driven by economic objectives of stability, efficiency and competition. Until recently, especially since the GFC, protection of retail customers has often been used as a justification for government regulation of financial products in response to perceived scandals and expanded consumer use of certain financial products.[215] As a matter of fact, 'the consumer' of financial services in the UK is a relatively new concept constructed through

[214] Bank for International Settlements (BIS), 'BASEL Committee on Banking Supervision: Principles for sound stress testing practicing and supervision', (2009) See:< http://www.bis.org/publ/bcbs147.pdf> Accessed 22 July 2017

[215] Benston, G., 'Consumer Protection as Justification for Regulating Financial-Services Firms and Products' (2000) 17, *Journal of Financial Services Research,* pp. 277, 301

commercial and legislative intervention.[216] In relation to UK payments and finance, the implicit aim of the so-called consumer protection regimes remain debatable. For some, consumer protection fundamentally advances the state's withdrawal from the provision of welfare to its citizenry.[217] For others, constructing of consumer regimes is a form of neo-liberalism where, through the enactment of regulations, governance is delivered from a distance.[218] I argue here, as it relates to finance and payments, evidence suggests that consumer protection ultimately aim at preserving economic and market interests. The protections often offered, whether in the form of compensations or notification, ultimately aim at preventing market collapse. Rarely are such protections purely and solely for the consumer.

Admittedly, consumer protection efforts within finance have been robust such as with the establishment of the Financial Ombudsman Service[219] or the resolutions to the Payment Protection Insurance (PPIs) scandals, its entire approach focuses on a perception of harm which are arguably determined by the financial regulator. The definition of harm, I would argue, is one which is mostly determined by the same economic interests which drive financial regulation. The harms which financial regulation traditionally aims to avert are those which are considered as having potential implications on competition, systemic integrity or market failure. It is never really consumer harm for consumer harm's sake. Interestingly, for instance, the overriding approach as summed up in its aims notes that the FCA:

> acts to ensure firms have their customers at the heart of how they do business, give them appropriate products and services, and put their protection above the firms' own profits or income to supports healthy competition and integrity in the financial system.[220]

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[216] Knight, D. and Tinker, T., (eds), *Financial Institutions and Social Transformations* (Macmillan 1997) 4

[217] Hodgson, D., '"Know Your Customer": Marketing, Governmentality and the "New Consumer" of Financial Services (2002) 40(4), *Management Decision,* pp. 318, 328

[218] Miller, P., and Nikolas, R., '*Governing Economic Life*, (1990) 19(1), *Economy and Society*, pp. 1-31.

[219] The Financial Ombudsman Service is an independent public body set up by Parliament to sort out complaints between financial businesses and their customers in a fair and impartial way. More on FOS is available at <https://www.financial-ombudsman.org.uk/who-we-are/governance-funding> accessed 11 March 2020

[220] FCA, 'Protecting Consumers' available at <https://www.fca.org.uk/about/protecting-consumers> accessed 10 March 2020

The point made here is that most efforts at protecting consumers of financial products target the reduction of consumer panic and losses because such 'harms' potentially trigger events in the financial system which lead to market failure and undermine systemic integrity. This approach to consumer protection is however insufficient when dealing with emerging technological innovation. Primarily, it is problematic for the policymaker to pre-determine what amounts to 'harm' which is non-existent at time of designing protection frameworks. This is particularly attributable to the implicit uncertainty of technological innovation. But more importantly, imposition of standards aimed at curbing perceived consumer harm ultimately lowers innovation efficiency and progress.[221] Also, There are a range of other consumer harms by financial institutions which, although violate consumer rights in relation to data processing, imposition of fees or determination access, are never really addressed. In any case, although regulatory intervention can provide consumers with a range of rights and protections like safety, information, or redress; consumer protection frameworks in response to innovation are often reactive, too little or too late.

3.4.3 Cashless Policy, Financial Inclusion and Cross-Border Problems.

A range of other market lapses continues to dominate discourse justifying the deployment of regulation as a form of government intervention in the economy. For instance, following the GFC, over-regulation of finance is producing certain industry trends such as a gradual shift away from cash payments towards more cashless payments. Coupled with advancements in mobile technology, deliberate government policy over the past decades has caused ushered in an era of online banking, mobile banking and contactless payments. A recent study of total UK payments from 2018 has revealed that over two-thirds of UK adults use online banking, while nearly half used mobile banking in 2018,[222] representing a rise of over 17% from the previous year. The outcome of government policy in this regard has meant that cash payments declined in 2018, falling by almost 16% to

[221] Blind, K., *et. al,* 'The Impact of Standards and Regulations on Innovation in Uncertain Markets' (2017) 46(1), *Research Policy,* pp. 249 - 264

[222] UK Finance, 'UK Payment Markets Summary 2019' (June 2019) available at < https://www.ukfinance.org.uk/sites/default/files/uploads/pdf/UK-Finance-UK-Payment-Markets-Report-2019-SUMMARY.pdf> accessed 21 January 2020

the tune of £11 Billion. UK Finance predicts that by 2028 the figure would have fallen to just 9%.[223] While cashless payments have its benefits, regulatory choices promoting cashless payments has not, I would argue, thoroughly considered whether people are ready to go cashless. The Access To Cash Review has found that approximately eight million (17%) of people say cash is an economic necessity. The report concludes that "Britain is not ready to go cashless, because digital payments do not yet work for everyone".[224]

The point made here is that the evaluation of regulation must take into consideration the impact of regulatory trends on the entirety of the population, not only a small fraction. One recommendation by the Access to Cash Review makes this point perfectly:

> Government, regulators and the industry [s]should make digital inclusion in payments a priority, ensuring that solutions are designed not just for 80%, but for 100% of society. We recommend action by government, regulators and industry to work together to solve specific consumer needs, using inclusive design approaches to ensure that the solutions designed really do meet needs. We also recommend that this remains an ongoing priority, and not a one-off activity – and work continues until digital payments really are an option for everyone.[225]

The important point raised here, particularly as it relates to the implication of regulation on society, is that regulation must provide everyone with the option to choose a payment method which best suits their needs without being excluded from specific payment activity. It should therefore be noted that the people who prefer to use cash are not necessarily unwilling or unable to use other methods of payment. The majority of them would have access to debit cards. There is definitely a diversity in the ways and reasons accounting for how different people in the UK prefer to manage their finances or conduct their day-to-day spending.

Another trend which financial regulation must take into consideration is the effect of globalisation and the internet on harmonised standards. For example, following the

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[223] *Ibid.*
[224] Access to Cash Review (March 2019) Final Report, available at < https://www.accesstocash.org.uk/media/1087/final-report-final-web.pdf> accessed on 28 January 2020
[225] *Ibid.*

introduction of a single currency to bolster the European single market idea, the European Commission enacted a 2001 Regulation to address some of the issues thrown up by cross-border trade. The practical logistics of E-payments within Euro-zone was one of issues which attracted regulatory attention. Consultations identified the lack of a competent authority to enforce mutually agreed standards, divergent statistical reporting obligations, and non-coverage of direct debit payments as barriers to the single-market vision.[226] During pre-enactment negotiations, the UK government contended that the application of the proposed EU regulation to national currencies of member-states should be predicated on an optional Opt-in basis. Given the importance of the Pound Sterling, the government thereafter decided not Opt-In, citing the adverse implication of Art. 3, which stipulate equal charges for payment transfers, on its domestic currency. Despite not exercising the Opt-In option, the UK government agreed that the FCA should be designated as the competent authority responsible for enforcement of EU Regulations.[227] This example demonstrates how practical difficulties made it necessary to fashion out a specific regulation to address a specific lapse in the market.

This is understandably the case given the historical record of economic crises experienced in many countries. Regulation has, therefore, arguably earned its place as the ultimate tool in response to changes to systems, structures, markets and practices within finance. As markets and trading practices continue to evolve, further challenges of regulatory enforcement, structures and scope will increasingly have to be surmounted. As is already evident, global financial practices and systems are undergoing tremendous ideological and practical changes, especially following the financial crisis. Retail banking operations, for example, is witnessing a vast array of these changes impacted majorly by global macro-trends[228] and cultures which drive day-to-day practices in firms.[229]

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[226] Cross-Border Payments in Euro Regulations 2010/89

[227] Explanatory Memorandum to the Cross-Border Payments in Euro Regulations 2010 available at < http://www.legislation.gov.uk/uksi/2010/89/memorandum/contents> Accessed 22 May 2017

[228] Price Water Coopers (PWC) Research, 'Retail Banking 2020: Evolution or Revolution.' See < https://www.pwc.com/gx/en/banking-capital-markets/banking-2020/assets/pwc-retail-banking-2020-evolution-or-revolution.pdf> Accessed 11 September 2017

[229] Financial Conduct Authority (FCA), 'Culture in Banking', See < https://www.fca.org.uk/publication/foi/foi4350-information-provided.pdf> Accessed 11 September 2017

As a result, it may come as no surprise to hear policymakers and politicians call for regulation as a natural response to any new phenomenon - within and beyond finance. A close look will, however, raise legitimate queries on the nature of regulation, the constituents of good regulation, the implication of regulation and, perhaps, the cost of regulation. It can be argued that legitimacy, especially regarding financial regulation, is attributable to the recent history of failed regulatory reforms and strategies which have been known to yield catastrophic results on the financial system.

3.5 FINANCIAL REGULATION AND CRYPTOCURRENCY: RESPONDING TO EMERGING AND FUTURE TECHNOLOGY

Having discussed the broad normative goals which often underpin regulation, the thesis now turns its focus to understand whether interests and objectives which underpin financial regulation are suitable enough to address the unique issues posed by emerging innovative technology, particularly broader issues like impact of monetary monopoly and cryptocurrency on democracy, personal liberties and access.

Financial regulation, much like other forms of regulation, has proven to be rather reactive.[230] New regulation often responds to crisis, shifts in market practices or other change that threatens financial stability. But ultimately, the history and principles governing systems of financial regulation, though difficult to encapsulate, are immensely influenced by economic considerations. The relevance of economic considerations in analysing financial regulation cannot be overstated. Such considerations as promoting competition, improving efficiency and protecting stability often generally underpin financial regulation.[231] Advocating for the utilisation of economic standards in framing financial regulation, economists often make the argument that efficient financial regulation must necessarily be built on a thorough knowledge of the role of economic considerations in financial markets.[232]

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[230] Whitehead, C., 'Reframing Financial Regulation', (2010) Vol. 90, *B.U.L. Rev. 1*

[231] FCA, 'About the FCA' (2016) available on < https://www.fca.org.uk/about/the-fca> accessed 21 January 2020

[232] Goodhart, C., 'The Cost of Regulation' in Charles Goodhart *et.al.,* '*Financial Regulation – or Over-Regulation?'* (1988, London: Institute of Economic Affairs) 25

Given that economic analysis of financial regulation often focuses on principal issues such as market stability or risk-taking, it is worth noting that changing economic realities, business models, financial marketplaces and practices bear considerable constraint on traditional economic analysis of regulation. Analysing financial regulation, I would argue, must take cognisance of the technological changes which foster the proliferation of innovative products and services such as cryptocurrency, electronic commerce for cross-border trade and the general convergence of international financial practices.

Unlike other forms of regulation, financial regulation fundamentally seeks to regulate financial institutions, mostly by stipulating minimum standard requirements, restrictions and guidelines. Standards setting aims at maintaining integrity of the entire system while also preventing significant systemic risks. The economic literature on financial regulation readily attributes the need to maintain financial integrity through regulation to, among others, three main factors. First, changes within the financial system which potentially threaten systemic integrity. Second, the fact that such changes occur outside the jurisdiction and control of any particular system, suggesting a transnational dimension to finance. As such, changes in financial practices or difference in regulation in one country can result in shifts in business and risk-bearing among regulatory regime of the next. The third factor revolves around the role of financial intermediation in allocating and transferring capital or in managing risk. Let us discuss these three themes a little in-depth.

Baldwin suggests the use of the term – 'ethical basis' – as underlying motives for regulation. By this description, *Baldwin* argues that common economic yardsticks such as efficiency and wealth creation, albeit important in assessing regulation, are largely insufficient to explain and rationalise regulatory fundamentals. Given this, I would argue that every instance of government intervention in the economy, especially through regulation, is fundamentally aimed at the distribution or re-distribution of rights within society. Regulation, by this argument, cannot, therefore, be understood merely by economic measurements of efficiency, wealth maximisation or monopoly reduction. The 'new conservatism' of Margaret Thatcher's post-WWI government arguably validates this argument to the extent that the government sought to re-apportion some of its traditional roles of social intervention to private entities. In many cases, regulatory provisions can be

an indication of this political/ideological undertone. Consumer regulations which are often designed to ensure product safety or protect consumers from unfair commercial practices is a case in point. A large majority of consumer regulations are often based on the principle that consumers have rights which ought to be protected from the exploitation of companies who wield larger bargaining powers.[233] The European Directive on Electricity Market,[234] which mandates member-states to take measures to protect final consumers by ensuring that "rights and obligations linked to vulnerable consumers are applied" [235] serves a good example. The Directive acknowledges the existence of certain rights and resultantly attempts to safeguard such rights.

Another example of redistributing rights through regulation is the operation of corporate governance which, for instance, aims to improve investor protection or protect shareholders' interests. In Greece where the role of weakening corporate governance structures on financial instability has been in focus, there have been increased calls for reforms to the corporate governance frameworks acknowledging the need to upgrade the liability of corporate managers and corporate gatekeepers such as accountants and lawyers in recognition of the rights of stakeholders, shareholders and investors.[236] Regulatory rules are fundamentally motivated to redistribute rights and obligations from traditional holders of such rights to new holders. But there are no straight-forward answers to questions of should benefit from such redistribution. Two broad theories have emerged to explain the interest groups which potentially benefit from the redistribution of rights through regulation, i.e., the 'public interest' and 'private interest' theories.[237] Let us briefly consider each theory.

The dominant assumption in many of the debates on innovation is that it is always a 'good thing' and a successful introduction into an applied situation of means or ends that are

[233] Waddington, L., 'Vulnerable And Confused: The Protection of "Vulnerable Consumers Under EU law' (2013) 38(6), *E. L. Rev. 757-782*
[234] Directive 2009/72 concerning common rules for the internal market in electricity.
[235] Electricity Market Directive art. 3(7)
[236] Staikouras, P., 'Corporate governance and investor protection in Greece: Regulatory and supervisory reform from a law and finance perspective' (2008)
[237] Baldwin, R., Cave, M., and Lodge, M., *Understanding Regulation,* (2nd edn, OUP 2012) 41

new to that situation.[238] The implication that innovation is always successful is critical to its current advocacy in policy circles. Even the UK Cabinet Office defines 'innovation' as 'new ideas that work' and as 'the creation and implementation of new processes, products, services and methods of delivery which result in significant improvement in outcomes, efficiency, effectiveness or quality.'[239] Admittedly, identifying whether innovation is successful or not can be quite subjective because attempts at measuring innovation have yet produced no consensus.[240] In deciding whether to adopt a facilitative or prohibitive outlook to regulating innovation, I argue that a balanced approach is adopted. Balanced approach, in this sense, would entail adopting regulatory strategies which primarily focuses on facilitating or promoting further innovation while incorporating some restraints to avert 'hyperinnovation' – where innovation prompts more innovation in an ever-ascending or descending spiral.[241] Insofar as cryptocurrencies technology is seen as an innovative technology which introduces 'new methods' and 'ideas', I make the argument that regulation needs to be approached mostly facilitatively. Although this may seem a rather simplistic approach, to start with, it is indicative of a profound character of regulation. It distinctly demonstrates that every regulatory strategy has incorporated within its make-up a set of objectives. I would, therefore, argue that measurement of the successes or failures of any regulatory strategy may be assessed by reference to the attainment of those set goals.

3.6 CONCLUSION

This chapter has critically analysed the various theories of regulation and the respective normative values used to justify regulatory intervention. The two competing theories often make the argument that regulation is justifiable for economic and non-economic reasons either in public or private interest. In relation to public interests, the on-going debate is in relation to how to balance pursing economic efficiency or distributive justice in applying regulation. While in some instances, such as in financial regulation, economic goals such

[238] Laurence, M., 'Determinants of Innovation in Organizations' (1969) 75, *Am. Pol. Sci. Rev,* pp. 111, 126
[239] Cabinet Office, *'Innovation in the Public Sector'* (2003), available at <https://webarchive.nationalarchives.gov.uk/20100407181940/http://www.cabinetoffice.gov.uk/strategy/work_areas/innovation.aspx> accessed 21 January 2020
[240] Rod, C., and Albert, R., 'A Literature Based Innovation Output Indicator' (1996) 25, *Research Policy,* pp. 403 - 413
[241] Moran, M., *The British Regulatory State: High Modernism and Hyper-Innovation,* (OUP 2003) 23

as efficiency or prevention of market failures like systemic risks are essential, economic goals are not always without negative outcomes. It is argued in this chapter therefore that in relation to emerging technologies like cryptocurrency, economic models of efficiency and competition do not always guarantee better consumer welfare. Such technologies pose new types of problems such as changing the nature of the marketplace or introducing new business models which make any emphasis on competition or efficiency insufficient to address wider consumer issues.

Although many stakeholders in finance accept that cryptocurrency could potentially deliver improved efficiency to the finance system, for others, however, cryptocurrencies are simply socially unacceptable because it represents nothing but a means of manipulating finance to facilitate crime and financial impropriety. Opinions remains divided on the innovative value of this new and emerging technology. What has become apparent to many, including financial regulators, is that potential widespread use of cryptocurrency into mainstream payments could pose significant systemic threats. If poorly managed, cryptocurrency could significantly disrupt the existing architecture of the financial system – money operations, banking-related services, transactions clearing, securities, and their respective underpinning legal frameworks etc.[242] Despite this fact, direct regulation is non-existent. This is not unexpected though given that the technology is still emerging, making it quite problematic to obtain a complete grasp of its implications. Coined by some as the so-called "pacing problem" it reflects the inability of the law to evolve and respond to technological advances at the same pace that such technology may be able to enter the market.[243] The consequence of this failure or absence of regulatory responses is that it becomes locked into a negative trajectory, potentially preventing society from harnessing its full value or empowering policymakers to regulate against unwanted problems appropriately. It is therefore imperative that regulatory frameworks be restructured so as to properly respond promptly, even though it falls outside the current regulatory scope of typical financial regulation.

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[242] The Bank of England, 'The Demise of Overend Gurney', (2016) *Quarterly Bulletin Q2. See:* http://www.bankofengland.co.uk/publications/Documents/Quarterlybulletin/2016/q2/q2pre.pdf <Accessed 21 July 2017

[243] Marchant, G., Allenby, B. and Herkert, J., (eds), *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight: The Pacing Problem* (Vol. 7, Springer Science and Business Media 2011)

The policy responses to the GFC were quite innovative. However, the insistence by policymakers to remain constrained to traditional economic considerations in regulating modern day finance may be problematic and insufficient to address the kinds of challenges faced by consumers of financial products today. For instance, in the aftermath of the GFC, financial regulation focused and prevention of systemic risks by making bail-out funds available to many struggling financial institutions. This was arguably the correct approach. However, sticking to these old economic considerations might be insufficient for building regulatory regimes which address new problems, particularly those prompted by changes to payments. Such changes may not cause systemic threats, but they invariably raise significant issues such as the declining availability of cash, challenges of pricing, or leveraging of products.[244]

Cryptocurrency potentially provide solutions to some of the emerging or future problems of finance, particularly those resulting from changing payment habits, financial inclusion, data breaches, *et cetera.* Financial regulation must, therefore, adapt to incorporate a range of new considerations into its approaches to regulating emerging technologies. This is because, for instance, the relevant evidence considered by regulators in relation to old technology only usually concerns a small range of technologies rather than the opportunity to capture value promised by new technologies. In relation to payments, past regulatory responses to old technologies such as electronic banking or e-money would be irrelevant to newer emerging technologies like cryptocurrency because of significant differences between it and the past technology.

Furthermore, emerging technologies like cryptocurrency fundamentally challenge existing terminology embedded within regulatory frameworks. Such terminologies are used to describe the regulatory scope, application and requirements. They also raise challenges of inconsistency in definitional boundaries. For example, the definition of

[244] This is the emerging practice where Bitcoin Exchanges or trading platforms offer consumers the opportunity to trade or transfer units which they do not own at the time of concluding the transaction. This operates like a credit loan system and the consumers account is often credited under the agreement of repayment at a future date, and at a fee.

"electronic money" under the EMD acknowledges the virtual nature of its representation, and yet, cryptocurrency are not considered electronic money. In considering the efficacy of existing arrangements, it is important the policymaker must undertake a careful assessment of the emerging technology, understanding its unique proposals, needs and safety challenges. Only through such careful analysis will the policymaker and regulatory regime have the capacity to manage the potential risks of emerging and future technology properly.

I would therefore argue that in building a governance framework for cryptocurrencies payments, a few non-economic and apolitical values need to be considered. The first of this is appropriate data protection rights which educates consumers to develop an understanding about their rights to data. Given that concerns over data privacy are key contributing factors that drive people to use cryptocurrency in the first place, any future regulatory design must carefully consider consumer concerns over data processing, and the increasing use of such data in sorting and profiling consumers.

Granted, other more sophisticated regime for data protection already exist, such as the General Data Protection Regulation[245] and the Data Protection Act 2018 which sets out the general data protection regime that applies to most UK businesses and organisations. However, these data protection regimes are overly broad and do not proactively address concerns in relation to the collection and use of personal data in profiling consumers or predicting consumer behaviour. Concerns such as these may not directly be in the interest of traditional financial institutions and may, as a result, be entirely overlooked.

In this regard, the challenge for the policymaker is to design regulatory regimes that choose from among different and sometimes diverging sets of policy objectives and goals.[246] While regulatory responses may increase scrutiny of emerging technology or pursue compliance targets to protect existing systems, such regulatory regimes have

[245] The General Data Protection Regulation (EU) 2016/679 (GDPR)
[246] Pan, E., 'Understanding Financial Regulation' (2010) *Utah L. Rev.,* pp. 1897

implications on socioeconomic conditions, such as consequences for competing pre-existing services, ethics and personal liberties.

The dilemma with cryptocurrencies technology is, therefore, that it remains unclear what objectives, design choices or goals should underpin a regulatory design. In addition, it is particularly difficult to regulate an emerging future technology in the present.[247] Should financial regulation continue to pursue its traditional objectives, or should it innovate and adopt a set of new goals? While this may not be a concern for all innovative technologies, it peculiarly affects cryptocurrencies technology because there is little academic attempts at providing theoretical models as mechanisms for its regulation which take socioeconomic implications into account. As *Eric* points out, developing theories on how to improve regulatory responses to innovation are crucial.[248] Therefore, I make the point that there is a need to understand the full range of regulatory choices and normative values available to the policymaker to fully appreciate the potential implications of cryptocurrencies technology.

In designing an appropriate governance framework for cryptocurrency, the policymaker must surmount several regulatory challenges which include, albeit not limited to, deciding between various design options, strategies and objectives.[249] Ultimately, though, any chosen governance framework must be appropriate, efficient and suitably incorporate a coherent set of normative values. On the one hand, the policymaker may either choose strategies that require direct state intervention and is structured around 'top-down' and 'law-based' governance approaches. Alternatively, the policymaker may choose strategies which delegate the burden of regulation onto private actors – private regulatory strategy.[250] The importance of designing an appropriate governance framework which is both efficient and suitable, I argue, is underscored by a need to acknowledge

[247] Ludlow, K., *et al.,* 'Regulating Emerging and Future Technologies in the Present' (2015) 9, *Journal of Financial Technology,* pp. 151 - 163
[248] Pan, E., *Op. Cit., 11*
[249] Scott, H., 'The Reduction of Systemic Risk in the United States Financial System' (2010) 33, *Harv. J.L.,* 671
[250] Pan, E., *Op. Cit., 11*

cryptocurrency as an innovative financial technology which introduces unique and potent solutions for resolving emerging issues within finance and payments.

While proposals for regulating cryptocurrencies are being considered by the policymaker, it is of utmost importance to consider the underlying concerns and potential consequences of regulatory strategies on stakeholders – the regulator, the market participants, the technology and the end-users. Examples of such issues are, on the one hand, critical questions of misuse which often border on criminality and financial misconducts; or the burdensome suffocation which an overbearing regulatory regime could cause on an evolving technology like cryptocurrency.[251] The consensus in this regard is that only by surmounting the challenge of 'getting regulation right' will there be a real chance of helping this technology deliver significant benefits to finance and eradicate misuse to the barest minimum. To 'get regulation right', an analysis of what amount to 'right' regulation is undertaken below, starting with conceptualisation, understanding regulatory strategies and the competing normative values which underpin financial regulation.

[251] World Economic Forum White Paper on 'Realizing the Potential of Blockchain: A multi-stakeholder Approach to the Stewardship of Blockchain and Cryptocurrencies' June 2017. < http://www3.weforum.org/docs/WEF_Realizing_Potential_Blockchain.pdf> Accessed 2 July 2017

CHAPTER IV

CRYPTOCURRENCY AND DISTRIBUTED LEDGER TECHNOLOGY: ISSUES AND CONCERNS

"Technology always empowers someone, some group in society, and it does so at a certain cost. The question must always be, therefore, what group or groups does it empower?"[1]

4.1 INTRODUCTION

Chapter III critically analysed the adequacy of regulatory goals and normative values which underpin regulation, particularly in responding to cryptocurrencies. The chapter also observed, by conducting a thorough review of theoretical explanations of regulation, that several economic and political considerations inform government intervention in the economy. However, such considerations like systemic stability, efficiency or competition, albeit useful in shaping regulatory responses, are manifestly inadequate to tackle new and emerging technological innovations. Furthermore, it was argued that in order to fully design regulatory intervention which successfully influences market behaviour, complete knowledge of the subject matter of regulation ought to be obtained.

In relation to potential cryptocurrency regulation, the chapter recommended discouraged sole reliance on 'efficiency for customer welfare' theory and, in its stead, the incorporation of other social values into regulatory considerations. Non-economic values such as protection of liberty, financial inclusion, impact on democratic values and consumer data protection are essential in responding to issues introduced by new forms of online marketplaces and business models like cryptocurrency. The chapter concluded that failure to adapt financial regulation targeted at cryptocurrency has the potential to lock emerging innovative technologies into a negative trajectory, barring the financial system from harnessing the full value of such innovations and stifling further development.

Going forward, this chapter aims at examining the nature of cryptocurrency technology,

[1] Landow, G., *Hypertext 3.0: Critical Theory and New Media in an Era of Globalisation,* (John Hopkins University Press, 2006)

exploring its innovativeness and outlining how it introduces critical alterations to the existing structure of payments. The chapter discusses the functional components of cryptocurrency technology, particularly how it operates as a medium of exchange, and identifying legal issues posed by potential adoption of cryptocurrencies. Since its creation in 2008, a multitude of companies have emerged to provide cryptocurrency-related products and services. A new emerging ecosystem of crypto exchanges, wallet-service providers, payment companies, and miners leverage this technology to create social value, spur further innovation, create jobs, and facilitate the exchange of value.

This evolving industry is creating enormous value for individuals and business. Proponents of cryptocurrency therefore believe its innovative proposals will potentially benefit society. It is gaining popularity. A 2019 study, for instance, found that the cryptocurrency industry has directly employed over 2000 people around the world, and created several other indirect employments such as researchers, analysts, traders, *et cetera*.[2] However, cryptocurrencies have created a plethora of new problems for users, traditional financial institutions, private entities striving to use the technology, and governments. More importantly, payment platforms which enable cryptocurrency payments operate rather differently from traditional payment systems. These changes pose significant challenges to our orthodox models of regulation and conceptual frameworks, both in public and private law. The challenge with understanding cryptocurrency technology are two-fold: on the one hand, not much is known by most people including regulators about the technical details of how cryptocurrencies are designed or used. This is so because the technology is still largely developing, and it is difficult to predict with complete certainty principally because of the role played by private technology developers. On the other hand, there is a '*cryptocurrency jurisdiction paradox'* to which its benefits and challenges differ from one jurisdiction to another. In reality, structured legal and regulatory responses to cryptocurrency will undoubtedly depend on the political ideologies prevalent in each jurisdiction and the extent of consumers' welfare in relation to online payments.

[2] Garrick, H., and Rauchs, M., 'Global Cryptocurrency Benchmarking Study, (Cambridge University, 2017) Available at <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf> Accessed 23 June 2019

Another problem that will be discussed in this chapter is the implication of cryptocurrency multiplicity. It is quite problematic to thoroughly engage the associated issues without tending towards broad categorisations because, although there are different types of cryptocurrencies which share similarities especially in relation to the use of encryption, there are distinctive features in each type's level of innovation and protocol functionality.[3] The dangers of not reflecting on these functional differences can have dire consequences for any analysis of legal and regulatory intervention. Legal consequences would mean that proposed frameworks will not fully appreciate the importance of practical operations and operators, thereby rendering such interventions unfit, ineffectual or, as argued in Chapter III, lock cryptocurrencies into a negative trajectory. Such unsophisticated assessment can also lead to incomplete understanding of issues, and undermine the formulation of appropriate regulatory responses. It is therefore suggested that to avoid such generalisations and the attendant risks of overly simplistic analysis, a thorough and contextualised approach, focusing on peculiar functional realities, is necessary. Such in-depth examination will deepen analytical rigour and sufficiently inform debates on regulatory innovation. By specifically focusing on the emerging cryptocurrency industry, this chapter adopts a contextualised approach in line with the recommendations of the previous chapter. The chapter provides an appropriate base of information about cryptocurrency operations as a framework upon which an analysis of existing law can be undertaken.

This chapter is structured around three main questions, namely: How do cryptocurrencies work? and what legal issues do they pose? The first section discusses the main characteristics of cryptocurrency exchange tokens and provides a thorough understanding of the agenda which its creation is designed to achieve. The second section examines the emerging ecosystem around cryptocurrency, providing an appropriate framework for understanding its payments value-chain. The third section explores the legal issues posed by cryptocurrency, particularly its benefits and challenges. In conclusion, the chapter draws on the advantages and disadvantages of cryptocurrency operations and identifies the specific issues which any future regulatory framework must address. It is argued that

[3] Garrick, H., and Rauchs, M., *Op. Cit., 2*

future cryptocurrency regulation will need to protect a range of different interests but be particularly anchored towards preserving its future development.

SECTION I

4.2 CRITICAL ISSUES: TRUST, FINANCIAL INTERMEDIATION AND DISRUPTION

Payment systems are vital to the financial system. In this regard, a safe, efficient and accessible payment system helps support financial transactions, facilitate commerce and enable the transfer of value between businesses, consumers and financial institutions.[4] Today's global payment architecture comprises of cash, cheques, credit cards, and electronic transfers which crystalises debtor-creditor relationships. Except for cash, all these payment methods are underpinned by *trust*.

Cryptocurrencies and its underlying DLT are often presented as a solution to high cost and risks associated with *trust*, especially in relation to online payments. The financial crisis preceded a collapse of the international financial markets, and impaired societies' *trust* of the modern financial and economic systems.[5] However, the current architecture of payments, including the use of digital cash issued by commercial banks, were arguably thrown into a crisis of legitimacy.[6] To understand the problem with *trust*, as often argued by cryptocurrency exponents, one must first consider the security needs in electronic environments.

The growth of the electronic commerce transactions completed over the internet has been unmitigated. One critical determinant of success for every commercial entity engaged in such online commerce sale is its payment arrangements.[7] *Trust* in digital payments tokens,

[4] Federal Reserve System, 'The 2013 Federal Reserve Payments Study', (2013) Available at < https://frbservices.org/assets/news/research/2013-fed-res-paymt-study-detailed-rpt.pdf> accessed 23 January 2020

[5] Trzcionka, M., 'The Bitcoin – Democratic Money in a Neoliberal Economy' (2018) Vol. 19, *Journal of American Studies,* pp. 155-173

[6] Flannery, M., 'Financial Crises, Payment System Problems, and Discount Window Lending' (1996) 28, *J. Money, Credit & Banking,* pp. 804

[77] Tsiakis, T., and Sthephanides, G., 'The Concept of Security and Trust in Electronic Payments' (2005) Vol. 24, *Journal of Computers and Security,* pp. 10-15

as guaranteed by payment institutions is one factor which enables transacting parties to access online marketplaces. Most theories of trust are built upon the basis that, in most traditional transactions where there is a history of exchanges between partners, human relationships supplies security and payment assurances into transactions. However, the fluid and dispersed nature of e-commerce markets make the issue of trust hard due to the fact that human contact or prior relationship is not required. This lack of interpersonal trust creates circumstances in which security mechanisms that authenticate the source of payment information and guarantee the integrity of payment information become indispensable. Such security mechanisms are provided by financial intermediaries who supply trust into online payment transactions, at a fee.

Furthermore, these traditional financial institutions serve as gatekeepers, maintaining payment ledgers of parties' balances, and importantly, guaranteeing that traditional monetary units cannot be spent twice. These financial institutions are crucial because they provide a cushion for the shortcomings of payment instruments, develop new payment technologies, and most importantly supply 'trust' to payment parties who may often have little prior knowledge of each other. However, although financial intermediation significantly enables the ease of payments, they often attract high costs in fees and charges.[8]

Unfortunately, financial intermediaries and state-actors have, as demonstrated in chapter III, recently come under severe criticism for their role in creating unreasonable risks and several crises in financial markets.[9] As such, scepticism over the monopoly of central banks on currency issuance and the high costs of financial intermediation has created doubts on the paradigm of state-supported currencies and increased debates on the viability of private currencies.[10]

[8] The recipient of a cheque is able to provide goods and services, at a distance and for large amounts, in exchange for the cheque rather than for cash. In effect, a payment facilitated with a cheque creates an interim credit. As a result, there is always a risk that a payer will not have sufficient funds to honour the cheque.

[9] Weber, B., 'Bitcoin and the Legitimacy Crisis of Money' (2016) 40, *Cambridge J. Econ, 17-41*

[10] Dong, H., 'Monetary Policy in the Digital Age' (2018) 55(2), *Finance and Development* (International Monetary Fund) 8

It is against this backdrop that Bitcoin, the first cryptocurrency exchange tokens, was created by Satoshi Nakamoto[11] as an alternative counterproposal to a 'trust-centred' monetary system. Ultimately, its major aims as articulated in the published 'whitepaper' is "propose a solution to the double-spending problem using a peer-to-peer distributed timestamp server to generate computational proof of the chronological order of transactions."[12] Accordingly, this solution would aid in avoiding high costs of financial intermediation, reducing the amount of private information collected by financial institutions, and solve the so-called double-spend problem, especially in relation to electronic payments on the internet. The outcome of this proposal was, therefore, the creation of a private currency which works as an anonymous electronic cash not issued by governments but based on computer-based encryption. Instead of so-called trusted third-party intermediaries, Bitcoin payments would rely on principles cryptographic proof by digital signatures of online users to validate online payments. In principle, Bitcoin would ensure that direct P2P online payments from one party to another are possible without the intervention of so-called trusted financial intermediaries.[13]

This disintermediated electronic payment system, it is claimed, decentralises money creation, supplants centralised trust-based systems of financial intermediation, changes how online payments are concluded, and brings people previously excluded from payments, especially in emerging economies, into a digitised and globalised online economy.[14] Also, supplanting traditional financial intermediaries will arguably eliminate high transaction fees, increase efficiency of online transactions, expand the volume of payments possible, displace of the need to harvest enormous amounts of consumers' personal data in compliance with know your customer (KUY) rules, reduce payment uncertainties, and the protect online merchants from fraud.[15]

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[11] Nakamoto, S., 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2009) available at <http://www.bitcoin.org/bitcoin.pdf> accessed 23 February 2016.
[12] *Ibid.*
[13] *Ibid.*
[14] Vigna, P., and Casey, M., *Cryptocurrency: The Future of Money?* (Vintage 2015) 4
[15] KYC has become a vital aspect of global regulatory response for the prevention of money laundering. Such rules often require financial service providers to obtain credible details of their customers.

4.2.1 Alternative to Trust and Intermediation?

Admittedly, to succeed in achieving its aims of reshaping online payment relationships, cryptocurrencies will have to overcome technological, economic, and legal hurdles. The question becomes, then, does crypto-system provide an effective alternative to existing trust-based system of intermediation which adds significant value in the economy? To be clear, cryptocurrencies are not envisaged as a credit system. It is primarily created as a payment instrument. This is not particularly the case with traditional currencies where payment functions become highly intertwined with credit. Evidently, requiring cryptocurrencies to also function as a credit instrument will be problematic. For instance, using automation and artificial intelligence for the purpose of assessing risk or credit-worthiness will be significantly biased or inaccurate because it will be based on algorithms rather than taking every applicant on its merits. As such, automation will make it ill-suited to adequately evaluate the profitability of projects for which credits can be made, equivocating the supply effects of intermediation. However, there exists a trade-off between 'usefulness' and 'vulnerability' because the more impossible credit default is, the less useful intermediation will be.[16] Supplanting intermediation and risk will arguably, therefore, produce negative consequences because risk has become an inextricable part of the modern payment system. In this regard, as long as lending and borrowing entail the moral hazard of risk, such risk cannot be mitigated without personal judgement. Admittedly, such personal judgement would be problematic, if not impossible, with blockchain's automated environment driven by an algorithm.

Admittedly, to completely supplant financial intermediation, Bitcoin's proposals will require the suspension of a significant proportion of the financial system's legal and economic framework. This is very unlikely, if not impossible, especially given that cryptocurrencies have been adjudged to pose no significant threats to overall financial stability because its total market capitalisation is only a small fraction of the entire monetary system.[17] With an overall market capitalisation at about USD 300 billion, Bitcoin, for instance, pales in comparison to the overall market worth of the entire

[16] Harwich, C., 'Currency and the Problem of Intermediation' (2016) 20(4), *Indep. Rev.,* pp. 569
[17] FCA, 'Guidance on Cryptocurrencys" Available at < https://www.fca.org.uk/publication/consultation/cp19-03.pdf> accessed on 11 March 2020

financial system, though some would argue it is an unfair comparison.[18] Given these challenges, perhaps the core innovation presented by cryptocurrencies must be restricted to its potential as a payment instrument for online transactions. In this sense, Bitcoin and other cryptocurrency exchange tokens will serve only a limited purpose, as complementing traditional payments rather than substituting them.

Challenging traditional financial intermediation systems will be daunting. To overcome this challenge, a thorough conversation about "trust" is necessary as only an appropriate legal framework which takes into consideration non-financial and apolitical considerations can address such concerns. As observed in Chapter II, money is a social instrument of credit which ultimately requires some measure of acceptance and trust. Trust is therefore essential to any payment system, and people must feel confident that a payment instrument or money will be reciprocally accepted by others. In this regard, public acceptance of any money is itself dependent on trust. Observably, traditional payment systems, especially state-issued *fiat currencies,* have had to secure public trust through a combination of state coercive powers, laws, and bilateral agreements between financial institutions. Other forms of publicly accepted monies such as commercial bank monies, albeit falling short of direct legal tender laws, have otherwise gained trust through other monetary frameworks.

Other digital and electronic monies have also attained trust and acceptability, just as traditional fiat currencies do. The Electronic Money Directive (EMD) of the European Commission, arguably provides this trust to electronic money instruments according to Art 2.[19] It is recognition of such instruments in law that give the legitimacy.

The question posed here is whether such recognition should be determined by legal provision, or whether such recognition must follow social preferences. If the suggestions

[18] Available at <https://www.theguardian.com/technology/2017/dec/19/korean-cryptocurrency-exchange-close-second-hacking-youbit> Accessed 29 March 2019

[19] Electronic Money Directive 2009/110/EC of the European Parliament defines 'E-money' as electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions and which is accepted by a natural or legal person other than the electronic money issuer.

of LTF that law plays a fundamental role in constructing financial instruments are to be taken seriously, as I suggest they should, it therefore means that law takes the lead in determining what is acceptable. I would however make the argument that, in its broader social context, law must invariably take a cue from the market. In this regard, if law does not adapt to accommodate or accord recognition to cryptocurrency exchange tokens like Bitcoins, it will not necessarily disappear. Legalisation can help bring this technology into the fold of acceptability, thereby according legitimacy. Of course, this will require a conversation taking into consideration socio-political concerns such as sovereignty of governments. These themes are picked up in a Chapter VI.

The absence of any direct legal recognition, or acknowledgement of BTC payments, especially within EU or English Law, is problematic for trust because, as a consequence, cryptocurrencies have not received widespread adoption among online retailers as once envisaged. Despite the volume of cryptocurrency transactions and price movements over the past few years, usage of tokens, particularly Bitcoin, for online purchase of goods and services has not necessarily recorded commensurate increase.[20] Indeed, much of the recent interest in Bitcoins has been because of the volatility in exchange rates against traditional fiat currencies. Resultantly, cryptocurrencies have attracted a significant number of investors and speculators interested only in holding tokens, not for their transactional aptitude, but for the likelihood of profiting from appreciating value. This suggests that cryptocurrencies do not enjoy a corresponding degree of trust that citizens have in other fiat currencies. Trust, in this context, is not targeted at whether transactions will be settled at no cost or whether payment information will be taken and shared with third-parties. Instead, it is trust of merchants that exchange value will remain stable and acceptable by other holders. This trust has not particularly benefited from the vast amount of negative press on the subject, especially in relation to its association with cybercrime, security breaches, fraud cases, and other illegal online activities.[21]

[20] Garrick, H., and Rauchs, M., *Op. Cit.,* 2
[21] Dong, H., 'Monetary Policy in the Digital Age' (2018)55(2), *Finance and Development* (IMF)

Although cryptocurrencies, particularly Bitcoin, are not currently widely accepted, its economic benefits are significantly attractive, particularly for cross-border online payments. Wider adoption cannot be ruled out in the future. In spite of claimed benefits, it is important to interrogate its broader economic, social and legal implications of the 'so-called' disruptions to the existing financial architecture, especially in regard to online payments. This is even more necessary given that, in practice, cryptocurrencies are not as 'trust-less' as are often suggested. As has been shown, the cryptocurrency ecosystem has evolved several 'bitcoin institutions' such as wallet services companies, professional miners, and exchanges, who provide different cryptocurrency services.

More importantly, to occasion a wide adoption of cryptocurrencies and shift payment culture away from account-based systems where transfer of monetary claims are recorded in accounts held with traditional financial intermediaries, the crypto-DLT payment system will have to become safer, more accessible, and efficient. Similarly, several over policies which will considerably address potential risks will be required. Whether this will invariably lead to widespread public trust and adoption remains debatable, albeit desirable.

How such a reduction is to be achieved is still subject to intensive debates. In an age of technological breakthroughs and artificial intelligence, perhaps the solution will require a combination of law, economics, and technology. Some commentators recommend a degree of "smart rules" based on "artificial intelligence" designed to mimic price-targeting policies (algorithmic central banking) will make valuation more stable. For others, supplanting existent payment architecture and replacing traditional financial intermediaries is not necessarily viable because of the valuable roles commercial and central banks play in sustaining the financial system. Instead, it is argued that a solution to BTC's incessant price volatility will require a centralized issuance of digital cash by central banks, deploying similar technologies which underpin bitcoin.

4.3 CRYPTO BASICS: HOW IT WORKS

Cryptocurrencies are created through a mathematically controlled process called "mining" which relies on "public" and "private" keys to exchange value on a peer-to-peer basis. The term is often used interchangeably with convertible, decentralised virtual currency. They also comprise of programming instructions and encryption which allows computers to broadcast messages and communicate with each other without the interference of intermediaries. As already explained in Chapter I, decentralisation and the distributed consensus inbuilt into its Distributed Ledger Technology (DLT) are crucial components of cryptocurrencies that distinguish them from those other forms of electronic payments that use intermediaries and electronic bank money, such as PayPal, WorldPay and BACS.[22] These features explains why cryptocurrencies are often described as 'trustless' because transacting parties need not have any trust in each other or in an intermediary.

The DLT is an electronic ledger of transactions not centrally held but distributed among a network of computers. Control is democratised to a network of participants who perform distinct tasks such as verifying payments through a process called "mining" based upon 'proof-of-work' (PoW)[23] incentives; and maintaining the payment ledger. By this new perspective, cryptocurrencies promise a new and arguably better form of money which offer freedom from government oversight or control, and increased inclusivity. One critical question is whether cryptocurrencies will live up to this promise, and if so, what barriers potentially stand in the way of actualising it potentials. More critically, there are other important questions in relation to what impact, if any, cryptocurrency operations will have on existing systems, practices, rules, and conventions.

In answering these questions, the traditional approach by most commentators has been to conflate the distinct, though intersecting, attributes of cryptocurrencies. For instance, most commentaries resort to referring to all cryptocurrencies as Bitcoin. Also, commentaries go further to regard cryptocurrencies as a singular phenomenon. Though not totally

[22] Fox, G., and Green, S., *Cryptocurrencies in Public and Private Law* (London: OUP 2019) pp. 2

[23] Bitcoin uses PoW as an incentive for bitcoin 'miners'. The system creates a mathematical puzzle and participants agree that whoever solves the problem first gets to create the next block. Miners have to expend computing power to solve the puzzle and receive a new BTC as reward.

untenable, characterising cryptocurrencies as a singular phenomenon can lead to unhelpful generalisations. For the purposes of this chapter, it will however be more useful and appropriate to separately discuss the distinct attributes of cryptocurrencies i.e., the currency and its underpinning technology. For ease of reference, the following section will make specific references to Bitcoin to supply context. However, it is worth mentioning, again, that there are different types of cryptocurrencies with operational differences from Bitcoin, albeit most are tailored

4.3.1 Counterproposal to Payments?

Cryptocurrencies began operating in January 2009 following the publication of the '*Bitcoin article'* in 2008 by its unidentified programmer, Satoshi Nakamoto.[24] Built on the technology of encryption, Bitcoin was principally designed as a direct replacement of traditional fiat money and will serve as an online instrument of payment. Bitcoin was designed to solve the so-called "double-spend" of electronic payments based on traditional fiat money.[25]

This double-spending problem is said to occur when a participant in a currency market can simultaneously transfer a single unit of currency to two different recipients. The internet and reproducibility of digital information are regarded as the main causes of the double-spend problem.[26] *Tapscott* describes the 'double-spend' problem in the following terms:[27]

> On the internet, people have not been able to transact or do business directly for the simple reason that money is not like other information goods and intellectual property per se. you can send

[24] Nakamoto, S., 'Bitcoin: A Peer-to-Peer Electronic Cash System', (2009), http://www.bitcoin.org/bitcoin.pdf> Accessed 23 February 2016.

[25] Electronic money (e-money) is now regulated by the E-Money Directive and defined, according to Art. 2, as "electronically stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of payments".

[26] Electronic payments are broadly online and offline. They presuppose the use of an electronic device or token to complete payment. Online payments, on the other hand, are a type of electronic payment. In many cases, online payments can be completed through a variety of ways which may or may not incorporate the use of an electronic token or device. Simply, online payments do not specifically require a physical object.

[27] Tapscott, D., and Tapscott, A., *Blockchain Revolution*, (Penguin Books, 2017)

> the same selfie to all your friends, but you ought not give your friend a dollar that you have already given to someone else. The money must leave your account and go into your friend's. It cannot exist in both places. And so, there is a risk of your spending a unit of digital currency in two places and having one of them bounce like a bad cheque.

It can, therefore, be said that Bitcoin's creation was ultimately motivated by the fact that although the orthodox payment system appears to have been fundamentally designed to eliminate the occurrence of the double-spend problem, previous electronic or virtual currencies i.e., those issued as e-money by commercial banks did not address this problem, hence bitcoin's creation. The approach of the orthodox financial system, especially in relation to double-spend, has always been to generate "trusted" payment instruments which enjoy public confidence. The trust-based payments system is a two-tiered system operated by public and private financial institutions playing distinct roles within the system. Trust is this system is generated through independent and accountable central banks, which bank reserves and private commercial banks through their asset holdings and operational rules.[28]

As a medium of exchange, the main arguments in favour of Bitcoin are typically a combination of technology, money, freedom, trust, privacy, efficiency, and accessibility. As has recently been acknowledged by the International Monetary Fund (IMF), BTC particularly holds significant promise to money operations because it allows payments at long distances, payment units are more divisible, and unlike bank account-based transactions, payments can be cleared and settled quickly without the attendant costs of financial intermediation.[29]

It is however still debatable whether bitcoin transactions are cheaper, faster, or more trust-worthy than fiat currencies. For example, transactions using fiat currencies are comparatively cheaper and faster than most cryptocurrencies, including bitcoin. Such

[28] Morten, B., 'Central Bank Cryptocurrencies' BIS available at <https://www.bis.org.publ/qtrpdf/r_qtl709f.pdf> accessed 25 January 2020

[29] Dong, H., 'Monetary Policy in the Digital Age' (2018) 55(2), *Finance and Development (International Monetary Fund)*

transactions, including cash or electronic transfers, are relatively costless and instantaneous, depending on the country. The fact that electronic transfers of cash are not instant or costless in some countries is not a reflection of the failure of money but rather more a failure of the financial technology mostly used in such countries. It can, therefore, be argued that, for such countries, a payment system based on BTC. What is more, payments based on fiat currencies have not provided an efficient and effective method for sending money between countries. For this problem, Bitcoin and other cryptocurrencies have proffered an arguably better option, especially for transfers within Europe where the Single Euro Payments Area (SEPA)[30] is proving effective and instant. However, for transfers outside Europe, transacting parties may have to use SWIFT[31], which is recognizably slower, more expensive, and insecure.

The point must, however, be made that although bitcoin transaction costs are not comparatively lower than traditional bank transfers, the bitcoin system theoretically permits the transfer of larger amounts without the attendant regulatory or additional fees traditionally charged by commercial banks.

4.3.2 Price, Value, and Volatility

Unlike traditional fiat currencies, the value of BTC is not centrally determined by any government, central authority, or individual. While the precise factors driving BTC's

Figure 1

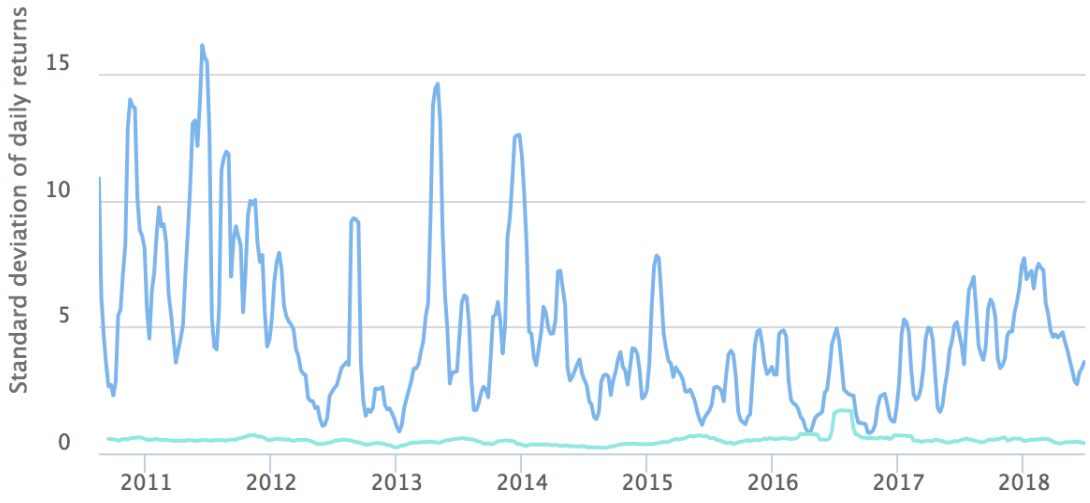
[30] SEPA is a payment-integration initiative of the European Union which establishes a single set of tools and standards that make cross-border payments in Euro as easy as domestic national payments.

[31] Society for Worldwide Interbank Financial Telecommunication (SWIFT) provides a network that enables financial institutions worldwide to send and receive information, including payments.

value remain controversial, there is a strong indication that social factors mainly influence its economy. As of today, there is no clear formula for determining the value of BTC except by reference to exchange price against traditional currencies. Unfortunately, this exchange value has experienced wild value fluctuations since 2010 when the first recorded exchange of BTC occurred.

The cause of BTC's increasing volatility has not been entirely clear. Having weathered at least six significant price adjustments since 2011, some describe BTC price volatility as a speculative bubble[32] fuelled by overoptimistic media coverage attracting waves of novice investors. Whilst some commentators believe price volatility will foretell the end of BTC,[33] others suggest that fluctuations are stress-testing the currency to evolve mechanisms which counteract volatility or derivative market activities.[34] To a large extent, the increasing activities of professional US regulated derivative and swaps market operators under the supervision of the US Commodities Fixtures and Trading Commission (CFTC), some argue, has had an impact in reducing price volatility because such markets have developed more realistic expectations about price future, thereby reducing speculations. This fact is seemingly demonstrated by historical evidence of BTC prices

Figure 2



[32] Cheah, T., and Fry, J., 'Speculative Bubbles In Bitcoin Markets? An Empirical Investigation Into The Fundamental Value Of Bitcoins' (2015) 130, *Economic Letters,* pp. 32-36

[33] Farrell, M., "Strategist Predicts End of Bitcoin", (2014) *CNN Money.* See http://money.cnn.com/2013/05/14/investing/bremmer-bitcoin/index.html Accessed 21 June 2018

[34] Gurri, A., "Bitcoins, Free Banking, and the Optional Clause," (2013), Available at <http://theumlaut.com/2013/05/06/bitcoins-free-banking-and-the-optional-clause> accessed 21 June 2018

which indicate that volatility has been trending downward over time, as shown in figure 2 below.[35]

As a medium of exchange, value and price stability plays a major role in producing trust and building confidence. This means that BTC price volatility presents a significant hurdle to BTC's legitimacy, at least as a medium of exchange, because merchants and consumers cannot guarantee the integrity of prices. The risks of volatility are two-fold. On the one hand, merchants are likely to make significant losses to their bottom-line when the value of goods and services are not stable. On the other hand, there is a significant risk that consumers will take on additional costs, either because prices constantly fluctuate or merchants deliberately charge any excesses onto prices. Ultimately, volatility continues to prevent a wider adopting of bitcoin and indeed other cryptocurrencies as their proffered store of value and medium of exchange.

4.3.3 Distributed Ledger Technology (Blockchain)

Most cryptocurrencies are underpinned by the 'distributed ledger' technology, also called "blockchain" which enables the use of algorithms in the creation of cryptocurrency on the database and shared across a network of multiple users. By allowing open access to this asset database, cryptocurrencies evolve as peer-to-peer digital cash. Cryptocurrency transactions use the blockchain as a payments processor to record, authenticate and validate transactions into blocks, each linked to predecessor transactions and added to existing chains of aggregated blocks using a cryptographic signatures. Essentially, the DLT is a recording system which, unlike recording systems used in traditional payments, is distributed to all nodes on a cryptocurrency network. This means, to a larger extent, its systems are more resilient to threats of attack or breakdown which traditional payment systems are susceptible to from time to time. As a decentralised processing system, DLTs are therefore inherently harder to attack because there are multiple shared copies of the same database, and a cyber-attack would have to attack all the copies simultaneously to be successful.

[35] Source: https://www.buybitcoinworldwide.com/volatility-index/> accessed 21 June 2018

Notwithstanding this fact, cryptocurrencies have not been entirely immune from cyber theft. Over the years there have been many reported cases, albeit most often involved theft from secondary servers of crypto-exchanges or wallet providers.[36] That notwithstanding, the distributed ledger, which is still at an early stage of development, present unique opportunities to improve information management, eliminate information asymmetry, and payments processing. The implication is therefore that the utility of DLT can extend far beyond money and payments to other public services such as tax collection, record land registries, assure supply chains of goods and generally ensure the integrity of records and services.[37]

But why is decentralisation important? Proponents of the DLT argue it is beneficial in terms of reallocating control and power from central banks to miners, developers and users themselves. Decentralisation challenges the decision-making powers of institutions at the apex of the financial system and represents a peculiar form of modern tech-driven attempts to displace political accountability in an attempt to alter economic dynamics. Although decentralisation presents some interesting economic prospects, especially in terms of transactional costs or efficiency, it however raises other fundamental socio-political questions regarding how finance and payments should be organised in the future. It makes challenging propositions, advocating the replacement of commercial banks, centralised monetary policymaking and control. But at what cost? This theme is addressed in Chapter VI.

4.3.4 Privacy, Anonymity and Pseudonymity

There is a general perception that cryptocurrencies create an anonymous digital medium of payments because it is possible to send and receive digital tokens without giving personal information. Such views often underpin assertions, as was recently made by the

[36] "$32M Stolen from Tokyo Cryptocurrency Exchange in the Latest Hack" (12 July 2019) *The Guardian.* Available at <https://www.theguardian.com/technology/2019/jul/12/tokyo-cryptocurrency-exchange-hack-bitpoint-bitcoin> accessed 29 September 2019

[37] Government Office for Science, 'Distributed Ledger Technology: Beyond Block Chain' available at < https://www.gov.uk/government/news/distributed-ledger-technology-beyond-block-chain> accessed 23 March 2019

Bank of International Settlements (BIS)[38] that cryptocurrency anonymity is a major regulatory challenge because it allows the evasion of 'know-your-customer standards' which exacerbate illicit activities such as money laundering and terrorist financing. The resultant argument is therefore often that cryptocurrencies, particularly bitcoin, are inherently dangerous as a payment token because it is almost entirely anonymous.[39] Of course, this idea is based on the observation that cryptocurrencies have no central authority with which to register user information which has led to fears that BTC transactions cannot be traced or investigated. But is bitcoin entirely anonymous and untraceable? In answer to this question, consider the following quote attributed to the inventor:

> The traditional banking model achieves a level of privacy by limiting access to information to the parties involved and the trusted third party. The necessity to announce all transactions publicly precludes this method, but privacy can still be maintained by breaking the flow of information in another place: by keeping public keys anonymous.[40]

In practice, bitcoin utilizes a combination of digital keys or nodes– a public key and a private key – to publish transactions while preserving the privacy of users. In other words, the public keys, though recorded on the blockchain, are not tied to any real-life identities. By this, cryptocurrencies operates like cash in that once a party transfers digital tokens, the sender no longer has them and there is no third-party intermediary between them who knows their respective identities. However, unlike cash, once a transaction is completed, the time it took place, the amount transferred, the IP addresses and public addresses of parties are all recorded on the distributed ledger or blockchain. Indeed, every transaction that has ever occurred in the history of the bitcoin economy is publicly viewable online on the blockchain.[41]

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[38] Morten, B., and Garratt, R., 'Central Bank Cryptocurrencies' (2017) *BIS Quarterly Review*. Available at <https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf> Accessed 21 January 2020

[39] Peter Twomey, 'Halting a Shift in the Paradigm: The Need for Bitcoin Regulation' (2013) 16, *Trinity C.L. Rev.,* pp. 67-70

[40] Nakamoto, S., 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2009), http://www.bitcoin.org/bitcoin.pdf> Accessed 23 February 2016.

[41] Brito, J., and Castillo, A., 'Bitcoin: A Primer for Policymakers', pp. 10

Some commentators resort to describing cryptocurrencies as pseudonymous because although digital tokens do not carry real identities such as names and physical addresses, transactions and holders can be identified by their public addresses. Increasingly, tying real-world identities to public addresses is not as impossible as often suggested. It is becoming possible to identify and trace such public addresses, which can provide links to computer Internet Protocol (IP) addresses and physical address of online activity. Another emerging way is the idea that a cryptocurrency user's identity can be ascertained by observing their behaviour on the blockchain. Studies investigating Bitcoin privacy have found that behaviour-based clustering techniques can reveal the profiles of almost 40% of users,[42] and advanced statistical techniques can divulge the financial activities and identities of some bitcoin users.[43] By combining IP addresses and observed behavioural patterns, cryptocurrency transactions are increasingly becoming traceable to real identities. For instance, in 2015 two US federal agents working on the Silk Road investigation were arrested for allegedly stealing a significant amount of BTC after were traced and identified through behavioural analysis and IP addresses on the blockchain network.[44]

Debates on cryptocurrency anonymity or pseudonym demonstrate the unceasing tension between protection of privacy from surveillance and national security justifications. The changing salience of online anonymity, as evidenced by the Cambridge Analytica scandal, has recently sparked concerns about, one the one hand, loss of privacy and autonomy in the face of state and corporate surveillance and, on the other hand, the creation of ungovernable spaces, the facilitation of terrorism and harassment.[45] For some, anonymity and privacy is a guarantee of social life – a way of engaging and maintaining social relationships – which produces some measure of personal satisfaction. For others, this personal satisfaction challenges the need to maintain trusted interactions. Again, questions

[42] Androulaki, E., et al, 'Evaluating User Privacy in Bitcoin' available at <http://fc13.ifca.ai/proc/1-3.pdf> accessed 23 February 2016

[43] Fergal, R., and Harrigan, M., 'An analysis of Anonymity in the Bitcoin System, 'in Security and Privacy in Social Networks, eds, Yaniv Altshuler *et al*. (New York: Springer, 2013) available at <http://arxiv.org/pdf/1107.4524v2.pdf> accessed 23 February 2016

[44] Brito, J., 'Silk Road Corruption Case Shows How Law Enforcement Uses Bitcoin,' Coin Centre, April 1, 2015 available at <https://coincenter.org/2015/04/silk-road-corruption-case-shows-how-law-enforcement-uses-bitcoin/> accessed 21 January 2016

[45] Bancroft, A., and Reid, P., 'Challenging the techno-politics of anonymity: the case of crypto market users' (2017) 20(4), *Journal of Information, Communication & Society,* pp. 497 – 512.

of national security and privacy echo the same tensions between 'big government' and society. The regulatory approaches to addressing this problem are discussed in Chapter IV, but suffice it to say that discussions about the anonymity of cryptocurrencies are often based on a wrong assumption that anonymity is prevalent on internet. In reality, internet communications have made it even more easy to be subject to surveillance. . As a matter of fact, the internet has become an arena where privacy is most infringed. What is also increasingly rampant is the fact that surveillance is no longer the exclusive preserve of governments. Commercial surveillance by profit-driven companies to gather and monetise consumer data is on the rise.[46]

Perhaps focusing on a particular innovative technology, such as cryptocurrency, and on anonymity as a singular practice can be misleading because anonymity can be broken down into different qualities that can be more suited to some activities than others. In relation to payment services, it is true that cryptocurrencies do generally enjoy a much higher level of privacy than other traditional digital payment services where parties are required to provide detailed personal information to third-party financial intermediaries. The implication for individuals is that cryptocurrency achieves significantly high degrees of security from theft, fraud, because a prospective attacker or fraudster will have to know the private key associated with a given public key in order to steal of move crypto digital assets held by such individual. However, broadly speaking, privacy and pseudonymity can potentially provide opportunistic cyber-criminals with a vital tool to commit illicit activities. This problem is not entirely unresolvable. Indeed, as will be discussed in subsequent sections, cryptocurrency transactions are not entirely disintermediated. Wallet companies, exchanges and other bitcoin intermediaries can be made to comply with similar KYC rules and collect personal data on their customers which can always be accessed when necessary. The debate required, from our discussions here, is therefore whether or not anonymity should be curtailed or preserved. This question is explored in Chapter IV.

SECTION II

[46] Froomkin, M., 'From Anonymity to identification' (2015) 1, *Journal of Self-Regulation and Regulation*, pp. 121-138; See also, Lilian Edwards (ed), *Law, Policy and The Internet* (Hart Publishing 2019) 50

4.4 FUNCTIONALITY AND PROCESSES

To understand and assess cryptocurrency – digital assets and DLT – it is necessary to understand how they works in regard to payment verification, unit creation, transactions completion, and the different actors who drive the processes. First, as a digital payment token, cryptocurrencies are computer files or a string of computer-generated codes not represented by any tangible physical object, but like any other computer file, can be lost or destroyed. For safe keeping, crypto-tokens are stored either on a personal computer or entrusted for safekeeping to online companies focused on providing digital wallet services.[47] Each token is held in its electronic wallet with a unique passcode that allows the user to either 'spend' that coin or exchange it other forms of currency.[48] In this way, bitcoin operates on the market much like any currency would.

Secondly, as an innovative technology, the DLT system monitors and records, on an ongoing basis, all payment transactions. Members of the network voluntarily perform verification tasks and are, in turn, rewarded by the system with new bitcoins. This process of transaction verification and bitcoin creation is called 'mining'.[49] To verify transactions, the decentralised system allows users to process each transaction, check how many tokens users account have received, how many have been spent, and how much can be consequently transferred. Through a system of cryptographic authentication, a transaction can only be completed once there is consensus amongst network users of the availability of funds.[50] In the absence of any central authority, transaction authentication on the network relies on user consensus for ascertaining legitimacy or otherwise of transactions. Once transactions have been accepted and transfer of tokens completed, the transaction is recorded, time-stamped, and electronically broadcasted to the entire network via the ledger.[51] In this way, it is often claimed, the cryptocurrency system is able to monitor

[47] Bollen, R., 'The Legal Status of Online Currencies: Are Bitcoins the Future?'(2013), *Journal of Banking and Finance Law and Practice,*

[48] "What is Bitcoin?", available at <http://www.coindesk.com/information/what-is-bitcoin/> accessed 22 January 2018

[49] Bradbury, D., 'The Problem with Bitcoin', (2013), Vol. 2013(11), *Comput. Fraud & Secur.*, pp. 5

[50] Paar, C., et al., "Introduction to Public-Key cryptography*"* in *Understanding Cryptography: A Textbook for Students and Practitioners,* (New York: Springer-Verlag, 2010)

[51] Brito, J., and Castillo, A., *Op. Cit., 42*

every activity without directly intervening, nor directly linking transactions to personal identity.[52]

A multitude of projects and companies have emerged to provide products and services that facilitate the use of cryptocurrency for payment uses. An ecosystem of diverse actors, some of which are incumbent financial institutions and others new disruptors now add significant value to cryptocurrencies by providing means for the public to engage with and use digital tokens within a broader online marketplace. There are four main industry sectors that enable and facilitate cryptocurrency operations – exchanges, wallets, payments, and mining. These industry sectors are becoming the new 'intermediaries' who bear varying degrees of risk and charge fees for their services. A lot of these 'intermediaries' began operations with Bitcoin and others have progressed to operate other cryptocurrencies. We will now consider these closely.

4.4.1 Exchanges

Exchanges are online platforms which provide currency exchange services, where one digital assets can be exchanged for other assets. These online platforms are used to buy, sell and trade cryptocurrencies.[53] They play an essential role in the cryptocurrency economy by offering a marketplace for liquidity, price discovery and trading.[54] It is important to note that crypto-exchanges are online platforms, and most do not have operations in physical locations across the UK. However, a limited number of exchanges provide convertibility services where customers can purchase or sell their cryptocurrencies for traditional currencies. For such service providers, it has been a challenge to fit their services within typical licencing frameworks. For instance, consider Coinbase which has over 30 million users.[55] Its primary service, described in its user contracts as "the Coinbase Service" combines "digital currency services" with "e-money

[52] Cuccuru, P., 'Beyond bitcoin: an early overview of smart contracts' (2017) 25 (3), *Int. J. Law Info. Tech.,* 179
[53] Garrick, H., and Rauchs, M., *Op. Cit., 2*
[54] *Ibid.*
[55] Coinbase is the leading Cryptocurrency service company based in California and founded in June of 2012 to provide exchange and wallet services across many jurisdictions including the UK. Available at < https://www.coinbase.com/about> accessed 12 March 2020

services." The distinction is important because, although Coinbase is licenced by the FCA to issue electronic money,[56] its digital currency services are not regulated by the FCA. Paragraph 2.2 of its User Agreement makes this explicitly clear in the following terms:

> "Unlike E-Money Services, Digital Currency Services are not regulated by the FCA. Coinbase UK is not a regulated financial services provider. Coinbase UK is based in, and provides its services from, the UK."[57]

The point made here is that exchange services are vital for the continued operation of all types of cryptocurrencies. However, it is not exactly clear how to characterise their services. Surely, they may provide a platform where asset holders may trade or exchange their assets, but they do not accept deposits in the typical sense. Nonetheless, there are hundred exchanges around the world. Recent studies have found that exchanges support trading in 42 different national currencies. The US dollar (USD) is the most widely supported currency, followed by the Euro (EUR) and the British Pound (GBP).[58] Trading Chinese Renminbi (CNY) dominate global trading volumes.

The most prominent use of exchange has been in providing platforms for trading in digital assets in the same manner as stock exchanges. As many as 138 different exchanges provide such platforms globally.[59] As far as payments are concerned, most crypto-exchanges do not necessarily provide or facilitate payment transactions with third-party online retailers. Rather, they primarily provide a portal through which people come into possession of digital assets. Recently collected data suggest that a vast number of exchange services only deal in a small number of international currencies.[60] The implication is that exchange services may not extend to cover currencies beyond the dominant currencies. To a larger extent, licencing regimes authorising exchange platforms

[56] Coinbase is listed in the FCA's Financial Services Register as CB Payments Ltd effective since 12 July 2018. Available at <https://register.fca.org.uk/ShPo_FirmDetailsPage?id=001b000003O1uMmAAJ> accessed 12 March 2020

[57] Coinbase Legal, available at < https://www.coinbase.com/legal/user_agreement> accessed 11 March 2020

[58] Garrick, H., and Rauchs, M., *Op. Cit., 2*

[59] http://coinmarketcap.com/exchanges/volume/24-hour/all/ accessed 21 March 2019

[60] Garrick, H., and Rauchs, M., *Op. Cit., 2*

to deal in national currencies differ from country to country. For instance, 85% of all exchanges based in Asia-Pacific do not operate with licenses, whereas 78% of North American-based exchanges hold formal government licenses. Significantly, only around 47% of exchanges in Europe and Latin America hold licenses.[61]

Exchanges face significant challenges – mostly regulatory, security, and operational challenges. Studies show that smaller exchanges seem to have considerable difficulty with obtaining and maintaining relationships with banks and other financial institutions. However, the highest risk to most exchanges have been shown to be security breaches that often result in loss of funds. It is now becoming apparent that exchanges continue to be targets for criminals in their handling of vast amounts of cryptocurrencies. There have been significant attacks on exchanges before. In 2014, over 850,000 BTC units, worth over $7.2 billion (USD) was stolen from Mt. Gox, a bitcoin exchange based in Japan which handled over 70% of all bitcoin transactions worldwide.[62] Security threats and losses to exchanges pose significant risks to users who, in many cases, never recover their funds.

On average, exchanges have to spend significant amounts on full-time security and overhead costs. Studies show that exchanges spend around 17% of their total budget on security, without over 70% of exchanges securing their systems with the help of external security providers. With significant amounts budgeted for operational costs and security, it is perhaps bitcoin exchanges face similar or comparable levels of fiscal pressures with traditional commercial financial institutions such as banks.[63] These costs are often charged to exchange services. The implication of the above is that although such exchange platforms exist and provide services to citizens within domestic jurisdictions such as the UK, most of such platforms are unregulated. This exposes users to significant risk. Also, for other potential companies desiring to provide exchange services, it is an uncharted territory with little or no legal guidance. Ultimately, the consequences are two-fold:

[61] *Ibid*.
[62] https://blockonomi.com/mt-gox-hack/ accessed 21 March 2017
[63] Garrick, H., and Rauchs, M., *Op. Cit., 2*

significant consumer exposure to risk and lack of guidance for further innovation in this regard.

4.4.2 Digital Wallets

As with exchange platforms, digital wallets are software programs used in storing, sending and receiving cryptocurrencies through a management of private and public keys.[64] Wallets operate like traditional bank accounts in that they provide an interface to track balances and view history of BTC transactions. In the earlier days when there were fewer cryptocurrencies designed to be held in bespoke wallets, wallet service providers were few. However, with the increasing variety of cryptocurrencies, bespoke wallets have become impracticable paving the way for further innovation to wallets. Nowadays there are many different wallet platforms which facilitate the storage of multiple cryptocurrencies. There are yet no rules in relation to service standards or requirements to get involved in designing or hosting digital wallets. In many cases, digital wallets are provided by 'volunteer companies' as stand-alone and online-based applications. But other wallet-service providers are commercially-driven, with over half located in the United States and the United Kingdom.[65] Over 85% of all wallets are provided by registered corporations with limited liability, with the other 15% provided by open-source websites.[66]

Digital wallets generally fall into two broad categories – custodial and non-custodial wallets – which can either be closed or open source. The major difference between both is the whether the wallet provider takes custody of user funds and private keys – thereby managing the key and funds – or allows users to control their own private key at the risk of losing them and not being able to recover funds. Study shows that only 15% of wallets take full custody of user funds. Wallets have evolved from simple software programs

[64] *Ibid*
[65] Garrick, H., and Rauchs, M., *Op. Cit., 2*
[66] *Ibid.*

handling key management to sophisticated applications that offer a range of features – such as 'multi-signature'[67] and 'hierarchically deterministic' (HD) key generation.[68]

Most wallets often cannot work by themselves but have to be integrated with exchange providers. Other wallets, especially those dedicated to providing services which mix traditional currencies like Coinbase, tend to have the requisite infrastructure for peer-to-peer payments. In other words, some wallets provide online checkout services allowing parties to use such wallets as payment outlets. A recent study which surveyed wallet providers found that only 27% of wallets offering national currency exchange services take custody of users' cryptocurrency funds, whilst 18% lets users decide.[69]

The operation of wallets is even more chaotic. There are no rules in relation to how to operate, or what consumers should expect. For instance, if the security of a wallet becomes compromised, there is no guidance or protection for users. Also, it remains unclear how to define the relationship between asset owners and wallet service providers. When surveyed in 2017, over 40% of wallet providers indicate they perceive no existing regulations specific to their activities.[70] Compliance requirements for cryptocurrency holding functions performed by wallets are unclear. As such, there is no clarity as to how what liabilities wallet providers have in relation to lost funds.

4.4.3 Payments Services

Although asset holders can simply exchange their tokens on the DLT in discharge of payment obligations, most users often tend to use third-party payment service providers who act like traditional intermediaries by offering a range of payment services to targeted categories of users. The services provided by these intermediaries may range from providing non-technical payment platforms, user friendly payment interfaces, additional

[67] Multi-signature is a mechanism to split access to stored cryptocurrency to two or more keys and is frequently.
[68] Hierarchically deterministic (HD) key generation allows the creation of infinite private keys off a single parent key. It removes the need for constantly backing up the wallet file once a new key has been added, as all new generated keys can be calculated using the parent key
[69] Garrick, H., and Rauchs, M., *Op. Cit., 2*
[70] *Ibid.*

features that avoid the hassle of managing keys. A majority of service providers focus on merchant services by processing payments for merchants that accept cryptocurrencies payments. Other payment service providers manage platforms for business to business (B2B) payments. A third category of service providers often provides general-purpose platforms, providing additional services such as insured accounts, and bill payment services.[71]

It is important to note that most cryptocurrency payment service providers are not as independent of the traditional financial system as often portrayed. Rather, as evidence suggests, payment companies act as gateways between business, traditional financial services, and the cryptocurrency ecosystem. Over 79% of cryptocurrency payment service providers have existing partnerships with banks, credit card companies, and mobile money networks. A good example of this is Coinbase which is licenced to provide some e-money services in addition to its core cryptocurrency dealings. Does this mean there is scope for the cryptocurrency ecosystem to operate in conjunction with traditional finance? I would argue that insofar as users cannot exclusively rely on cryptocurrencies for all their payment needs, the cryptocurrency technology will be best served when its role in traditional finance is recognised. In a survey of cryptocurrency operators, most service providers acknowledge that the difficulty in obtaining and maintaining relationships with traditional payment service providers is a challenge.[72] It is argued here that in order to achieve such recognition, the benefits of cryptocurrencies to the traditional payments system will have to clear.

4.4.4 Mining

Mining is the process by which cryptocurrency transactions are verified and added to the public ledger or blockchain. Mining plays a crucial role because it is responsible for authenticating and validating payment transactions, adding those transactions to the ledger, and providing computing power to secure the blockchain. In other words, each

[71] *ibid.*
[72] *Ibid*.

miner on the network contributes a computer's processing power toward maintaining the infrastructure needed to support the currency network. In return, the proof-of-work algorithm ensures that miners are rewarded with newly created assets.

During the early stages of cryptocurrency development, mining was predominantly simpler. A miner represented a node in the network, mostly volunteers, who individually hashed each transaction and verified their validity.[73] However, mining has grown into a highly competitive and capital-intensive industry that uses sophisticated computer hardware equipment. Furthermore, mining has created opportunities for a new type of cyber threat where hackers hijack private and public computer networks and install malicious malware for mining.[74] For example, recently the UK's Information Commissioner's Office website (ICO) along with other UK government websites were hijacked by a cryptocurrency mining malware. These activities reportedly slow down computers and can result in economic loses.[75] The potential harm to victims of this threat is higher energy bills along with accelerated device degradation, and slower system performance. Unfortunately, as with other sections of the cryptocurrency ecosystem, there is a policy vacuum in relation to how to deal with issues of mining. In other words, should there be rules in relation to who may participate in mining? It is argued here that open mining somewhat democratises finance by creating more opportunities for participation. However, there needs to be some regulatory clarification on the nature of devices used. Failing to fill this regulatory vacuum could lead to the proliferation of mining devices with attendant environmental[76] and security risks.[77]

SECTION III

[73] "What is Cryptocurrency Mining" available at <https://www.binance.vision/blockchain/what-is-cryptocurrency-mining> accessed 11 February 2020
[74] Eskandari, S., *et. al.,* 'A First Look at Browser-Based Cryptojacking' (2018) available at < https://arxiv.org/pdf/1803.02887v1.pdf> accessed 19 March 2020
[75] https://www.bbc.co.uk/news/technology-43025788
[76] Morten, B., and Garratt, R., 'Central Bank Cryptocurrencies' (2017) *BIS Quarterly Review*. Available at <https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf> Accessed 21 January 2020
[77] https://cointelegraph.com/news/bitcoin-minings-electricity-bill-is-it-worth-it

4.5 CHALLENGES AND PROBLEMS

4.5.1 Security and Criminality

As with any other technological innovations, cryptocurrencies have particularly been exploited by criminals taking advantage of its unregulated status as well as the pseudonymous nature of its transactions.[78] Although cryptocurrencies are often ascribed as an inconvenience on the financial system because of its peculiar problems, there are others who believe this is no reason in itself to abandon it as a promising economic medium.[79]This section examines these problems in closer detail, and provides insight into this impending debate on whether cryptocurrency challenges and problems should justify abandoning its potential benefits. Our discussions in this regard is divided into three broad areas of criminal activity i.e., money laundering, illicit transactions, and cybersecurity related issues.

4.5.1.1 Money Laundering

Under English Law, the provisions on money laundering are found in the Proceeds of Crime Act (PCA) 2002, particularly under s. 327, 328 and 329, The elements of the offence include concealing criminal property;[80] becoming involved in arrangements for the acquisition or use of criminal property;[81] and acquiring criminal property.[82] The implication of these provisions is therefore that money laundering is money linked with criminal activity. Generally, criminal activity is often more or less motivated by the possibility of earning monetary proceeds. Legal principles for preventing the evacuation of criminal proceeds often take different forms, one of which is money laundering. As such, money laundering is essentially the handling of criminal earnings to conceal their illegal origin so as to enable the criminal to enjoy criminal proceeds.[83]

Usually, when any criminal activity, such as illegal arms sales, smuggling, drug trafficking, generates substantial profits, the criminal suspects tend to find a way to control

[78] Brown, D., 'Cryptocurrency And Criminality: The Bitcoin Opportunity' (2016) *Police Journal*, pp. 327
[79] Fox, D., and Green, S., *Cryptocurrencies in Public and Private Law* (OUP 2019) 17
[80] PCA 2002, s. 328
[81] PCA 2002, s. 329
[82] *Ibid*
[83] http://www.fatf-gafi.org/pages/faq/moneylaundering/> accessed 21 January 2018

the funds without attracting the attention of law enforcement.[84] Criminals do this by either changing the form of funds or moving it around in order to disguise their source because such funds could constitute evidence of their crimes or be susceptible to seizure by law enforcement.[85] This processes of concealing criminal proceeds through money laundering often occurs in three stages: placement, layering and integration. Placement involves introducing illicit monies into the financial system by employing agents who spread proceeds. In layering, money is passed through multiple transactions to obscure its source. And with integration, moneys placed in the system are 'cleansed' of its criminal stain and integrated back into legitimate circulation.[86] Throughout these processes, anonymity often becomes vital in helping criminals conceal their identity and evade discovery by law enforcement. In relation to cryptocurrencies, this discussion presents two problems: to what extent can the conceptualisation of cryptocurrencies as 'money' fit into 'property' as defined by the PCA? And how might cryptocurrencies particularly facilitate money laundering?

There is a real concern that because cryptocurrencies allow for anonymous payments, they invariably become useful instruments for concealing proceeds of crimes. As such, using cryptocurrencies to buy legitimate services or goods are one way to rehabilitate criminal proceeds, especially because personal identities cannot be immediately gleaned on the blockchain which could frustrate criminal investigations.[87] Notwithstanding this fact, it is debatable whether cryptocurrencies can legally be subject to anti-money laundering provisions, such as under the PCA. Historically, money laundering statutes solely targeted organised criminals. However, more recently, rules are being expanded to also focus on institutions that receive 'dirty' money. Global Anti-Money Laundering (AML) rules generally impose reporting requirements and forfeiture provisions on financial institutions. Two issues are implicated here: treating cryptocurrencies as proceeds of crime, and fitting cryptocurrencies into AML frameworks. Only the second issue is

[84] Brown, D., 'Cryptocurrency And Criminality: The Bitcoin Opportunity' (2016) *Police Journal*, pp. 327
[85] Manual on Countering Money Laundering and the Financing of Terrorism (Asian development Bank) 2003. Available on <https://www.unodc.org/tldb/pdf/Asian-bank-guide.pdf> accessed 21 January 2018
[86] Brown, D., 'Cryptocurrency And Criminality: The Bitcoin Opportunity' (2016) *Police Journal*, pp. 327
[87] *Ibid.*

particularly important for the purposes of this section. The second issue is addressed in Chapter VII.

The first problem to address here is the idea that cryptocurrency anonymity is particularly instrumental in money laundering. In reality, however, it should be noted that cryptocurrency may be anonymous in the sense that real identities do not accompany assets. However, its transactions are not entirely untraceable as often argued. Instead, transactions in cryptocurrency are transparently recorded on the blockchain which is viewable to anyone. The implication is therefore that, even more than laundering money through cash, cryptocurrencies can become a much riskier undertaking for criminals. From the perspective of law enforcement, blockchain records can be used as evidence of criminal conduct. The challenge for law enforcements is therefore not the fact cryptocurrencies are used to launder money, but the lack of expertise in conducting effective investigations and prosecuting crimes involving cryptocurrencies.[88] In this regard, it is argued here that cryptocurrencies are not the problem per se. Rather, the UK law enforcements must improve its capacity through training and access to technological tools to investigate and prosecute criminal activity.

The second problem is in relation to whether cryptocurrencies should be treated as 'money' for the purpose of AML rules. In Chapter II it was argued that cryptocurrencies should be treated as money for the purpose of payments. In this regard, cryptocurrencies present a unique opportunity for criminals who wish to rehabilitate the proceeds of crime for making purchases. It is relatively easier to understand how cryptocurrencies may be used in this regard. The difficulty now is, for the purposes of law, whether cryptocurrencies can be subject to AML rules which deal specifically with 'money' as 'legal tender'. Given that AML rules are driven by law, the debate whether cryptocurrencies like Bitcoin can be legally categorised as 'currency' will vary from jurisdiction to jurisdiction. For instance, in the US, several statutes, regulations, and cases have made it clear that Bitcoins and other cryptocurrencies are real currencies subject to

[88] Policing Research Partnership, 'Policing Bitcoin: Investigating, Evidencing and Prosecuting Crime Involving Cryptocurrency' (29 June 2018) available at <https://n8prp.org.uk/wp-content/uploads/2018/06/N8-PRP-Small-Grants-Cryptocurrency.pdf> accessed 21 January 2020

AML laws.[89] In the UK, the rules have been fluid and unclear until as recent as 10th January 2020 when changes were introduced via the 5th EU Anti-Money Laundering Directive ('5MLD) transposed into UK Law as the Money Laundering and Terrorist Financing (Amendment Regulation) Regulation 2019. Accordingly, the scope of persons subject to anti-money laundering laws has been expanded to include, for the first time, "virtual currency exchange platforms (VCEP) and Custodian Wallet Providers (CWP)." The implication of this enlarged approach is therefore that crypto-exchanges and wallet-service providers will be mandated to comply with KYC and AML rules.

That said, AML rules such the one identified above is not directed at individual criminals but instead on the institutions that process and hold proceeds of crime. In relation to cryptocurrency transactions, VCEPs and CWPs are to be targeted. This will pose a problem in the sense that not all cryptocurrency transactions are processed through these third-party entities. In as much as wallet and exchange platforms offer vital services to the cryptocurrency ecosystem, people can decide to hold their assets in computer hard drives or other storage devices not typically operated as a wallet or exchange. For example, a user who decides to store cryptocurrencies on cloud cannot be monitored in the manner envisaged.

Another problem that arises in relation to money laundering is the question of seizures. In traditional money laundering cases, monies and other valuable properties recovered or traced to illicit activities of criminals are often subject to seizures by law enforcement. However, with cryptocurrencies, it is questionable how this would apply given the conceptual difficulties of designating assets as property or money. This legal problem surfaced in the recent UK case of *R. v Teresko*[90] where Surrey Police searched the home address of the defendant, who was subsequently convicted of drugs and money-laundering offences. The police recovered a piece of paper containing a Bitcoin recovery phrase. This phrase enabled the police to seize 295 BTC worth £975,000 at the time of seizure. Interestingly, the police did not comply with provisions of the Policing and Crimes Act

[89] Anderson, M., and Anderson, T., 'Anti-money Laundering: History and current developments', (2015) *Journal of International Banking Law and Regulation*, pp. 521
[90] [2018] Crim. L.R. 81

2009 by obtaining the permission of the Magistrates' Court before effecting the seizure. Accordingly, the police would have had to satisfy the court that seizure, defined in the Act to deal with 'property', could apply to BTC as much as to other "realisable" property. The court held that the Bitcoins recovered could be seized. It is important to bear in mind that resorting to court guidance is somewhat insufficient, especially considering that cryptocurrencies are still evolving. A case-by-case approach will not address the peculiarities of each incident.

Secondly, though the court was not approached for an appropriate seizure order, the court however granted another application permitting the police to "convert" the recovered BTC into Sterling in order to stop it suffering a loss of value resulting from volatility. It is interesting that although such novel powers are not expressly provided for in the Act, it did not stop the court from granting the application. Surely, novelty has historically never barred UK courts from developing new types of ancillary orders because of the need for flexibility to deal with new situations. But there is an international dimension to this problem. BTCs may be domiciled in a digital wallet existing in a particular device but moving BTCs from one wallet to another often require the involvement of other parties and intermediaries. For instance, if the UK law enforcement attempting to seize BTC move it from one private address to another, it would cause foreign servers to process information as they validate the transaction. This could raise concerns of territorial jurisdiction to cyberspace, and ultimately limit the powers of UK law enforcement to investigate and seize BTCs the subject of criminal activity. There is a need for an internationally harmonized legal standard in this regard, which is addressed in a subsequent chapter.

4.5.1.2 Cybercrimes and Frauds

Organised cybercrime[91] has continued to evolve since the early days of the internet. Whilst many forms of cybercrimes have become firmly established, other areas of cybercrime

[91] "Cybercrime" is a generic term used to describe crimes having the use of computer technology as its central component. In other words, any criminal act which can be carried out through the use of computer technology and perpetuated online is a cybercrime.

have reportedly witnessed an upsurge in activity, and new forms of activity have continued to evolve.[92] For instance, malware attacks aimed at harnessing computer power for bitcoin mining are becoming prominent. Online extortions and ransomwares have emerged as modern forms of cybercrimes which heavily utilize bitcoin.[93]

It is however important to distinguish the security challenges for cryptocurrency from challenges to blockchain. As a currency, it is vulnerable to a range of security breaches either by hacking into wallets which hold digital token in the same way traditional bank accounts information can be hacked from banks and other merchants through poor password or security management.[94] Over the years, there have been stories of cyber-attacks on wallet service providers. The earliest occurred June 2011 users reported losses of over 25,000 BTC[95], later that year MyBitcoin, a wallet service, disappeared from the internet due to activities of hackers.[96] In 2012 another wallet service provider, Bitcoinica, was hacked and 18,000 BTCs were stolen[97] for which users filed a lawsuit asking for recompense in "the loss of use of said monies".[98] Unfortunately, once cryptocurrency assets and units, including BTCs, are transferred cannot easily be recovered. Bitcoin is therefore highly risky for users, and service providers.

On the other hand, security breaches to the blockchain protocol have been quite rare. Understandably, the protocol is among the most secure technology in operation because it integrates well-known and vetted cryptographic tools into its core structure for which no attacks have been recorded to date.[99] Unfortunately, this does not mean that service

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[92] EUROPOL, 'Internet Organised Crime Threat Assessment Report', (2017) available at <https://www.europol.europa.eu/activities-services/main-reports/internet-organised-crime-threat-assessment-iocta-2017> accessed 21 January 2019

[93] Panthak, P., 'A Dangerous Trend of Cybercrime: Ransom Growing Challenge', (2016) 5(2), *International Journal of Advanced Research in Computer Engineering & Technology*.

[94] In 2014 Home Depot, an American home improvement supplies retailing company, was hacked and 56 million credit and debit cards details belonging to customers were stolen by malware hackers. Available at <https://www.cbsnews.com/news/56-million-accounts-at-risk-in-home-depot-hack/> accessed 21 January 2020

[95] Available at <https://arstechnica.com/tech-policy/2011/06/bitcoin-the-decentralized-virtual-currencyrisky-currency-500000-bitcoin-heist-raises-questions/> accessed 21 January 2020

[96] Available at <http://observer.com/2011/08/mybitcoin-spokesman-finally-comes-forward-what-did-you-think-we-did-after-the-hack-we-got-shitfaced/> accessed 21 January 2020

[97] https://bitcointalk.org/index.php?topic=81045.0> accessed 21 January 2020

[98] *Cartmell v. Bitcoinica* [2012] CGC-12-522983 available at <https://docs.google.com/file/d/0B_ECG6JRZs-7dTZ5QS0xcUkxQjQ/edit#> accessed 22 March 2017

[99] Britto, J., *Bitcoin: A Primer for Policymakers* (Mercatus Center) 26

providers who engage with the technology are as secure. Studies have shown that exchange and wallet service providers are increasingly targeted by cyber criminals,[100] and exchanges have at times struggled with security and in many cases, have been successfully hacked. For example, 24,000 BTC was stolen from Bitfllor in 2014,[101] 19,000 BTC was siphoned from Bitstamp exchange in 2015,[102] another 150 BTC was stolen from Coinapult in 2015.[103] In each of these cases, though the exchanges repaid or committed to repaying the full value of customers' accounts, exchanges have had to significantly boost their internal securities. In relation to payment security, breaches of security in exchanges pose problems in relation to their liability for loss and consumer protection. Although there is significant protection provided modern systems, such as deposit insurance schemes, such protections remain absent in crypto-operations. These themes are developed in the next chapter.

Unfortunately, there have been instances where exchanges and wallet service providers have proven to be fraudulent. Mt. Gox, a well-recognized Bitcoin exchange which managed over 70% of all cryptocurrency transactions in 2013, was implicated in numerous cases of fraud where it withdrew funds from customers' accounts. After filing for bankruptcy in Japan in 2014, forensic analysis of its activities revealed that one of its employees absconded with customers' assets.[104] Customers have still not been reimbursed.

Ensuring improved security and demonstrating accountability will require that service providers conduct frequent security audits to ensure their systems are protected against all kinds of threats. Though over 60% of exchanges already conduct such audits, only a handful publicly disclose the findings. Such disclosure rules, if made mandatory for exchange and wallet service providers, could improve transparency and ensure that

[100] Garrick, H., and Rauchs, M., *Op. Cit., 2*https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf Accessed 21 December 2017

[101] https://bitcoinmagazine.com/articles/bitfloor-hacked-250000-missing-1346821046/> accessed 23 June 2017

[102] https://arstechnica.com/information-technology/2015/01/bitcoin-exchange-bitstamp-claims-hack-siphoned-up-to-5-2-million/> accessed 23 June 2017

[103] https://www.ccn.com/coinapult-bitcoin-wallet-compromised-tune-43-000/> accessed 23 June 2017

[104] Available at <https://arstechnica.com/tech-policy/2017/07/feds-indict-a-leading-bitcoin-exchange-for-money-laundering/> accessed 23 June 2017

prospective users of such services are equipped with sufficient information to assess risks. Broader scoped disclosure rules could also be extended to ICO issuers as a way of safeguarding investors from investing in bad ICO offerings.

Cryptocurrency have also been used for other forms of criminality. Mostly, cryptocurrencies have been used to purchase illegal items on the online black-market websites. Though such websites are not necessarily illegal, they more serve as digital marketplaces were users can interact without revealing their IP addresses. The Silk Road, one of the first black market web sites, became notorious in early 2011 for enabling people to sell drugs and other illegal items online. One study estimates that the total monthly illegal transactions completed on Silk Road amounted to approximately $1.2 million[105] which prompted FBI to conduct an extensive investigation and an eventual shutdown.[106] More than 900,000 registered users of the site bought and sold drugs, $3.6 million USD worth of BTC at the time was confiscated.

4.5.2 Payment Solutions: Novelty, Alternative and Democracy

The originally intended purpose in creating cryptocurrencies, as indicated in *Satoshi's* Bitcoin whitepaper, was to provide "an electronic payment system based on cryptographic proof allowing any two willing parties to transact directly with each other."[107] Some argue that these cryptocurrencies have turned out to be a cure for the dysfunctions of a financial system based on neoliberal assumptions.[108] Although the launching of bitcoin itself did not have any ideological motive, given that Satoshi does not identify his project with any ideology, it appears his major aim were purely pragmatic. Bitcoin was only about transaction cost reduction through the elimination of intermediation, and saving transaction time. However, Bitcoin (and by extension, other cryptocurrencies) have grown

[105] Christin, N., Traveling the Silk Road: A Measurement Analysis of a Large Anonymous Online Marketplace, (Carnegie Mellon CyLap Technical Report, July 2012) Available at https://www.andrew.cmu.edu/user/nicolasc/publications/TR-CMU-CyLab-12-018.pdf> accessed 21 June 2018

[106] https://www.reuters.com/article/us-crime-silkroad-raid/fbi-shuts-alleged-online-drug-marketplace-silk-road-idUSBRE9910TR20131002> accessed 21 June 2018

[107] Nakamoto, S., 'Bitcoin: A Peer-to-Peer Electronic Cash System' available at <https://bitcoin.org/bitcoin.pdf> accessed 23 March 2016

[108] Trzcionka, M., 'The Bitcoin – Democratic Money in a Neoliberal Economy' (2018) Vol. 19, *Journal of American Studies,* pp. 155 - 173

as a product of liberalisation, deregulation and privatisation to the existing architecture of payments. It can therefore be argued that, as far online payments are concerned, cryptocurrency operates on the assumption that the existing payments architecture is implicitly vulnerable to abuse and manipulations by those saddled with the duty of managing the system.

This against the backdrop of government power and monopoly over money. In most modern economies, governments share power over money with central banks with tremendous scope, giving the privilege of creating money to the central bank. Throughout recent history, governments have automatically used this franchised system as a source for financing its activities. The market power of financial conglomerates combined with their potential influence have led to financialisaton of the real economy. The enormous influence and power exercised by commercial banks mean that, for instance, the banking sector has developed such an exceptional degree of creativity that controlling it has posed a real challenge to policymakers. In many cases, the complexities of the financial system and levels of dynamic innovation make regulators increasingly incapable of preventing crises. The financial crises of 2008 exposed the limited responsibilities taken by powerful commercial bank entities and the heightened appetite for efficiency and profit making. Although, only originally designed to pragmatically solve transactional cost with traditional payments, the complexity of the financial system with powerful entities held less to account arguably explains why cryptocurrency have appealed to the anarchist and libertarians ideologies.

As demonstrated in our discussions on monetary theory, the orthodox explanation today is that money creation is within the sovereign's domain. The emergence of central banking and franchised commercial bank money, though crediting and investment activity, dominate and designate the directions of economic growth. In some other isolated instances, these entities have also managed to dominate the civic space, dictating or helping to shepherd engagement in politics. Although this is certainly not the case in many developed western economies, monetary powers of the state exercised through central and commercial banks been weaponised for political end. A more recent example is the

activities of the Central Bank of Nigeria freezing the bank accounts of citizens engaged in civil protests but labelled as 'anti-state' actors by the government.[109]

Despite its credentials, cryptocurrencies still suffer a range of payment related problems which may appear as obstacles to widespread use. There are issues of bad user experience based on the limited functionality of most cryptocurrencies which are not entirely the outcome of the protocol itself, but attributable to reputational problems, market volatility, and the absence of regulation.[110] When combined, these challenges affect trust in the usability of cryptocurrencies as a legitimate medium of exchange.

The extreme volatility of cryptocurrency fuelled by market speculation[111] is currently a major payment problem because it creates difficulties for cryptocurrencies to function as money, especially as a store of value. Typically, the stability and viability of fiat currency depends to a large extent on the credit of the bank of issue and the state.[112] However, with cryptocurrencies stability depends on two factors: on their market value and on the exchange value of traditional fiat currencies. On this point, the further fact that cryptocurrencies are not backed up by real assets or by the full faith of governments further make its value highly dependent on market speculation. This volatility reduces the willingness of vendors to accept cryptocurrencies as a payment mechanism given that prices are exposed to excessive volatility.

In a recent survey of online vendors who declared they accepted Bitcoin payments, a study found that the "average value of transactions carried were 31% of sales and the factor that proved to have a strong, positive and significant impact on the fraction of sales with

[109] Munshi, N., "Nigeria Central Bank Under Scrutiny After Protest Crackdown", *Financial Times* November 2020, available at < https://www.ft.com/content/aba78069-6e7d-4454-b570-e15cd408f821> accessed 23 November 2020

[110] Gurguc, Z., and Knottenbelt, W., 'Cryptocurrencies: Overcoming Barriers To Trust and Adoption' (2018) available at <https://www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/ic3re/CRYPTOCURRENCIES--OVERCOMING-BARRIERS-TO-TRUST-AND-ADOPTION.pdf> accessed 11 March 2020

[111] Cheah, T., and Fry, J., 'Speculative bubbles in Bitcoin Markets? An Empirical Investigation Into The Fundamental Value of Bitcoins'(2015) 130, *Economic Letters,* pp. 32-36

[112] Fox, D., and Green, S., (ed), *Cryptocurrencies in Public and Private Law,* (OUP 2019) 22

Bitcoin relates to whether the company is a start-up"[113] specifically built to serve cryptocurrency market. However, with larger companies which had a wider base of customers with different payment preferences, the share of sales with Bitcoin was relatively lower. The assumption here is that knowledge and popularity of cryptocurrencies significantly contributes to the acceptability. Unfortunately, given that cryptocurrencies are an emerging innovation, the only knowledge people have of the currency is as a result of the negative news reports often resulting from its association with cybercrime. In the absence of legal certainty, this negative impression will leave potential users apprehensive.

4.5.3 Cryptocurrency and the Banking Sector

Many recognise that cryptocurrencies, by their very nature, can become a danger for the present form of the banking system, competing or complementing the traditional approach to payments by cutting costs and proposing entirely new business models.[114] The recent reports by the Bank of England and the Cryptoasset Taskforce indicate that government is keeping a keen watch on developments, as is the case with other banks across the world. One direct indication of how the bank perceive cryptocurrency can be seen in most recent actions of placing barriers which impede user activity such as blocking accounts and preventing mutual transferability between cryptocurrency and bank monies.[115] But cryptocurrencies are not entirely antithetical to the banking sector. It remains unclear how it would impact the banking sector but there are certainly many instances there banking system could potentially benefit from cryptocurrency, especially in relation to decentralisation and security issues.

Consider for instance the implications of blockchain's security protocol which do not directly expose participants' identities, as there is no trusted entity that can authenticate users. Instead, can be identified through self-generated cryptographic keys. As has been

[113] Polasik, M., *et. al.,* 'Price fluctuations and the Use of Bitcoin: An Empirical Inquiry' (2018) available at < https://www.ecb.europa.eu/pub/conferences/shared/pdf/retpaym_150604/polasik_paper.pdf> accessed 12 March 2020

[114] Trzcionka, M., *Op. Cit.,* 108

[115] Brown, G., and Wittle, R., 'Bitcoin's Threat to the Global Financial System is Probably at an End' (2020) available on < https://theconversation.com/bitcoins-threat-to-the-global-financial-system-is-probably-at-an-end-129101> accessed 12 November 2020

demonstrated already, this approach does not reliably ensure privacy but can prevent third-parties such as online advertisers from accessing users' payment information. The key question to ask, though, is whether the banking system wants this level of privacy. One concern is that it would certainly make auditing and complying with KYC rules difficult. Thus, it could be more likely that, given specific use-case scenarios, specific privacy policies will need to be utilised, if possible.

4.5.4 Conflict of Laws / Cross Border Issues

As implicated in the discussion above, legal certainty plays an important role in correcting informational asymmetries and negative externalities which impact upon reputation and acceptability of cryptocurrencies. Understandably, it is challenging to regulate the internet because, as Professors David Post and David Johnson observed, any law founded upon traditional state sovereignty and based upon notions of physical borders cannot be effective to regulate the cyberspace. This is the case because individuals may move effortlessly between geographic borders governed by different regimes in according with their personal preferences.[116] Cryptocurrency is a case in point. The entire ecosystem of cryptocurrencies, including wallet-service providers, exchanges, retailers is operationally domiciled on the internet. This raises a range of cross-jurisdictional challenges for law. Andrew Murray described this challenge aptly:

> "In the real world we design laws to protect physical goods and to control the actions of corporeal individuals. The societal move from value in atoms to value in bits therefore offers a major challenge to lawmakers as it suggests traditional legal rules require to be re-evaluated when we consider extending them into the digital environment."[117]

In addition to the challenge of regulating the cyberspace, there is also conflicts which arise from which applicable law should apply i.e., whether English courts would have competence to decide any particular case or whether English domestic law should apply

[116] Post, D., and Johnson, D., 'The Rise of Law in Cyberspace' (1996) 48, *Stanford Law Review,* pp. 1367
[117] Murray, A., *Information Technology Law,* (4th edn, OUP 2019) 55

to any given issue. In international commercial transactions, this problem is usually solved by parties stipulating in their terms of contract a 'choice of law' clause. However, with cryptocurrency payments, it would pose a significant challenge in instances where no such contractual relationship exists or where parties reside in different countries with distinct legal positions.

4.6 CONCLUSION

This chapter has outlined the nature and functionality of cryptocurrency exchange tokens, using Bitcoin as a point of reference. This chapter has also contextually discussed the innovativeness of this technology, particularly in relation to its economic benefits as a solution to the double-spend problem with online payments. The peer-to-peer blockchain has captured the imaginations of technological enthusiasts as an effective record-keeping system upon which other different applications, beyond money and payments, can be built. The democratisation of payments by allowing miners engage in transaction verification is distinct and exceptional. Potentially, such democratisation can foster inclusion by allowing vast sections of society to actively participate in the finance.

Despite its potential benefits, cryptocurrencies present some major challenges. For instance, they have been exploited by the criminal underworld. Notwithstanding this fact, many believe that cryptocurrencies have the capacity to "deliver more benefits at a lower cost and with greater ease than conventional bank products."[118] Ultimately, cryptocurrencies are an exciting innovation that have the potential to level the financial playing field by offering services to those unable to engage in financial transactions, thereby revolutionising payments and potentially improving the quality of life.

Furthermore, DLT or blockchain decentralises the cryptocurrency payments, making it possible for multiple participants to propose, validate, record and update payment details on to the ledger, which is digitally synchronised.[119] As pointed out in earlier discussions, 'distributed' here entails that the ledger is made accessible in real-time to all participants

[118] Mullan, C., *The Digital Currency Challenge* (Palgrave 2014) 131

[119] Bank of England, 'Embracing the promise of fintech' (2019) *Quarterly Bulletin (2019 Q1)* See: <https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2019/embracing-the-promise-of-fintech.pdf?la=en&hash=2445D5B3AF10096FDAA91564BB48F8E5F28486B9> Accessed 11 April 2019

on the system. This means that all payment transactions can be viewed and actioned by members of the network as those payments are being processed. But what is more interesting is how the entire system makes it possible for payments to be initiated and completed in a peer-to-peer[120] (P2P) manner, without any input from traditional financial intermediaries. Payment transactions therefore become significantly disintermediated. This innovative proposal delivers several economic benefits such as reducing transactional costs, increasing efficiency and removing the barriers which currently exist in traditional banking operations.

Clearly, decentralising payments processes as done in the cryptocurrency system bear significant differences with what obtains in the traditional payments system. Unlike with the latter where trust is provided by intermediaries who manage payments on a predicated 'transactional account' model and where payment is typically completed by continually adjusting users' account balances,[121] cryptocurrencies propose significant innovations to how payments is completed. Without question, most commentators agree that, generally, the innovation of financial processes are beneficial because they yield long-term growth, reduce inefficiencies and costs.[122] The dilemma for cryptocurrency payments in this regard is two-fold: first, will innovations proposed by cryptocurrencies be adopted into mainstream payments? And if adopted, what role should law play in facilitating an acceptance of cryptocurrencies into mainstream payments? Ancillary to both questions is nature of legal problems which the technical and practical realities of cryptocurrency payments creates on existing legal/regulatory framework for payments in the UK.

It is in view of these issues; cryptocurrencies have come to be perceived by some in the bitcoin community as 'democratic money' because it promotes the virtues of freedom and equal participation. This, in my view, is the most fundamental benefit of cryptocurrencies and it is therefore examining not only from the functional perspective traditionally used by economists, but perhaps through the prism of democratic values such as freedom,

[120] P2P here refers to computing or networking based on a distributed system which partitions tasks and workloads between equally privileged peers. are equally privileged, equipotent participants in the application. They are said to form a peer-to-peer network of nodes.
[121] Bollen, R., *The Law and Regulation of Payment Services* (Kluwer Law International, 2012), 34
[122] Romer, P., 'The Origins of Endogenous Growth'(1994) 8(1), *J.Econ. Perspect.,* pp. 3-22

sovereignty and political accountability. Due to its decentralised characteristic, particularly its settlement system that prevents interference from government or other financial institutions, cryptocurrency preserves freedom and manifests the values of direct democracy. All users have the same right to active participation regardless of gender or economic status. The fact that no one centrally controls supply, no one can dictate how funds should be spent. As such, users may decide to fund civic protests against government action or crowdfund to support particular causes.

Despite all these, a number of payment and non-payment challenges are posed by the emerging cryptocurrency industry. Problems associated with the cross-border nature of transactions; legal definition of crypto-exchanges and wallet-service providers; and payment issues such as volatility, acceptability and cryptocurrency as a black market currency. On the other hand, cryptocurrencies also pose a number of challenges in relation to criminal activities such as money laundering, cyber-attacks and trading in illicit items on the internet. The policymaker must now design or deploy existing legal tools that can tackle the diverse challenges posed by this emerging industry. The dilemma is however whether or not there are existing legal instruments which can address the above concerns or whether new regulatory regimes will need to be designed. Some, such as Dickinson, take a rather optimistic approach and argue that, despite that many issues are novel, cryptocurrencies do not necessarily require new solutions because there already exists legal devices from domestic and international law toolbox to resolve the issues.[123] However, others take the view that adapting existing rules to unfamiliar circumstances is analogous to trying to regulate the new, using the old.[124]

Having discussed how peculiar cryptocurrencies are and its potential to reshape the payments industry and well as disrupt traditional business models and governance structures, it is argued here that what is required is a careful examination of existing legal devices to ascertain the extent to which they may be adapted to cryptocurrencies. If, however, a wholly new framework will need to be designed, it will still require a

[123] Dickinson, A., "Cryptocurrencies and the Conflict of Laws" in David Fox and Sarah Green, *Cryptocurrencies in Public and Private Law,* (OUP 2019) pp. 93-137

[124] Gimigliano, G., (ed), *Bitcoin and Mobile Payments: Constructing a European Union Framework,* (Palgrave Macmillan 2016) 290

foundational re-assessment of existing legal devices and the underlying normative values which shape the design of such devices. In this regard, the following chapter will undertake an analysis of existing legal devices which particularly regulate payments in modern banking.

CHAPTER V

MOBILISING PAYMENTS WITH LEGAL TOOLS

"Closer inspection of contractual relations, laws and regulations in finance suggests that law is not quite as evenly designed or applied throughout the system. Instead, it is elastic. In general, law tends to be relatively elastic at the system's apex, but inelastic on its periphery."[1]

5.1 INTRODUCTION

The preceding chapter discussed the innovativeness of cryptocurrencies, and critically examined its proposals, particularly how it works. Furthermore, by discussing the emerging ecosystem of cryptocurrencies, the chapter highlighted the challenges posed to law and social policy. Issues in relation to criminality, functionality and consumer protection were identified and discussed. The chapter concluded that cryptocurrencies raise a number of novelties, both for our existing payments system and broader social issues such as democracy. These novel issues fundamentally challenge existing theoretical explanations of regulatory goals and argued that, in order to ascertain whether or not a new regulatory approach is required, a re-assessment of existing legal devices must first be undertaken. Also, identified in our theoretical discussions in Chapter II, law and finance are quite inseparable. Law plays a vital role in constructing and sustaining the legitimacy of financial instruments, institutions and devices. The role of law is however a continuous one, serving to justify developing financial instruments to fulfil the overarching objective of minimising uncertainty, reducing volatility, asserting the integrity and credibility of service providers and ensuring safe entry of such developing instruments into the system. It is therefore argued in the previous chapter that, in relation to formulating a governance framework for cryptocurrency, it is inadvisable that law plays a leading role ahead of finance. Instead, law's role should be rather more subtle and constructive, providing underlying recognition only for aspects of cryptocurrency operations that are clearly useful. However, law must continually adjust in line with evolutions to cryptocurrency, particularly bases on on-going evaluations of technological developments. This approach

[1] Pistor, K., 'A Legal Theory of Finance' (2013) 41, *J. Comp. Econ*, pp. 315, 350

would foster continued technological developments and cryptocurrency would not be locked into a negative trajectory and promoting further innovation.

As *Pistor* relentlessly demonstrates, law provides an extensive toolbox to apex of the financial system's hierarchy and rather than objectively serve broad objectives, for instance in dismantling barriers to entry, reducing costs and protecting vulnerable end-users, law tends to be shaped and bent to serve the interests and objectives of a few. This resonates with our conversation in Chapter III in relation to the normative values which should underpin law and regulation. I conclude in that chapter that regulation is inherently designed to achieve the interests and objectives of select group interests, even contrary to so-called public interests. As such, regulation and law are often incapable of appropriately responding to innovation because of its reliance on 'old' evaluative indications, most of which are typically economic or political in nature.

Having established from the preceding chapter that cryptocurrencies are new and innovative, we acknowledge that it widely challenges and proposes disruptions to the traditional payments system. It will therefore be interesting to observe how existing financial rules, particularly those which govern payments and contained the 'legal toolbox' are adaptable to cryptocurrencies payments. More fundamentally, a careful examination of payments rules within UK's legal framework on payments will be necessary to provide evidence or dispel arguments about the role of law in constituting finance. If, as LTF suggests, law lends legitimacy to finance but only becomes a tool for the benefit of financial institutions and interests at the apex of the hierarchy, then an examination of these rules in relation to cryptocurrencies applicability will either confirm or debunk this theory. But a discussion on whether cryptocurrencies are significantly different or perhaps occupy a lower position within the financial hierarchy is also necessary in order to understand the context in which legal rules can be applicable, if possible.

This chapter, therefore, conducts an external critique of the current legal framework for payments, particularly relevant provisions for payment services. The chapter starts by setting out how the existing payments architecture works, thereby highlighting the specific

differences proposed by cryptocurrency. Thereafter, the chapter analyses the extent to which existing legal tools provide adequate solutions to the problems highlighted in the previous chapter, and identifies whether these rules pose additional problems which potentially lock cryptocurrencies technology into a negative trajectory. Ultimately, this evaluates the interaction of the rules governing payments under English law with the functional realities of cryptocurrencies exchange tokens.

In Chapter IV, considerable effort was put into expounding on both the technical and legal nature of cryptocurrencies. To assess whether existing legal devices are appropriate to address the specific nature of cryptocurrencies, it will be necessary to first identify how traditional payments work, particularly electronic bank-facilitated payments. It has already been demonstrated that, unlike with traditional payment systems where transactions are facilitated by 'trusted' financial intermediaries, cryptocurrencies transactions depend on a distributed ledger technology (DLT) otherwise known as the 'blockchain' to facilitate payments.

5.1.1 Response To Innovations In Existing Payments Framework

Attention has already gone into addressing an array of broad public law questions such as whether or not law needs to intervene in providing governance to cryptocurrencies payments in order to prevent systemic risks, consumer fraud or financial crime. There are, however, many more 'private-law' questions which remain unexplored. For instance, it is yet unclear whether cryptocurrencies can be legally qualified as 'money' for purposes of sales of goods or contract law; whether cryptocurrencies payments fit into existing payments framework in relation to rights and liabilities of payment parties in instances of failed payments; how theft or loss of cryptocurrencies should be addressed; and characterisation of third-parties, particularly wallet service providers or exchanges.[2]

Both private and public law questions provide useful insights into overarching questions of legal instrumentality, particularly its role in constructing finance. It is also of significant importance to explore the specifics of both spheres of law provides useful legal data

[2] Unlike traditional financial intermediaries, the role and nature of crypto third-parties are still much in flux and evolving.

required to investigate the response of law within the hierarchical structure of finance. This chapter demonstrates, on the one hand, that law disproportionately serves the interests of entities at the top of the financial hierarchy to the detriment of others, particularly those lower ends of this hierarchy. It also explores the adaptability of existing legal tools to cryptocurrencies payments, identifying specific aspects which are problematic to widespread adoption, on the other hand.

To conduct an analysis on the sufficiency of existing rules, it is important to consider in some detail the legal nature of cryptocurrencies, and thereafter, contrast this with the range of legal problems and solutions which have arisen from the traditional bank-driven payments system. This analysis will provide a basis upon which a comparative discourse about cryptocurrencies payments can be had. Given the proposed disintermediated nature of cryptocurrencies payments, such traditional legal rules may, as this chapter will demonstrate, be inadequate to cater to the peculiar challenges posed by cryptocurrencies payments.

As has already been discussed in chapter II, money, the traditional object of payments, has taken on different forms as a result of innovation.[3] When placed on a spectrum, these innovations in payments have ranged from physical monetary tokens, on one end, to more non-physical or electronic media, on the other.[4] As payment practices have largely moved from one end of this spectrum to the other, law has often been faced with the task of providing adequate legal solutions to the challenges thrown up by innovation.

It is therefore the case that most payment challenges thrown up by innovation cannot be described as entirely new. As a matter of fact, legal frameworks for payments have always relied on pre-existing legal principles such as agency or contract to deal with problems posed by innovation. For instance, in addressing the allocation of risk in intermediated payments, payments regimes often resort to the law of agency or contract to adjudge acts of intermediaries to be performed as acts of agents for on behalf of customers. As such,

[3] Bollen, R., *The Laws and Regulations of Payment Services: A Comparative Study* (Kluwer Law International, 2012), 54

[4] Davey, R., 'From Barter to Bitcoin? Online Payments and Electronic Money' in Lilian Edwards, *Law, Policy and The Internet* (Hart Publishing, 2019), 369

when it pertains to matters of legal rights or obligations of parties, agency law has so far proven a veritable source of legal direction.[5]

To a reasonable extent, as will be demonstrated later, the legal treatment of payment challenges has provided the payments industry with robust and somewhat consistent answers on a number of key issues. The key question answered in this chapter therefore is whether cryptocurrencies pose any new payments challenges unaddressed or unforeseen by the gamut of legal doctrines and principles, especially within English law. Regarding cryptocurrencies payments, the crucial questions which remain to be answered are, on the one hand, whether cryptocurrencies pose any new legal problems never before contemplated and, on the other hand, if they do, whether there are sufficient legal tools within the existing framework to thoroughly address any such problems.

As has already been pointed out earlier, cryptocurrencies payments fundamentally differ in some technical and functional respects from traditional payment systems and, I would argue, poses germane legal questions if adopted. Although I would tend to disagree with the proposition that cryptocurrencies payments do not pose any new problems and as such do not necessitate a critique of existing framework, it may be worthwhile to, theoretically, leave open a discussion about whether the law should remain unchanged.

Let us now our attention to two distinct but inter-related issues. First, a brief description of the structure of UK's payment services is necessary to identify characteristic features, operational challenges faced by stakeholders and the legal means of resolving such challenges. The aim in so doing is to lay a background for understanding the thrust of English law towards payments, particularly how such it addresses the unique challenges posed by electronic payments. Secondly, it is also important to perform an in-depth examination of the two principal legal frameworks – the European Commission's Payment Services Directive 2017[6] (PSD2) transposed into UK legislation in the Payment Services Regulations 2017, and the Electronic Money Directive 2009[7] (2EMD) transposed

[5] Bollen, R., *Op. Cit., 5*
[6] Payment Services Directive (EU) 2007/64/EC which is transposed into UK legislation in the Payment Services Regulations 2017. For the purposes of this chapter, references will be made to the PSR
[7] Electronic Money Directive 2009/110/EC

into UK legislation in the Electronic Money Regulations 2011. As it relates to cryptocurrencies, this second section identifies the unique challenges posed by cryptocurrencies payments which undermine the coherence and effectiveness of existing legal regime for payments; and the extent to which these payment frameworks address cryptocurrencies payment challenges, if at all.

SECTION I

5.2 THE UK PAYMENTS STRUCTURE

Payments are undoubtedly the lifeblood of any market economy because they generally involve the transfer of monetary value from a payer to payee. Except for relatively small-value transactions involving cash, a vast majority of payment transactions in the UK are made through complex payment methods which enable parties to discharge their payment obligations and allow money to circulate between individuals and businesses.[8] This payments circulation system is vast and important.[9]

The payments system is a network of payment encompasses several component parts such as payment instruments, processing, and other participants. The payment system is implicitly hierarchical, both globally and domestically.[10] For instance, globally, all other currencies are valued in dollars before they are compared to one another.[11] Domestically, the system is also hierarchical. As a matter of fact, the architecture of payment systems, shaped by institutions at the apex of this hierarchy, such as the BoE, inherently influences the payments industry.[12] The UK payments system is comprised of four categories of participants, namely: the payment regulators such as the BoE and the FCA both charged with minimising systemic risks to the entire network; the payment service providers

[8] Chiu, I., and Wilson, J., *Banking Law and Regulations,* (2019, OUP) pp. 73
[9] Ross Cranston *et al 'Principles of Banking Law'* (3rd Edition OUP 2017) pp. 335
[10] Pistor, K., *Op. Cit., 1*
[11] Mehrling, P., 'Essential Hybridity: A Money view of FX' (2013) (41)2, *J. Comp. Econ.,* pp 355, 363
[12] Gogoski, R., 'Payment Systems in Economy.- Present End Future Tendencies' (2012) 44, *Procedia – Social Behavioural Science,* pp. 463 - 445

(PSPs), the payments service operators (PSOs) often including the infrastructure providers; and the payment service user.[13]

Traditionally, PSPs provide a range of wholesale and retail payment services to the entire financial system. They are either orthodox financial institutions such as banks, credit institutions, building societies and money remitting agents mostly authorized by the Financial Conduct Authority (FCA). But also, PSPs can be non-orthodox entities such as electronic money issuers, non-bank merchant acquirers *et cetera*. Whether orthodox or non-orthodox, PSPs are highly regulated and payment services can, so far, only be offered by authorized service providers in accordance with the Electronic Money Regulations and the Payment Services Regulations.[14]

Payments Services Operators, on the other hand, provide other forms of ancillary services to the payment system. They are often responsible for providing the necessary payment infrastructure, i.e., the various hardware, software, secure telecommunications networks and operating environments which support *clearing* and *settlement*[15] of payments or funds transfer requests. They provide the core spine for the entire payments system with unique schemes and networks such as the New Payment System Operator (NPSO), Vocalink, Bacs payment system,[16] the Direct Debit system, the ATM Link switching platform covering 65,000 ATMs, Faster Payments Systems (FPS), and Real-Time Gross Settlements (RTGS).

Such payment infrastructure services form a vital part of the financial system because they enable funds to be effectively and timeously transferred between people, institutions and other systems.[17] PSOs are regulated by the Payment Services Regulator (PSR), created under the Financial Services (Banking Reform) Act 2013.[18] The scope of the Regulator's

[13] Cranston, R., *Op. Cit., 11*
[14] Regulation 2(1) Payment Services Regulations 2017
[15] These concepts will be discussed in a further section of this chapter.
[16] Bankers Automated Clearing Systems
[17] Financial Conduct Authority, 'Payment Systems Regulation: Call for Inputs', (2014). See: https://www.fca.org.uk/publication/other/psr-call-for-inputs.pdf Accessed 12 February 2018
[18] Part 5, particularly s. 40 'The Payment Systems Regulator' of Financial Services (Banking Rules) Act 2013 c.33

powers is extensive, including setting payment systems rules,[19] deciding on competition functions,[20] complaints,[21] technical standards[22] and relationships with other regulators,[23] amongst others.

Payment transactions often take a variety of forms, from high-value wholesale transfers between financial institutions to small-value retail payments as between individuals. The efficacy and reliability of the payment system is dependent, to some degree, on the integrity of the entire system. Integrity, in this sense, implies the ceaseless workings of all participants on the payment network. As such, both categories of payments are vital because they cater for both wholesale and retail financial payments, from day-to-day direct debits, wage payments *et cetera*. This therefore means that the inability of one payment institution to effectively and promptly complete a payment request can lead to a breakdown of the entire payments system. The reliability of the entire payment system is therefore dependent on the integrity of every payment institution to effectively make slated payments. As a matter of fact, there can be a risk of a systemic collapse of the entire payments system where the failure of a single participant can spill over to other participants, thereby potentially resulting in the gridlock of the entire system.[24] Making sure this intricate network of payment institutions never fail is therefore a major challenge which payment regulators are constantly preoccupied with. But also, the increasing request for faster payments, issues of cyber security, and the developments in financial technology (fintech) further exacerbate the challenges on payments.[25]

The point made here is that the payments system has evolved into a sophisticated network of agreements and contractual relationships between payment participants. For instance, PSOs will rely on the schemes developed by infrastructure providers, and PSPs will often

[19] s. 55, Financial Services (Banking Rules) Act 2013 c.33
[20] s. 54 – s. 67, 'Regulatory and competition functions' of Financial Services (Banking Rules) Act 2013 c.33
[21] s. 86 – s. 70, 'Complaints' of Financial Services (Banking Rules) Act 2013 c.33
[22] s. 97A – s. 97D 'Technical Standards' of Financial Services (Banking Rules) Act 2013 c.33
[23] s. 98 – s. 99, 'Relationship with other regulators' of Financial Services (Banking Rules) Act 2013 c.33
[24] Haldane Andy and Latter Edwin, 'The Role of Central Banks In Payment Systems Oversight' (2005) 45(1) *Bank of England Quarterly Bulletin*, , pp. 66–71.
[25] Douglas, A., *et. al,* 'The Evolution of Fintech: A New Post-Crisis Paradigm' (2016) Vol. 46, *Geo. J. Int'l. Law,* pp. 1271

use such infrastructure to deliver payment services to end-users. Resultantly, the network infrastructure provided by PSOs are important in providing quick, reliable, safe and convenient payments for goods and services. In England therefore, the fast pace of payments processing largely depends on longstanding co-operations between clearinghouses such as CHIPS, settlement services provided by the Bank of England, transmission systems such as SWIFT, and other participants such as Visa and MasterCard who provide end-user payment services.[26]

5.2.1 Payments Clearing and Settlements: Stages of Payment Processing

Before examining in greater detail peculiar payment challenges created within the existing payments system and how such challenges have been solved with the instrumentality of law, it is first necessary to understand the terminologies related with the clearing process and how it practically works.

Clearing can be described as a process through which payment instructions contained either in a cheque or other communication moves from a collecting bank where it is deposited or made to the paying bank; and the movement of the funds requested via the instruction in the opposite direction.[27] From start to finish, the process described above would often involve transmission, reconciliation, and confirmations of payment transactions.[28] Practically, at a set time each day, each branch of a collecting bank transports, mostly electronically by cheque imaging,[29] all cheques paid by customers to a central exchange centre. This central clearing exchange centre processes the cheques by capturing values, unique customer identifiers and codes on cheques. The data captured is converted into digitally encrypted files and transmitted to the Inter Bank Data Exchange (IBDE) for onward transmission to relevant paying banks. Both banks input their bilateral

[26] Cranston, R., *Op. Cit., 11*
[27] Chiu, I., and Wilson, J., *Op Cit., 8*
[28] Bank of England's Supervision of Financial Market Infrastructures, Annual Report 2016/17. See < https://www.bankofengland.co.uk/news/2016/march/supervision-of-financial-market-infrastructures-annual-report-2016> Accessed 21 February 2019
[29] In the UK as of 30 October 2017, by virtue of s.13 of the Small Business, Enterprise and Employment Act 2015, cheques are no longer statutorily required to be physically transported. Instead, presentation of instruments by electronic means are now acceptable. This has enabled the use of cheque imaging to improve the speed and efficiency of cheque clearing processes.

pay and charge figures onto a browser-based application which must then be paid to or received from each bank.[30] The next step in this process is *settlement.*

Settlement, on the other hand, is the final transfer of monetary value to discharge a payment obligation. Most payment obligations will require the active participation of a payment intermediary, such as a PSO or PSP, as discussed above. When the discharge of a payment obligation between two parties is effected by the crediting and debiting transaction accounts held with a bank or other payment institution, then such bank or payment institution becomes an intermediary in the payments process.[31] The Settlement Service Provider (SSP) in England and Wales is the Bank of England and it utilizes the Society for Worldwide Interbank Financial Tele-Communications (SWIFT) messaging to transmit payment figures directly into the Real Time Gross Settlement System (RTGS) domiciled at the Bank of England for final settlement.

Where the payment obligation is between two banks, for instance, then such payment is usually completed by amending the 'settlement accounts' held at the Bank of England. Settlement timing can occur immediately in 'real-time', as is the case with RTGS schemes which require participants to have sufficient liquidity to carry out payment orders immediately.[32] But also, settlements can occur at a later time. In other words, in most payments, the final transfer of monetary value to discharge a payment obligation often occurs between a payee and payer bank long after payment instructions have been given.

This can cause some significant legal problems, especially in relation to liability for wrongful payments by collecting or paying bank, ambiguous instructions, negligence in collection or payment of funds, when payment can be deemed legally discharged, countermand of instructions, availability of funds, completion of payments *et cetera.*

We will get back to these issues a little later but first, a cursory look at the stages of non-cash payments must first be undertaken. Payment transactions on the payment system

[30] Chiu, I., and Wilson, J., *Op Cit., 8*
[31] Cranston, R., *Op. Cit., 11,* pp. 347
[32] Dent, A., and Dison, W., 'The Bank of England's Real-Time Gross Settlement Infrastructure' (2012) *Q3 Bank of England Quarterly Bulletin.*

mostly occur in four broad stages – payment instructions, payment generation, payments clearing, and payments settlement. In the first instance, a payer communicates payment instructions contained in a point of sale (POS) medium such as a cheque, wire transfer or electronic device. The communication, directed to a third-party account custodian such as a bank, mandates the account custodian to transfer monetary value to a payee's receiving account custodian. Thereafter, the payment instruction goes through the clearings process described above. A final step, the payments settlement stage, occurs when the payee's custodial bank account is credited, and the payers' is debited. Although, for instance, a payee may draw out or have funds reflected in their bank account, the final settlement process is incomplete until funds have been moved from the central clearing settlement service provider. In effect, although a payment instruction may have been sent and received, the delivery of funds which occurs upon payment settlement may occur a while after instructions have been communicated, or in some cases, long after a payee has received the funds.[33]

As hinted earlier, these throw up a range of problems. First, if payments are said to occur before the actual delivery of funds, when then is a payment obligation discharged? Secondly, can a payee cancel or countermand a payment instruction at any time before delivery of funds? Thirdly, when can payment be said to be final? It is important to understand how existing legal framework address these issues, in order to evaluate whether they may apply to the same nature of problems in relation to cryptocurrencies payments.

5.2.2 Discharge, Countermand, Availability, and Finality

5.2.2.1 Discharging Payment Obligations

As hinted above, the delineation of payments into procedural stages raise a number of legal implications, especially given the time interval between when a payment instruction is sent and when payment settlement finally occurs. This particularly poses the legal question - when is payment obligation discharged? The discharge of a payment obligation

[33] Cranston, R., *Op. Cit., 11*347

can become incredibly important, especially in relation to contractual transactions where express or implied contractual provisions stipulate consequences of late payment beyond a predetermined date and/or the resultant legal right to terminate a contractual relationship. For instance, where the date for payment has been contractually expressed or implied as being 'of the essence', to default in such payment obligation may be deemed as a breach of contractual term which would grant a payee the common law right to terminate such contract.[34]

1) The Exactness of Time: Deciding on liability

Given the multilayer nature of payments, from instruction to settlement, it has proven problematic in law to ascertain the exact point in time by which payment obligations are to be deemed discharged. Ascertaining the exact point in time is essential in apportioning responsibility in events of delay, on the one hand, and to provide certainty to contracting. There are a few legal rules developed to address this problem. Let us consider how this challenge has been resolved under both the common law and by statutory provision.

a. Common-Law

Under common law, the general rule as to the exact point in time when a payment obligation is said to be defaulted upon was extensively discussed in *Afovos Shipping Co SA v R Pagnan & Fratelli.*[35] In answering the question "what is the latest point of time which would have constituted punctual payment of the instalment?" Lord Hailsham of St. Marylebone L.C. observed in that:

> I take it to be a general principle of law not requiring authority that where a person under an obligation to do a particular act has to do it on or before a particular date, he has the whole of that day to perform his duty. No

[34] Under the common law, contractual terms are considered as the lifeblood of the contractual relations between two parties. Depending on the exact nature of the contractual terms, a party may be entitled to immediately repudiate a contract where a 'condition' or 'warranty' has been breached. In most contractual relationships, payment terms are generally regarded as conditions which run to the root of the contract. Failure to make payment on the predetermined date would therefore provide grounds for a suit for breach of contract. See. for instance, the cases of *Grand China Logistics Holdings (Group) Ltd v. Spar Shipping AS* [2016] EWCA Civ 982; *Dalkia Utilities Services Plc v Celtech International Ltd* [2006] EWCH Civ 63

[35] [1983] 1 W.L.R. 195

> doubt as the hours pass it becomes less and less probably that he will be able to do it. That is the risk he runs. But he is not actually in default until the time arrives. The question is not when a when a charterer would case to be likely to pay in time but when, to quote clause 5, "punctual payment" would have failed. In my opinion this moment must relate to a particular hour and is not dependent on the modalities of the recipient bank. It is the hour of midnight to which the general rule applies.

This common law position is quite straightforward, especially in relation to instances of direct person-to-person transactions. However, for a number of reasons, it is right to allude to the incompatibility of this common law position on modern and contemporary payment practices. It will resultantly be problematic to apply the 'midnight rule' to the complex nature of payment transactions which are often built into contractual relationships and involve third-party intermediaries such as banks. Furthermore, globalization and harmonization of the marketplace mean that most banks will not operate on the same time basis, therefore making it difficult to apply this rule to payments originating from regions outside the UK's time zone.

The 'close of business' approach adopted by most banks in place of a 24-hour time approach is a case in point. To rely on a 'close of business' time arrangement as the alternative to the common law 'midnight rule' might seem a good solution, but in reality, it is not for the law. It would admittedly be too uncertain a legal test, especially given the non-existence of uniformity in relation to the 'close of business time' across the banking sector.[36] The only conclusion to be drawn is therefore that existing payment methods are also legally and efficiency-flawed because they could spell catastrophic consequences for the timely non-discharge of payment obligations.

Rightfully, English courts have approached this issue on a flexible case-by-case basis, taking the specific circumstances of each case into consideration. The court's approach, therefore, varies when, for instance, in commercial contracts with express or implied terms that payment be made to into a pre-determined account in a nominated bank and on the pay date; or when payment is agreed to be conditional on the occurrence of an event; or

[36] Cranston, R., *Op. Cit., 11,* pp.342

when no specified payment method is agreed by the parties. Let us now consider each of these categories in more detail.

This was exactly the case in the *Afovos Shipping* Case,[37] for instance, where the respondents gave instructions in good time to their bankers, the Padua branch of the Credito Italiano, to make payment to the London branch of the First National Bank of Chicago for the credit of another party. Unfortunately, a clerical error by the Padua branch of the Credito Italiano meant that although a payment telex seemed to have been forwarded by the payer's bank on time, there were errors in the payment message which was only discovered and corrected after the payment became overdue. The appellant thereafter gave notice of termination, claiming to be entitled to exercise such right as at any time after midnight on the pay date. The courts rejected the general midnight rule as inapplicable, especially given that the affected party was innocently unaware his bank had not transmitted the payment.

Correct as a 'case-by-case' approach may be, it however does not provide sufficient legal or commercial certainty to the payments sector. It means that the courts may adopt a different approach depending on the nature of the payment obligation or relationship between parties. Although there is legal precedent in relation to commercial contracting, it is yet to be settled for all other forms of payment obligations or circumstances. In any case, the nature of electronic commerce or the advancement of technology into payments make it incredibly difficult to distinguish or define payment transactions as 'commercial' or otherwise. There might therefore be reason for more specific rule, perhaps statutory in nature.

There are other problems where a midnight rule provides no solution, even in commercial contracts. For instance, where parties have agreed that a payment obligation is discharged when such payment is placed in an account in a nominated bank and on a specified day, a payment obligation is deemed contractually discharged once such payment is received by the nominated bank. In other words, a payment to the nominated bank, which in most

[37] See *Afovos Shipping Co SA v R Pagnan & Fratelli* [1983] 1 W.L.R. 195

cases would be the payee's bank, will be deemed as payment to the payee.[38] But in this regard, at what point in this transaction can it be definitively said that payment obligation is discharged? The midnight rule allows for a few potential answers. Is it when payment instructions are transmitted by the payer to his bank? Or, when payer's bank sends payment to payee's bank. Alternatively, perhaps, is it when final payment settlement occurs between both banks?

English courts resolve this question by relying on the international framework of the *Model Rules on the Time of Payment of Monetary Obligations* to the effect that "payment is deemed to be made at the moment when the amount due is effectively put at the disposal of the creditor."[39] Since the claim will be between the payee and the payee's bank, payment obligation is legally deemed to be discharged when the payment bank makes an '*unconditional*'[40] decision to credit the payee's account, and not merely when payment message is received by the payee's bank from the payer's bank.

As a test, the courts have often opted for an objective test to ascertain the exact point in time in which an unconditional decision would be deemed made by a payee bank. But this may further complicate issues and further dissipate certainty. For instance, recourse is often made to evidence of practices within the bank such as whether decisions of such nature are usually made later after debits and credits have been finalized.[41] Of course, it does appear robust rules already exist to regulate how to ascertain the discharge of payment obligation, especially when it involves third-party intermediaries. And a majority of these rules have, as demonstrated above, emanated from banking practices and conventions around the importance of the notification,[42] when an amount less than is owed

[38] See *PT Berlian Laju Tanker TBK v. Nuse Shipping Ltd* [2008] 1 C.L.C. 967; See *Afovos Shipping Co SA v R Pagnan & Fratelli* [1983] 1 W.L.R. 195

[39] The International Law Association, 'Warsaw Conference Resolutions' (1988) 63, *Int'l L Ass'n Rep Conf,* pp. *14*

[40] The conditionality of such a decision to credit a payee is difficult to objectively ascertain. However, the courts have previously rejected instances where accounts are provisionally credited, when a payee is subject to pre-conditions, or depending on administrative processes. The precise point of this unconditional decision will therefore depend on the evidence pleaded by parties

[41] *Holmes v. Governor of Brixton Prison* [2004] EWHC 2020

[42] Although a payee is legally treated as having been paid, despite not receiving any notice to that regard, a bank is required to notify the payee in instances when payment is made in a different currency than contractually agreed, or when amount paid is less.

is paid,[43] or when payment has been made in a 'wrong' currency.[44] It will, however, be problematic to apply these rules, which draw legitimacy from practice to the incursion of technology into payment practices.

2) Absence of Agreements on Payment Methods and Currency

Let us also consider how common law reacts to instances where no express or implied contractual terms exist on a preferred payment method. The default position when no payment method has been agreed is to revert to 'legal tender' rules under English law which stipulate, generally, that a payee must accept the legal tender, i.e., sterling notes and coins, in the discharge of a payment obligation.[45] Interestingly, however, this rule seems firmly rooted in the *archaic* concept of 'money' under English law.

In most cases, the courts have, as a matter of first recourse, held that payment obligations under these circumstances be discharged in cash unless this 'right to cash'[46] has been waived by a payee.[47] The 1989 case of *Libyan Arab Foreign Bank Ltd* [48] is a case in point. The plaintiff, a Libyan bank, operated a transaction account with the London branch of the defendant, an American bank. Both parties had been involved in high-value monetary transfers from London to New York on a daily basis for a number of years. However, in January 1986 the US President signed an Executive Order freezing all Libyan property in the United States or in the possession/control of US persons, including overseas branches of such persons. It, therefore, became illegal for the defendant to transfer any funds to the plaintiffs using facilities available in the United States. Upon the request of the plaintiff, the defendants refused to make payments contending that it would be impossible to so do without committing an illegal act in the United States. *Staughton J,* finding for the plaintiffs, made the following remarks:

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[43] *Tenax Steamship Co. Ltd v Reinante Transconeania Naveagacion SA* (The Brimnes) [1973] 1 WLR 386
[44] See *Mardorf Peach & Co. Ltd v Attica Sea Corporation (The Laconia)* [1977] AC 850
[45] Cranston, R., *Op. Cit., 11,* pp.344
[46] Cash as in the domestic currency of a country as opposed to receiving cash from a different jurisdiction.
[47] Proctor, C., *Mann on The Legal Aspect of Money* (7th edn, Oxford Clarendon, 2012) 75, 179
[48] *Libyan Arab Foreign Bank v. Bankers Trust Co*. [1989] QB 728 pp. 745E-746A

> The demand for cash was an assertion of a customer's fundamental right and delivery by the defendants of cash in London of the sums claimed would not have involved illegal action in New York, and that, therefore since the plaintiffs had made a demand for cash, they were entitled to receive payment in dollars or, if payment in dollars was impossible, in sterling and, accordingly, the defendants were liable to the plaintiffs for breach of their obligation to provide cash on the plaintiff's demand.[49]

Though described as a 'fundamental right', a payee may waive this default position and instead stipulate another method or indeed another currency, either by specifically stating so or by indicating acceptance after payment by another method. Following therefrom, it is worth asking whether there would be a legally protected right for parties to prefer payment with cryptocurrencies, or whether this concept of rights will not extend to payment mediums not covered under the Legal Tender Act.[50]

Of course, one way to proceed with this argument is to approach cryptocurrencies as a unique intangible 'good' transferable between parties by virtue of its unique features. On this point, however, one obstacle immediately becomes apparent. The Sales of Goods Ac[51] explicitly excludes 'goods' from its contemplation of what amounts to 'money'. It defines 'goods' as including "all personal chattels other than things in action and money."[52] The implication is, therefore, that money cannot be classed as a 'good', although it makes no indication of what it contemplates as 'money'. Put simply, according to the 1979 statute, payment parties would have no legal right to use 'goods' as a form of 'payment'. The primary sense in which the word payment is used as the transmission of money can give rise to a number of difficult issues. It is therefore important to fully understand what 'payment' as the transmission of money means.

Except where payment is made by physical delivery of money tokens i.e. cash or coins, it is argued that payment of money does not involve the transfer of any physical thing, nor even of rights and claims. Instead, payments are a series of transactions in which rights and claims are extinguished and replaced by new rights and claims in favour of other

[49] *Ibid.*
[50] Legal Tender Act of 1862
[51] Section 61, Sales of Goods Act 1979
[52] *Ibid.*

parties.[53] In other words, what qualifies a transaction as 'payment' is not the fact that it is achieved by exchanging any physical thing or rights. Rather, what qualifies any transaction as payment depends on whether a right or claim has been extinguished and replaced by other rights or claims. This is an interesting argument which shifts the emphasis from a medium of payment to the function of such a transaction.

In the controversial case of *R. v Peddy*[54], the court was faced with a question whether a fraudulent transfer of money through the UK banking system fell within the wording of s. 15(1) of the Theft Act 1968. The House of Lords, reversing the Court of Appeal, held that where D dishonestly and by deception procures a transaction whereby V's bank account is debited in favour of D's account, D will not be guilty of obtaining property belonging to V, contrary to s.15 of the Theft Act 1968. The reasoning behind this decision was that, in law, a property which belongs to one person (V) will not automatically belong to another (D) because the "thing in action" has been diminished and a different "thing in action" belonging to D has been created. Lord Jauncey explained this in the following terms:[55]

> There falls to be drawn a crucial distinction between the creation and extinction of rights on the one hand and the transfer of rights on the other. I start with the proposition that the money in a bank account standing at credit does not belong to the account holder. He has merely a chose in action which is the right to demand payment of the relevant sum from the bank. I use the word money for convenience, but it is, of course, simply a sum entered into the books of the bank. When a sum of money leaves A's account his chose in action quoad that sum is extinguished. When an equivalent sum is transferred to B's account there is created in B a fresh chose in action is the right to demand payment of that sum from his bank.

This process described by Lord Jauncey does not refer to a physical transfer of anything, but instead the extinction and creation of rights to make claims, what he calls *chose in action.* This, therefore, presupposes that even though a payer walks into the payee's bank and deposits actual cash or cheque, such cash or cheque would, at a first instance, be in

[53] Bamford, C., *Principles of International Financial Law,* (2015, OUP) pp. 58
[54] [1996] AC 815
[55] *R. Peddy* [1996] AC 815, 841

possession of the bank and resultantly become its property or asset. At best, it will only create a situation where the bank becomes a debtor to the payee.

This creates a unique problem for cryptocurrencies. First, would legality of cryptocurrencies payments depend on whether they are accepted by traditional financial institutions like banks order to create or extinguish rights? Secondly, could cryptocurrencies fit into the conceptual framework of 'payment instrument' under English law? On the second question, the implication from the Sale of Goods Act indicates that 'money' must be distinguished from other instruments of payment such as 'bills of exchange' which is defined "as an order to pay a sum of money".[56] This attitude of distinguishing money from other payment instruments creates conceptual difficulties, especially if cryptocurrencies payments are to become more widespread. To solve this theoretical problem would require an appropriate reframing of the conceptual framework of money and payments under English law.[57]

3) Conditional Completion of Payments and Contractual Agreements

What the above demonstrates is that, under English Law, a payment obligation is largely dependent on long-standing legal tenets, themselves found in common law rules around the law of obligations, particularly contract law. English courts seem prepared to, in the first instance, generally uphold the objective intentions of contracting parties. Where such intentions are not easily ascertainable from express contractual terms or by implication of previous dealings, the courts apply a set of common law rules. If that is the case, it, therefore, begs the question of whether a payment obligation contractually agreed to be in cryptocurrencies will be upheld by English courts? Or if a payment obligation will be deemed as discharged if a payee accepts cryptocurrencies in the absence of any express or implied payment agreements? It remains unclear how English contract law will respond to contractual agreements which stipulate payment of cryptocurrencies in the discharge of payment obligations. In other words, will contractual consent to pay in crypto be legally invalidated by English courts?

[56] Section 3, Bills of Exchange Act 1882
[57] Edwards, L., *Law, Policy and The Internet,* (Oxford, Hart Publishing 2019) 372

Let us consider how other issues of contractual terms and conditions have been treated by the courts. As far as payments through bank-related methods such as credit transfers or cheques are concerned, English law takes the position that it will be unnecessary for a payee to communicate acceptance to a payer regarding payment currency, as the mere absence of an express reference to the contrary will be deemed as consent.[58] But there are instances where contractual consent may not be as straightforward. For instance, some contractual terms may require that a payment obligation be deemed discharged contingent only upon the fulfilment of a condition such as on the occurrence of certain events.

Generally, in such cases, English contract law takes the approach that payments will not be deemed as finally discharged until those conditions are met. Furthermore, where such conditions are not met, the general rule is that repayments must be made. In *Guardian Ocean Cargoes*,[59] a shipbuilding yard had agreed to construct a ship for a ship-owner, with financing provided by the defendant. The ship-owner ran into financial difficulties, and the plaintiff was eager to take over the contract. As a result, it deposited some money as a token of future intent and the sum was payable only on the successful conclusion of refinancing negotiations. When negotiations broke down, and the suit was filed for the recovery of the sums paid, the court held that payment was conditional and not outright. The court in such cases usually find that money payable and depending on set conditions are to be held in some form of 'trust'. This is illustrative of the general attitude of English contract law to the effect that contracting parties may agree to terms which stipulate further payment modalities such as terms withholding the transfer of title on a purchased item until specified conditions are met.

In a banking context, however, English law generally treats certain forms of payment as conditions such as payment by cheques or bills of exchange. The implication is, therefore, that payment is subject to the condition that the instrument is only payable when presented to the bank. As such, a payment obligation will be deemed discharged if the instrument is presented to and honoured by the bank.[60] This means that if the instrument is dishonoured

[58] Cranston, R., *Op. Cit., 11,* pp.344
[59] *Guardian Ocean Cargoes Ltd. V. Banco do Brasil* [1994] CLC 243
[60] Cranston, R., *Op. Cit., 11,* pp.343

or not presented by the payee, the payment obligation becomes revived.[61] For example, a payee who receives a cheque from a payer/purchaser but, for one reason or another, fails to present the cheque at the bank cannot claim that a payer's payment obligation has been discharged.

These sorts of conditional payment instruments pose several significant questions of risk and liability. First, if a payment method involving a third party involves some measure of risk, and a payee accepts such payment method, who bears the risk of non-payment? Secondly, are there any legal principles in English law which deal with the consequences of a payee accepting a risky payment method? These questions are particularly important when considering the risky nature of cryptocurrencies payments, especially in relation to loss or price volatility. English courts are yet to determine this question in relation to cryptocurrencies. But, as it relates to a risk of non-payment of fiat-based payment instruments, the English Court of Appeal was called upon to determine this in *Charge Card Services* case.[62] *Millet J.* held that there exists a general principle of law that:

> Whenever there is a method of payment adopted which involves a risk of non-payment by a third party there is a presumption that this operates as conditional payment only or that the risk of default is on the person who is under the obligation to effect payment.

As far as the risk to bear default is concerned, it is not entirely clear what is meant by 'the party under obligation to effect payment'. Sure, in a banking context, it may be safe or even intuitive to assume that a third-party bank has the primary duty to 'effect' payment. But it is not as clear-cut when payment involves a non-bank third-party. For example, in an e-money context, are payments effected when a purchaser proceeds to checkout or when the payment is processed by the e-commerce website? Furthermore, will it be the responsibility of the buyer's card provider, if not a bank?

The application of this general principle would be even more problematic in cryptocurrencies payments where a payment verification is mostly conducted by the

[61] Vroegop, O., 'The Time of Payment in Paper-based and Electronic Funds Transfer System' (1990) *L.M.C.L.Q.,* pp. 64; re *Charge Card Services Ltd* (No.2) Ch. 497
[62] Re *Charge Card Services Ltd* (1998), No.2 Ch. 497

cryptocurrencies holder/owner unknown members on the decentralized blockchain network. In such cases, it would be incredibly difficult to ascertain the exact computer or network participant responsible for effecting payment. It is therefore suggested that each method of payment is considered in the light of the consequences and circumstances peculiar to that method of payment.[63] As far as cryptocurrencies payments are concerned, it would be even more important to evolve a bespoke rule which takes into consideration the peculiarities of effecting or verifying transactions.

4) Countermanding and Revoking Payments

As discussed earlier, payments necessarily begin with the communication of instructions from a payer. Generally, a payer is legally able to revoke or cancel his instruction before it is acted upon. This general rule is rooted in the law of agency which, as indicated earlier, considers the payment institution as an agent of the payer. This revocation is what is referred to as 'countermand'. The ability to countermand a payment instruction is important especially when payment instructions have been misdirected. Having noted the four different stages of payments, it is important to interrogate the implications of a revoked or countermanded instruction. In other words, what happens when a payer withdraws a payment instruction? What are the legal consequences of revocation on payment parties? If any such rules exist, it will be interesting to observe how such rules could apply to cryptocurrencies payments. We will defer discussions on the latter question to a further section.

Regarding countermanded instructions, the general rule, in relation to bank payments, is that instructions to withdraw or stop payment creates a corresponding obligation on a payer's bank to comply, so far as it is practicable. Considering that payments create and extinguish legal rights, as discussed earlier, it is important to examine the circumstances under which such a right to revoke payment instructions will have legally arisen. Given the instant nature of most electronic payments, more so cryptocurrencies payments, it is important to consider the legal guardrails which guide revocations under English law.

[63] Cranston, R., *Op. Cit., 11,* pp.345

Once again, English courts generally resort to contractual obligations in determining the above questions, especially where such revocation is contractually agreed. In other words, whether and when a party can revoke will generally be determined by the contractual agreement between a payer and his third-party payment provider (or bank). Additionally, the existing rule is that a countermand instruction must be clear, on the one hand, and must be brought to the attention of the bank as soon as practicable.[64] In fact, such express notice of revocation, as was held in *Westminster Bank Ltd*[65], must be given to the branch or contact point in the bank where the account is located. This rule clearly indicates, just as with previously discussed rules, that the attitude of law seems to be following practice. Until now, it has been the practice that financial institutions like banks would operate physical branches in locations with dedicated personnel who assist customers with their payment transactions. But whether a rule which sets a test of 'where account is located' could apply in instances of virtual or online banking is unthinkable. Without physical branches or human personnel, requiring a payer to notify intention to withdraw or revoke a payment instruction would become unworkable.

Generally, revocation or countermand rights, as discussed above, are usually limited. These limitations are mostly defined either contractually or merely as a result of usage or practice. For instance, the rules of CHIPS, the US based payment system based in New York, provides that payment messages can be changed, added or removed only "if instruction is received within a reasonable time before payment message has been released."[66] Other payment systems often have definitive rules to ascertain when payment instructions may be revoked or countermanded. Under English law, however, especially in instances where no contractual intention exists, the following rules have become recognized.[67] First, a payer who instructs a bank to hold funds to the disposal of a payee can countermand up until the point at which the credit has been given to the payee. Secondly, a payee who instructs a bank cannot revoke beyond the moment the bank incurs

[64] *Curtice v. London city and Midland Bank Ltd.* [1908] 1 KB 293
[65] *Westminster Bank Ltd. v Hilton* (1926) 43 TLR 124
[66] Article 2: Delivering, Storing, Releasing, and Receiving Payment Messages, CHIPS Rules and Administrative Procedure, February 2016. See https://www.theclearinghouse.org/-/media/files/payco%20files/chips%20rules%20and%20administrative%20procedures%202016.pdf?la=en Accessed 21 February 2019
[67] Cranston, R., *et al 'Principles of Banking Law'* (3rd edn, OUP 2017) pp.346

a commitment to a payee. And thirdly, a payer who instructs its bank to pay a payee with an account at another bank cannot revoke once the payee bank has acted on the instruction from the payer's bank.

The conclusion is, therefore, that as far as fiat-based payments are concerned, there are robust rules on when payments may be countermanded. But the legal right to revoke ultimately impacts on payment finality. For this reason, it appears that such a legal right cannot last in perpetuity. For instance, most credit and debit card terms and conditions specify that cardholders may not countermand any payment after it has been initiated with the card.[68] Also, it is indicated that most terms and conditions of common electronic payment services provide that payments are irrevocable once the order has been validly authorised and given to the payee. However, as regards cryptocurrencies payments, it is yet unclear whether it is possible for a wallet-holder to countermand a transaction once initiated; whether a wallet holder's instructions may be terminated through external factors; and how responsibility can be allocated for such revocation between wallet-providers, wallet-holders and the network nodes.

5) Availability of Funds and Payment Finality

From the discussion above, it is now apparent that the discharge of payment obligations depends largely on an unconditional decision of the payer's bank to action a payment instruction. However, it is noteworthy that such decision to activate a payment instruction will depend largely on whether a payer's bank is satisfied with the availability of funds in order to complete the payment action, or whether the payee bank is prepared to credit the payee's account unconditionally. This means there are instances where, despite receiving payment, a payee may become indebted to the bank and therefore will be unable to withdraw funds until its indebtedness is settled. Also, there are instances a payee will not have access to money because a payee bank has delayed crediting the payee account. Reasons such as when the payee's account needs to check for fraud, money laundering, terrorist financing or the existence of a freezing order etc.[69]

[68] Bollen, R., *The Law and Regulation of Payment Services,* (2012, Kluwer Law International) pp. 126
[69] Cranston, R., *et al 'Principles of Banking Law'* (3rd Edition OUP 2017) pp.347

At first glance, the payment process may appear simple and straightforward. It is, however, anything but, as demonstrated above, payments require the cooperation of many different actors and services to make payments, from instruction to clearing, efficient and without incident. As a result, the operation of the payment system is often cumbersome and leads many[70] to believe the incorporation of financial technologies can provide more efficient payments which eliminate delays to merchant and inconveniences to consumers. Payments have evolved significantly. The availability of electronic payments, electronic commerce, and electronic banking have meant a significant change in the payments landscape.

Having set out in broad terms the nature of payments, and particularly how the law addresses some of the issues with payments through third-party intermediaries such as banks, we will now turn attention specifically to how recent payment regulatory frameworks, particularly those aimed at electronic payments, have addressed some of the third-party concerns addressed above. The aim of such analysis will be, more specifically, to consider how these new frameworks can be adapted to cryptocurrencies payments.

As noted earlier, there is yet any direct or precise treatment of cryptocurrencies as a form of payment under English law. This lack of legal treatment is arguably informed by the fact that, although cryptocurrencies can potentially be used as a means to facilitate payments, there is no statutory provision under which such payments could be treated as legally permissible.[71] The reality is, however, that notwithstanding the absence of statutory guidelines, cryptocurrencies payments continue to evolve, driven by its capability to make immutable and irrevocable payment transactions possible. Some form of regulatory innovation will be required to produce legal rules which can adequately cater to payment transactions based on cryptocurrencies.

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[70] Phoebus Athanasiou, 'Impact of digital innovation on the processing of electronic payments and contracting: an overview of legal risks' (2017), European Central Bank Legal Working Paper Series. See https://www.ecb.europa.eu/pub/pdf/scplps/ecb.lwp16.en.pdf?344b9327fec917bd7a8fd70864a94f6e Accessed 23 February 2019

[71] 'The future of money' – Speech by Mark Carney, Bank of England, 2018, https://www.bankofengland.co.uk/speech/2018/mark-carney-speech-to-the-inaugural-economics-conference. Accessed 12 Feb 2019

The next section will assess provisions of the PSR and EMR which broadly claim to protect consumers, protect the integrity of the UK's payments sector, promote effective competition, and reduce systemic risks which pose threats to the stability of UK's payments system. It will be useful to assess the applicability the PSR and EMR to cryptocurrencies payments.

SECTION II

5.3 FROM ORDER TO OPEN BANKING

In this section, we consider how the primary regulatory frameworks to mobilize payments in the UK have be used to address the specific issues discussed above, particularly as it may be applicable to regulate cryptocurrencies payments. Our first focus on the payment services framework, immediately followed by an analysis of the electronic money framework.

The European Union's revised Payment Services Directive 2015 (PSD2)[72] which replaced an earlier 2007 Directive[73] is directly transposed into UK legislation in the Payment Services Regulations 2017. The creation of the European single economic market which has, over the years, led to an increase in economic activity across the European Economic Area (EEA) necessitated the development of payment services and processing infrastructure to facilitate smooth payments across Europe. In this regard, the EU introduced regulatory frameworks to manage associated risks and promote harmonized payment processing systems across Europe.[74] The main goal of the directive is to ensure that international payments, particularly within the EEA, are technically easier to complete, efficient and secure.

The importance and impact of PSD2 to the payments industry must be situated, first, following a brief discussion of its predecessor – PSD1, in order to identify some of its

[72] Directive (EU) 2007/64/EC
[73] Payment Services Directive 2015/2366
[74] Adeyemi, A., 'A new phase of payments in Europe: the impact of PSD2 on the payments industry', (2019) Vol. 47, *Computer and Telecommunications Law Review.*

aims and challenges. The first Payment Services Directive[75] generally established rules for the payment services sector in the EU Member States. It sought to harmonize relevant regulation in the EU and to enable competition with the banks in the provision of payment services. It also aspired to improve consumer protection and regulate the participation of third parties in payment processing. However, many of its provisions were considered ill-equipped to deal with the myriad payment issues, particularly those occasioned by the incursion of technology and innovation into the payment services sector.[76] More specifically, PSD1 is said to have completely neglected to develop any sort of considerations with respect to technological innovations and new market entrants, curb instances of security or privacy breaches arising from the use of alternative, private and peer-to-peer digital payments such as bitcoin.

PSD1attracted a lot of criticism, particularly in relation to its narrow scope of applicability, as indicated in its interpretation of 'payment service'. Most notably, its restrictive applicability set significant barriers to entry to new payment service providers, hence raising competition policy concerns.[77] For instance, PSD1 specified the list of institutions which could perform payment services, with a longer list of excluded activities and potential third parties in its 'negative scope'. Article 3(k) provided as follows:

> This Directive shall apply to none of the following: services based on instruments that can be used to acquire goods or services only in the premises used by the issuer or under a commercial agreement with the issuer either within a limited network of service providers or for a limited range of goods or services.

In effect, only licenced payment institutions such as banks; credit institutions; e-money institutions; Post Office Ltd; the Central Bank (or BoE in the UK) when not carrying out its function as a monetary authority; and governments and local authorities when not carrying out functions of a public nature could perform payment services.

[75] Implemented in the UK through the Payment Services Regulation 2009
[76] Adeyemi, A., 'A New Phase of Payments In Europe: The Impact Of PSD2 on The Payments Industry', (2019) Vol. 47, *Computer and Telecommunications Law Review.,* pp. 34,86
[77] Cranston, R., *et al 'Principles of Banking Law'* (3rd edn, OUP 2017) 361

Although the limited network exception followed pre-existing legal and commercial practice, it became very problematic as it exempted payments that were limited by geography, limited by the number of participating merchants, and limited by the range of goods and services for which payments can be made. As a result, for instance, this meant that retail chains that ordinarily process significant payment volumes were effectively unregulated.[78] But more importantly, innovative and technologically driven payment solutions which were being developed in the aftermath of the financial crisis received no regulatory reach. This implied greater risks, an absence of legal protection for consumers of such services, and an unlevelled playing field for regulated payment companies.

But a more important challenge posed by this provision was the confusing interpretation of 'limited network', or lack of. Other than the exact text of the directive in 3(k), there were little further clarifications of what is meant by 'limited network'. This was a question of degree, as it bordered on how much services could be enough to exceed 'limited'. In the Q & A under PSD1, the question "what services are meant?" received an answer which indicated that the intention of PSD1 was to exclude "store cards" which can "only" be used for payments in specific chain shops and "club cards" often "only" usable to purchase items in a "holiday compound."[79] Although no reason is adduced for this treatment of club and store cards, perhaps the EU did not envision that such cards can create large payment volumes. If so, focusing payment rules only on payment instruments which attract significant volumes of patronage seems to serve and protect incumbent payment companies with established instruments, while, unfortunately, hindering companies with new solutions yet to receive significant patronage. The implication is, therefore that PSD1, given Article 3(k), undermined its aim of encouraging competition in payment services.

Of course, determining what services fell within the scope of 'limited network' under article 3(k) devolved to the Member States to either set qualitative thresholds or determine what amounted to 'limited network' on a case by case basis. This, therefore, left a wide

[78] Malinauskaite J., 'Payment Systems Regulator – A New Body to Improve Competition in the UK Payments Sector', (2015) 37 *Eur. Competition. L. R.,* pp. 525

[79] Your Questions on PSD. See: https://ec.europa.eu/info/system/files/faq-transposition-psd-22022011_en.pdf Accessed 21 February 2019

margin of discretion to domestic regulators or lawmakers. Another significant problematic exemption created under PSD1 was the provision in article 3(l) which excluded:

> Payment transactions executed by means of any telecommunication, digital, or IT device, where the goods or services purchased are delivered to and are to be used through a telecommunication, digital or IT device, provided that the telecommunication, digital or IT operator does not act only as an intermediary between the payment service user and the supplier of the goods and services.

By excluding payments executed using a digital telecommunications device, this provision was rather broad, especially given that mobile devices such as smartphones are nowadays used to obtain a wide array of goods and services only usable on such devices. The implication of this provision would, therefore, be to exclude any innovative payment schemes which allow mobile operators and users to pay for online goods and services without recourse to traditional payment institutions. Provisions such as this would have explicitly excluded cryptocurrencies given that they mostly operate online, and on digital telecommunications devices as apps on mobile phones.

In summary, PSD1 was widely criticized for not including new technological entrants within the regulatory scope of payment services. Existing and evolving third-party payment providers (TTPs) were resultantly not captured within the scope of 'payment services' nor were they distinguished from payment service providers (PSPs). The difficulties in defining the scope of the PSD, on the one hand, and the list of activities excluded from the scope of the PSD, on the other, made it particularly difficult for consumers to know if their payment transactions benefited from the so-called protections afforded by the PSD.[80] There was also a challenge concerning the grounds for Member State derogation, as demonstrated with the provisions on 'limited network', which were overly wide and vague to defeat the aims of promoting EU harmonisation.[81]

[80] Study on the impact of Directive 2007/64/EC on Payment Services in the Internal Market and on the application of Regulation EC No 924/2009 on Cross-Border Payments in the community. See https://ec.europa.eu/info/system/files/study-impact-psd-annex-13072013_en.pdf accessed 12 February 2019

[81] Donnelly, M., 'Payments in the Digital Market' (2016) 32, *Comp. Law and Security Review,* pp. 827, 829

5.4 PAYMENT SERVICES

The European Commission, in 2013, began a review of PSD1 to "modernise it to take account of new types of payment services", particularly payments which can foster innovation, competition, alternatives for internet payments, and cheaper payments.[82] The EU itself noted the reasons for reviewing PSD1 because rules on the exemptions of several payment-related activities, particularly those provided within a limited network or through mobile phones or other IT devices were transposed by the Member States in different ways, leading to regulatory arbitrage and legal uncertainty.[83] In its explanatory memorandum, the main objectives of PSD are to contribute to a more integrated and efficient payments market, to improve the level playing field for payment service providers, and to protect consumers.[84]

Unlike its predecessor, PSD2 was designed to encourage new players to enter the payment market as it mandates the retail banks to open up customers' accounts, with their consent, to external parties, subject to informed and explicit consent. As it relates to cryptocurrencies, however, it will be interesting to see if cryptocurrencies exchange tokens fit within the legal scope or structural framework of the payments industry. We will now consider in some detail the provisions of the PSD2, especially in relation to payments. First, it will be necessary to ascertain the kinds of services which PSD2 envisions as payment services, thereby ascertaining the new categories of firms allowed to operate or facilitate payments. The objective of such analysis will be to determine how applicable its provisions can be cryptocurrencies and its affiliate service providers. Secondly, we will consider how PSD2 deals with payment obligations of the non-bank intermediaries, and if such provisions can apply to cryptocurrencies service providers such as wallet-providers etc.

[82] Payment Services Directive: frequently asked questions, see file:///Users/mac/Downloads/MEMO-15-5793_EN%20(1).pdf accessed 12 February 2019

[83] European Commission – Fact Sheet, Payment Services Directive: frequently asked questions (January 2018). See: file:///Users/mac/Downloads/MEMO-15-5793_EN%20(1).pdf accessed 12 February 2019

[84] *Ibid.*

5.4.1 Regulated Payment Services and PSD2

It is of import to set out, in the first instance, the categories of activities which amount to 'payment services', on the one hand, and the extent to which the 'negative scope' introduced through PSD1 can provide a regulatory basis for cryptocurrencies payments. In this regard, reference will now turn to the UK equivalent of PSD2 – The Payment Service Regulations 2017 (PSR 2017).

PSR 2017 categorically sets out what amounts to payment services in Part 1 of Schedule 1. It provides eight categories of activities which, "when carried out as a regular occupation or business activity"[85] amount to 'payment services'. These include:

a. services which enable cash to be placed in a payment account.
b. services which enable cash withdrawals from a payment account.
c. services based on payment accounts that aim to execute payment transactions by means of direct debit, credit transfer and card-based payments.
d. activities which enable payment transactions where a credit line covers funds.
e. activities around issuing payment instruments or acquiring payment transactions.
f. activities around money remittances.
g. payment initiation services; and
h. account information services.

This definition poses a few difficulties for cryptocurrencies payments. First, do cryptocurrencies wallets which hold a cryptocurrencies' *value data* constitute a 'payment accounts' for the purposes of this provision? Traditionally, account-based systems serve as depositories for members of the public to hold money. These accounts have received significant legal attention, both under English and EU law. For instance, rules exist rules under the Payment Accounts Regulations 2015 (PAR) which seeks to remove obstacles to customers opening accounts, switching banks both at domestic and cross-border levels, and providing information by which a customer might compare account fees across different banks.[86] As a matter of fact, the Payment Accounts Regulations describes a

[85] Schedule 1, Part 1 (PSR 2017 No. 752)
[86] Payment Accounts Regulation 2015 No. 2038

'payment account'[87] as an account through which consumers can place funds, withdraw cash and execute and receive payment transactions to and from third parties. The emphasis here is, therefore, on how funds placed in such account are utilised. In other words, such funds are placed, can be withdrawn and used to effect payment transactions.

But does this mean that all forms of bank accounts, including mortgage accounts or ISA[88] accounts, can fall within this definition of 'payment account'? Interestingly, not all accounts held in banks are classed as 'payment accounts.' In fact, PAR effectively excludes 'savings accounts, credit card accounts, mortgages and e-money accounts' within its scope of a payment account.[89] Consider also provisions of the Payment Service Regulation which provides describes a payment accounts simply as 'an account held in the name of a payment service user which is used for the execution of payment transactions.[90] Although this provision also places some emphasis on the utility of the account, it does another interesting thing. It pegs its definition of 'payment accounts' to its definition of 'payment service'. This effectively means that a payment account will only be so for the purposes of the Regulations if an authorized third-party service provider provides it. In other words, in addition to what an account is used for, it will also be important that such account is provided by a service provider duly authorised, either as a PSP or otherwise, to provide such payment service. It will be worthwhile to consider whether cryptocurrencies wallets which largely 'hold' cryptocurrencies - *value data* – can be analogous to traditional payment accounts provided by banks.

5.4.2 Cryptocurrencies Wallets: Lessons from US Law

The US Court of Appeals tried to address this issue by using banking concepts to explain the nature of a crypto wallet. They interestingly described such crypto wallets as "analogous to the account number for a bank account, while the 'wallet' is analogous to a bank safe where the money in the account is physically stored."[91] It has to be said, however, that this description of a digital wallet is rather simplistic. Given that only the

[87] Regulation 2: Interpretation of 'payment account'
[88] Individual Savings Account is a class of retail investment arrangements which qualify for special exemptions from income taxation.
[89] Regulation 2: Interpretation of 'payment account' under PAR 2015 No. 2038
[90] Regulation 2: Interpretation of 'payment account' under PSR 2017 No. 752
[91] *United States v Ulbricht*, 858 F.3d 71 (2nd Cir, 2018), 85

private keys to a cryptocurrencies, as opposed to a public key which will be in the possession of the owner, are usually held on a device and in exclusive control of an owner, it is difficult to perceive such holding as 'analogous' to typical bank-customer interactions where the bank would have custody of the actual bank account.

As hinted in our earlier chapter, a digital wallet for cryptocurrencies is essentially a software program which serves as an equivalent storage or deposit facility. A Wallet will usually have a unique identifier number, record the amount of a particular cryptocurrencies 'held' within the wallet and facilitate its receipt of transfers.[92] Although a crypto wallet may be loosely perceived to 'hold' cryptocurrencies, it in fact, does not. From a technical standpoint, a cryptocurrencies wallet is only a software upon which the private keys to a cryptocurrencies' *value data* are recorded, to aid in proving a wallet holder's ownership of a certain amount of relevant cryptocurrencies and to allow a cryptocurrencies owners to sign transactions for its transfer. In other words, a wallet does not contain any cryptocurrency directly[93] but works more like a recorded ledger to reflect the units linked to a private account.

The functionality of crypto wallets entails that a wallet would usually be installed into a device, such as a mobile phone or hard drive of a computer, which remain within the exclusive control of the cryptocurrencies holder, such that if this device were to be lost or damaged, then so too will its contents.[94] The dilemma here is what legal implication losing a wallet would have, both on the owner or the wallet provider. In other words, who should bear the legal responsibility for the loss of cryptocurrencies recorded in a lost wallet? An understanding of how the law deals with liability and responsibility in terms of bank accounts may aid our discussions here of the differences between a cryptocurrencies wallet and a traditional bank account. As it pertains to traditional bank accounts, the orthodoxy is that an account opening creates some debtor-creditor relationship rooted in contract law between the bank and its customer.[95] As such, a bank is legally entitled to

[92] This was held in *United States v Ulbricht*, 858 F.3d 71 (2nd Cir, 2018), 85
[93] Fox, D., and Green, S., *Cryptocurrencies in Public and Private Law* (1st edn, Oxford OUP 2019) 238
[94] See for instance the story of a man who mistakenly lost bitcoins after throwing away his computer hard drive. <https://www.independent.co.uk/life-style/gadgets-and-tech/news/bitcoin-value-james-howells-newport-landfill-hard-drive-campbell-simpson-laszlo-hanyecz-a8091371.html> accessed 12 April 2019
[95] *Foley v Hill* (1842) 2 HLC 28

use funds standing to the credit of a customer's bank account as though it has borrowed those funds from the account holder. Where those funds, for any reason, become unavailable, the courts will generally take the view a customer be entitled to repayment. This idea has metamorphosed into legal principles on deposit insurance aimed at protecting customers.[96]

Perhaps one way to deal with this challenge would be to include wallet-service providers within the framework of E-Money Issuers under the EMR. As such, wallet-service providers would be legally required to obtain the appropriate licence by the FCA as e-money issuers. The challenge with this suggestion is that most wallet-services do not issue cryptocurrencies, although a few exchanges also offer wallet services. In any case, such a measure would not adequately protect all customers, most of whom prefer to store their cryptocurrencies on their domestic drives or cloud services. In any case, a more robust approach is required.

In the UK, the principles of deposit insurance are enacted in the Deposit Guarantee Scheme Regulations 2015.[97] The account provider, therefore, bears most of the liability. In contrast, unlike with bank accounts, a wallet provider is not generally entitled to use the private keys to its ends. It is therefore difficult to see how the relationship between a wallet-provider and a cryptocurrencies owner, given the peculiar nature of wallets, could give rise to a debtor-creditor relationship. To put it more simply, "the fact that one person leaves the keys to his safe with another may give rise to obligations involving the custody of the safe's content, but this act does not create in legal terms a debt owed by the latter to the former."[98]

Also, under English banking law, there are numerous kinds of relationships between the bank and customer. The relationship often depends on the type of transactions or the product/service offered by the bank to the customer. Generally, however, the relationship

[96] Diamond, D., and Dyimbig, P., 'Bank Runs, Deposit Insurance, and Liquidity', (1983), Vol. 91, *J. Polit. Econ.,* pp. 401
[97] Deposit Guarantee Scheme Regulations 2015 No. 486 which implements EU Directive 2014/49/EU
[98] Fox, D., and Green, S., *Cryptocurrencies in Public and Private Law* (1st edn, Oxford OUP 2019) 239

is often rooted in contract,[99] commencing from the date of account opening.[100] However, in special contracts would give rise to a new relationship, one which extends beyond the general contractual relationship. Depending on the terms of this special contract, the relationship could be one of debtor-creditor.[101] However, in other circumstances, the relationship would be treated as one under bailment[102] or a trust[103] where a bank would be treated as a fiduciary acting either as trustee or agent for its customers. In contrast, treating cryptocurrencies using the principles of agency, trust, or debtor will be problematic for a number of reasons.

First, cryptocurrencies exchange tokens are manifestly intangible, and therefore physically non-existent, unlike typical cash. But even more significantly, the digital wallets that help record the ownership of such cryptocurrencies are themselves intangible software only existing as virtual computer codes. To claim that a relationship between wallet-providers or wallets and cryptocurrencies owners can be legally treated the same way as bank-customer relationships will be impossible unless such wallets are legally defined in a way which takes into consideration its peculiar nature and characteristics.[104] In any case, wallets are digital products often under the control of a software designer or company. A question of internet neutrality is raised here. In other words, should such internet service providers be considered as providing a neutral service, and hence, not held liable for specific harms caused to customers by third-parties?

Another one way to resolve this problem would be to rely on contractual obligations. Given that every wallet is a contractual relationship, it is submitted that provisions of

[99] *Tax Commissioner v English, Scottish and Australian Bank* [1920] AC 683

[100] It was held in *Woods v. Martins Bank Ltd* [1959] 1 QB 55 that such a bank-customer relationship commences from the time the bank accepts a customers' instructions even though at the material time there was no account but only a likelihood that an account would be opened afterwards.

[101] *Foley v. Hill* [1848] 2 HL Cas 28, 9 ER 1002

[102] The common law doctrine of bailment describes a legal relationship where physical possession of personal property is transferred from one person to another i.e. from bailor to bailee. Bailment creates certain rights and obligations as the person who is given the property for safekeeping cannot become the owner. As such, a bailor is generally not required to use the property while it is in his possession. See *Volcafe Ltd and others v Cia Sud Americana de Vapores SA* [2018] UKSC 61

[103] The doctrine of trust is an important innovation in property law. It provides for situations where property is placed in the possession of another for the benefit of a third party. See *Foley v Hil*l (1848) 2 HLC 28

[104] Fox, D., and Green, S., *Cryptocurrency in Public and Private Law* (Oxford, OUP 2019) 236

'safe-keeping services' in relation to private keys be utilised to hold a wallet-service provider liable for how private keys are used. Another alternative would be to impose agency obligations, especially where wallet providers or exchanges receive and act on instructions to engage in transactions with cryptocurrencies. In other words, an appropriately worded contract which imposes agency obligations may be useful in addressing this problem. Unfortunately, there are no ways of ensuring that contractual terms which protect customers are included in contracts. In any case, most of the contracts in relation to wallet or exchange services are clickwrap contracts where customers merely click without necessarily reading its terms. I argue that one to overcome this challenge might be provide some form of unification or standardisation in relation to contracts drafted by wallet-service providers.

5.4.3 Cryptocurrencies as a Payment Services

Let us now consider whether cryptocurrencies payments can be considered as a 'payment service' in accordance with the PSR. On this issue, two critical observations become apparent. First, it does appear that Part 1 defining 'payment service' places significant emphasis on the fact that cash must be placed in a payment account. To be clear, will the deposit of cryptocurrencies in a wallet be comparable to the placing of cash into an account? The straight answer is no. Cryptocurrencies are not legally treated as cash. Cryptocurrencies are not cash, albeit, as discussed in chapter II, it functions as money. However, even though cryptocurrencies may function as money, they remain legally unrecognised as cash, fiat or legal tender. That said, when compared with other forms of money, i.e., commercial bank money or electronic money, cryptocurrencies exchange tokens much closely operate like cash. Other than the fact that they are virtual and not issued by central banks, cryptocurrencies, like cash, allow for P2P payments and incorporate some measure of anonymity into payments. Cryptocurrencies have more in common with cash. But they are not cash[105]

[105]http://www.europarl.europa.eu/cmsdata/150761/TAX3%20Study%20on%20cryptocurrencies%20and%20blockchain.pdf

The question of whether cryptocurrencies can be compared with fiat money arose in *Skatterverket v. Hedqvist*[106] where, before carrying out a transaction for the sale of bitcoins, the defendant requested a preliminary decision from the Swedish Revenue Law Commission. The Commission held that "the bitcoin virtual currency is a means of payment used in a similar way to legal means of payment. Furthermore, the term 'legal tender' referred to in Art. 135(1) of the VAT Directive[107] is used in order to restrict the scope of the exemption as regard banknotes and coins." The Commission, therefore, found that bitcoin 'legal tender' only relates to banknotes and coins and not to currencies. On appeal to the Court of Justice of the European Union, it was held as follows:

> The Bitcoin currency, being a contractual means of payment, cannot be regarded as a current account or a deposit account, a payment or a transfer. Moreover, unlike a debt, cheques and other negotiable instruments referred to in Article 135(1) of the VAT Directive, the 'bitcoin' virtual currency is a direct means of payment between the operators that accept it…Transactions involving non-traditional currencies, that is to say, currencies other than those that are legal tender in one or more countries, in so far as those currencies have been accepted by the parties to a transaction as an alternative to legal tender and have no purpose other than to be a means of payment, are financial transaction.

The court made the interesting position that as far as payments are concerned, cryptocurrencies made for a valid payment instrument. However, the court drew distinctions between 'bitcoin' and other forms of payment, particularly the fact that domestic laws do not regard it as currency. However, this fact does not preclude them from discharging payment obligations, in so far as they would be accepted.

The second observation is the emphasis placed on the fact that a payment service must be carried out in a regular occupation. This suggests some form of 'professionality' by those who provide payment services. It is important to ascertain what will amount to 'regular occupation or business' in relation to cryptocurrencies service providers because the implications are that a third party which does not provide such payment services as a 'regular occupation' will likely fall short of the provisions on payment services. Although

[106] [2016] STC 372 Case C-264/14
[107] Vat Directive 2006/112/EC

the PSR does not make expressly stipulate what will amount to regular occupation, it is problematic to argue that cryptocurrencies service providers such as wallet-service providers such as exchanges, miners, processing service providers and users are professionals facilitating payments as a "regular occupation." In reality, cryptocurrencies market participants such as wallet exchange companies are entities whose services, in many cases, are not solely limited to payment processing. The prime participants are, as evidence suggests,[108] constantly evolving to offer a complex mix of services which often include cryptocurrencies development, investments facilitation as in with initial coin offerings (ICOs), and payments intermediation as performed by exchanges. What immediately becomes apparent is that provisions intended to open up payment services to non-banks are problematic, if not impossible, to treat cryptocurrencies payments within the scope of the PSR directly.[109]

It can be concluded, therefore, that cryptocurrencies tokens do not fit within the PSR's narrow meaning of 'payment services.' However, the Regulation conspicuously introduces new forms of payment services provided by Third Party Players (TPPs) who provide two forms of payment services - Account Information Service Providers (AISPs), and Payment Initiation Service Providers (PISPs). It will be instructive to note whether payments facilitated using cryptocurrencies payment tokens can fall into these two additional categories of payment services.

First, let us consider the meaning of 'payment initiation service'. A Payment Initiation Service 'means an online service to initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service

[108] Hileman, G., and Rauchs, M., 'Global Cryptocurrency Benchmarking Study', (2017) Cambridge Centre for Alternative Finance. Available at <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf> Accessed 21 December 2017

[109] HM Treasury Cryptocurrencies Taskforce Final Report (October 2018): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptocurrenciess_taskforce_final_report_final_web.pdf: Accessed 11 February 2019

provider.'[110] Under the EU Directive, a lot more scope is given to this new category of payment service. In that respect, a payment initiation service is defined[111] as:

> Payment service enabling access to a payment account provided by a third-party payment service provider, where the payer can be actively involved in the payment initiation or the third-party payment service provider's software, or where payment instruments can be used by the payer or the payee to transmit the payer's credentials to the account servicing payment service provider.

The above provisions, as it turns out, are intended to enable a customer or payer to log in directly to their transaction account held by a PSP, such as a bank, in order to make online purchases. In other words, under this provision, a non-bank third party who is not traditionally involved with initiating payment transactions can 'initiate' payment transactions. Admittedly, this is a rather drastic change from industry practices where payment only commences where payment instructions are sent to a bank or other payment institution.

The practical implication of this provision is therefore that a payment instrument provided by a third party can directly take funds from a customer's account and transfer same elsewhere without the need of PSOs or an electronic money wallet. Unfortunately, however provisions on payment initiations do not seem to provide clear guidance on the conditions upon which an entity may engage in payment initiation. What is clear, though, is the fact that any such online service will in most cases have to deal with 'payment accounts' held at 'another provider'.

As such, a third-party payment initiation provider will not ideally be in custody of funds on behalf of a payment user, and neither will hold the payment account. For some of the reasons addressed above, it may be difficult to see how this provision would apply to cryptocurrencies service providers such as wallets and exchanges who, in most cases, will

[110] Regulation 2, Payment Services Regulation 2017
[111] Article 4(32) and Paragraph 7 of Annex 1

provide payment services directly to a cryptocurrencies holder. On the other hand, 'account information service' is defined[112] in the following terms:

> An online service to provide consolidated information on one or more payment accounts held by the payment service user with another payment service provider or with more than one payment service provider, and includes such a service whether information is provided:
>
> a) in its original form or after processing: and
> b) only to the payment service user or to the payment service user and to another person in accordance with the payment service user's instructions.

This provision deals with activities in which a payment service provider provides account information services.[113] Through these introductions, PSR significantly affects the payments industry by allowing new categories of competitors in the form of service providers to aid in collecting and providing account information to payments users. This is, for the time being, quite distinct from the nature of services provided by cryptocurrencies service providers. For one, providing information on payment accounts held by a payment user does not directly play a part in payments. It only appears to allow online-based companies to collate the payment information and present such information in a manner satisfactory to payments users.

The two new types of service arguably reflect the recent market trends in internet-based payments and financial technology services. Practically, this provision may lead to instances where consumers develop new relationships with multiple account providers, and more importantly, instances where merchants can incorporate a payment initiation service provided by a PISP into its checkout processes. However, as it relates to payments using cryptocurrencies exchange tokens payments, there remains some measure of uncertainty.

Here, cryptocurrencies payments challenge existing terminology, and as such, excludes from its scope, application and requirements cryptocurrencies payments. However, let us

[112] Regulation 2(1) of the Payment Services Regulations 2017
[113] Interpretation

consider how the PSR addresses the question of 'payment account'. Having discussed in sufficient detail what payment accounts mean in traditional banking law, the aim of analysing the PSR is to ascertain if any new conceptual changes are introduced which may allow crypto wallets to function as 'payment accounts.'

As with its predecessor, PSR 2017 defines a 'payment account' as "an account held in the name of one or more payment service users which is used for the execution of payment transactions".[114] Unfortunately, this definition is not particularly precise as it does not stipulate the kinds of account – be it a savings account, current account, investment account, mortgage account etc. – nor does it stipulate who would hold such account in the name of the service user. In the European Commission's Q&A to PSD1, certain clarifications were made to similar questions. For instance, on whether a mortgage account could qualify as a payment account, the Commission took the position that a mortgage account into which a borrower makes regular payments are not to be considered as payment accounts because the holder of the debt is the lender and, in cases of early repayments, is to also be considered the payee.[115]

In other words, the Commission explained that the definition of payment account covers all accounts where the holder can deposit and withdraw funds without any intervention or agreement of the PSP. This is perhaps somewhat straightforward for cash-based accounts held in traditional banks. But for cryptocurrencies exchange tokens often 'held' in wallets or domiciled in exchanges, as discussed above, it is still problematic to apply these clarifications. This is because, unlike traditional banks, crypto-holders exercise absolute autonomy in relation to how the account is operated and does not have to go through bank processes to deposit or withdraw funds. For instance, with traditional payments, the bank is always involved in all payment transactions, particularly in verifying payment details or processing such payments. With cryptocurrencies wallets or exchanges, a holder of tokens can execute any transaction without needing any intervention from the exchange

[114] Regulation 2(1) Payment Services Regulation
[115] Your Questions on PSD. See: https://ec.europa.eu/info/system/files/faq-transposition-psd-22022011_en.pdf Accessed 21 February 2019

or wallet. The wallet essentially operates as a store, one in which the holder has absolute control.

The FCA in its 2016 guidance handbook expressed the view that when determining whether or not an account is a 'payment account', recourse must first be made to the underlying purpose for which the account is designed or held.[116] The FCA establishes a number of factors necessary to establish the underlying purpose, namely: the functionality of the account i.e. the greater the scope for carrying out payment transactions on the account, the more likely it is to be a payment account; if there are less restrictive features relating to the account such as notice periods for withdrawals; a limited ability to place and withdraw funds unless there is additional intervention; and the extent to which consumers use such account in practice. Following these factors, the FCA has taken the view that 'payment accounts can include, for example, e-money accounts. Admittedly, these clarifications were made pursuant to the provisions of PSD1 and have not taken into consideration the new overarching aims of PSD2. FCA is currently consulting on guidance for cryptocurrencies in order to provide regulatory clarity on activities which may fall within its regulatory remit and clarify FCA expectations for firms carrying on cryptocurrencies activities within the UK, particularly payments.[117]

What has been demonstrated from the treatment of 'payment services' under existing framework is that, particularly as it concerns definitional issues, cryptocurrencies do not fit within the scope of applicability. It is worth noting, however, that despite the narrow legal treatment, studies have shown as discussed in Chapter IV that many online vendors accept cryptocurrencies in discharge of payment obligations online.[118] It therefore makes no difference that existing law does not recognise cryptocurrencies as 'payment services'.

[116] Financial Conduct Authority Handbook see: https://www.handbook.fca.org.uk/handbook/PERG/15/3.html?date=2016-02-03 accessed 12 February 2019

[117] FCA 'Guidance on cryptocurrenciess' *Consultation Paper*, 2019. See: https://www.fca.org.uk/publication/consultation/cp19-03.pdf accessed 23 February 2019

[118] Polasik, M., *et. al.,* 'Price fluctuations and the Use of Bitcoin: An Empirical Inquiry' (2018) available at < https://www.ecb.europa.eu/pub/conferences/shared/pdf/retpaym_150604/polasik_paper.pdf> accessed 12 March 2020

5.5 CRYPTOCURRENCIES AS ELECTRONIC MONEY?

Although it can be tempting to describe cryptocurrencies as electronic money, it is imperative to note that existing framework does not regard it as so. Electronic money operations are generally governed in the UK by the Electronic Money Regulation 2011.[119] But to understand how the Regulation treats electronic money, it is important to first set out the background to its enactment. In its earliest stages, 'electronic money' was widely considered by economists and financial policymakers as constituting a threat to national sovereignty and fiscal powers of central banks.[120] A study by the European Central Bank in 1994 found that a "viable cashless alternative for small amounts will become available, threaten the ability of customers to pay with notes and coins [and] the role of central banks as suppliers of banknotes could theoretically disappear."[121] The Report, therefore, concluded that an introduction of electronic alternatives to cash would be in "contradiction with the legal tender regulations in some EU countries"[122] and be "incompatible with fundamental central bank responsibilities for maintaining the integrity, stability and efficiency of its country's payment system and for the conduct of monetary policy."[123]

Advocating that EU central banks not take a "wait and see" approach to the problems posed by private sector driven e-money, the ECB identified several possible steps which EU central banks could take to "restrict the issuance"[124] of e-money to specific institutions while retaining supervisory control or directly participating in the issuance of such e-money. It is the recommendations from the several studies[125] which informed the enactment of the first E-Money Directive[126] (EMD) by the European Commission in 2000 as the first major attempt to address the perceived risks of e-money.

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[119] 2011 SI No 99, implementing Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009.
[120] Kobrin, S., 'Electronic Cash and The End of National Markets', (1997), Vol. 107, *Foreign Policy,* 60, 71
[121] The European Central Bank Report to the Council of European Monetary Institute, (1994) pp. 7: See <https://www.ecb.europa.eu/pub/pdf/other/prepaidcards1994en.pdf> Accessed 3 March 2019 [29
[122] *Ibid*.
[123] *Ibid*.
[124] *Ibid*.
[125] European electronic money proposals on clear regulatory framework (1998) ip/98/727 < http://europa.eu/rapid/press-release_IP-98-727_en.htm?locale=en> [Accessed 1 March 2019]
[126] Directive 2000/46/EC

The Directive set up prudential supervision of e-money businesses and institutions and reserved issuance of 'e-money' to "electronic money institutions" (EMIs)[127] and banks.[128] Under the Directive, EMIs were subject to several restrictions such as only carrying on financial services of issuing and administering electronic money without issuing credit; [129] limitations on investments;[130] and not holding any other undertakings except in performance of operational functions related to e-money.[131] Similarly, EMIs were required to have an initial capital of EUR 1 million;[132] to have sound and prudent internal control mechanism; and prudent administrative, management and accounting procedures.[133]

Also, as part of its prudential supervision mechanism, the EMD required that every EMI be verified and supervised by a competent regulatory authority within member states[134] which could waive the application of some or all provisions of the Directive.[135] The EMD, however, failed to spur the growth of the e-money sector at the time[136] and activity "fell far from reaching its full potential." [137] In its reassessment report, the European Commission concluded that although the EMD encouraged market entry by non-bank institutions, restrictions imposed by the EMD coupled with the uncertain and inconsistent application by member-states hindered the development of the market and dampened consumer confidence in e-money.[138]

The EMD was repealed and replaced by a second EMD in 2009[139] ("2EMD") to resolve the issues identified by consultations on its implementation. The major objectives of the

[127]Article 1(1) Directive 2000/46/EC
[128]Article 1(3)(a)
[129]Article 1(5)(a)
[130]Article 5
[131]Article 1(5)(b)
[132]Article 4(1)
[133]Article 7
[134]Article 6
[135]Article 8
[136] Pen, B., 'Commission Consults on Revision of the European Electronic Money Regime' (2005) 13 (4) *Journal of Financial Regulation and Compliance,* Pp. 347, 348
[137]Evaluation of the E-Money Directive Final Report: See < http://ec.europa.eu/internal_market/payments/docs/emoney/evaluation_en.pdf> [Accessed 23 July 2015]
[138]Ibid.
[139]Directive 2009/110/EC of the European Parliament

2EMD were to take cognizance of technological changes in the payments industry; promote innovation of new and secure 'electronic money' products; reduce barriers to entry by increasing market competition, and to modernize the rules for e-money and harmonize them with other payment regulations, and modernise the provisions of the First Directive. In the UK, the Electronic Money Regulations 2011[140] (EMR) implements provisions of the 2EMD alongside other legislations which regulate payment services. The EMR mainly stipulates procedures for becoming an electronic money institution ("EMI");[141] creation of small EMIs;[142] enabling the inclusion of agents of an EMI in the EMI register;[143] enabling the FCA to give directions regarding applications, authorization and registration cancellations. Let us now consider its provisions, especially as it may relate to cryptocurrencies payments.

Returning to the question posed earlier – 'does the law regard cryptocurrencies as electronic money?' let us consider how the EMR defines 'e-money'. According to the regime, 'electronic money' is:[144]

> Electronically stored monetary value as represented by a claim on the electronic issuer which (a) is issued on receipt of funds for the purpose of making payment transactions, and (b) is accepted by a person other than the electronic money issuer.

By this definition, 'electronic money' is when monetary value is stored on a device issued by an 'electronic money issuer' in return for funds and which not only gives rise to claim for the return of those funds from the issuer but can be used as a means of payment with persons other than the issuer. In this sense, electronic money is being described as a 'surrogate' to coins and banknotes.[145] In practice, therefore, there are two broad types of 'electronic money'.[146] One type is the 'electronic purse' or 'digital wallet' which is usually capable of being pre-loaded with monetary value and issued independent of any bank

[140]Electronic Money Regulations 2011, SN 2011 No. 99 pursuant to the Financial Services and Markets Act 2000
[141]Article 1(2)(a)1
[142]Article 1(2)(a) ii
[143]Article 1(2)(a)iii
[144] Regulation 2(1) Electronic Money Regulation 2011, SN No 9
[145] Electronic Money Regulation, Recital 18
[146] Cranston, R., *et al 'Principles of Banking Law'* (3rd Edition OUP 2017) pp. 366

account for the purchase of a limited category of goods and services. Most of such cards are installed on mobile devices such as *ApplePay.* The second type of electronic money enables a person to move funds from a bank account to an internet-based account. A good example of this form of electronic money is *PayPal* which not only provides payment services but also provides some levels of guarantees such as repayments in cases of misdirected payment instructions when a payment transaction is incomplete or defective.

What immediately becomes apparent with regards to electronic money is the fact that it further adds to the complexity of payment relationships. In other words, the intermediaries between a payer and payee not only just includes a bank but may now extend EMIs who are mostly non-bank providers of card services such as, for instance, Apple or PayPal. But how are our electronic money issuers, particularly of the first category, different from crypto wallet providers? In most cases, cryptocurrencies wallets are also often installed on mobile devices and used to perform payment operations. The difference lies, perhaps, in how the law opts to treat 'electronic money.'

There are two distinct propositions suggested in the definition of 'e-money'. First, the law seems to promote technological neutrality by not stipulating that an e-money instrument or 'token' meet any pre-determined technological parameter. In other words, the determination of what amounts to 'e-money' is not restricted to any one form of technology. As such, it does not particularly matter if the payment token takes the form of a prepaid card, a mobile phone application or online application. Little needs to be said here, especially as it relates cryptocurrencies payment tokens which take the form of data, comparable with central and commercial bank monies which are essentially computer data records.[147]

Secondly, and perhaps more importantly, a token or instrument is 'e-money' only if a licenced 'electronic money issuer issues it'. In accordance with provisions of the EMR, an electronic money issuer must be authorised by the FCA[148] upon meeting certain

[147] Rahmatian, A., 'Electronic Money And Cryptocurrencies (Bitcoin): Suggestions For Definitions' (2019) 34(3) *Journal of International Banking Law and Regulation,* pp. *115*
[148] Regulations 5 of Electronic Money Regulation 2011

conditions such as the minimum capital[149] and 'own fund' requirements. In effect, the legal difference between cash money or fiat currency and 'electronic money' is indeed determined by the origin and authority of the issuer or creator of that money. As such, although cryptocurrencies and 'electronic money' may well be technically similar, their legal characterization differs significantly. On the one hand, electronic money is essentially regulated digital monies which are issued by central banks, commercial banks and authorized EMIs, while cryptocurrencies, on the other hand, are privately 'created' digital monies which are not necessarily authorised or regulated. This makes the concept of 'electronic money' a question of labelling since the terminology is not particularly stringent in any particular direction. That said, the technical method of creating cryptocurrencies units (its value data) is significantly different from how electronic money is 'issued' i.e. by the creation of debt reified in the form of banknotes and coin. But to answer the question of whether 'electronic money' is money, it is legally irrelevant how it has been created – either by the creation of a debt or not. What matters is whether the law recognizes it as money, in the first case, and whether such money originates from a legally authorised issuer, in the second.

The conclusion, following from the above, is, therefore, that for cryptocurrencies to fit into the scope of electronic money in accordance with the EMR, it needs to be legally recognised as money; and it has to be determined whether the creation of cryptocurrencies through 'mining' meets the legal tests of 'issuance,' i.e. whether it originates from a legally authorized issuer. On the first question, it is now settled that although cryptocurrencies do function like money, they, in fact, to do not constitute 'money' within a traditional legal sense since they are not legal tender. On the question of whether cryptocurrencies can be considered as coming from an authorized issuer, it could be answered 'yes' and 'no' depending on the context and circumstances. Given that cryptocurrencies are often generated by mining or purchased directly from other users, it is highly unlikely that such activities can be subject to an e-money licence application. To date, Coinbase Ltd is the only cryptocurrencies service provider licence to provide any e-

[149] Regulation 6 Electronic Money Regulations 2011

money services within the UK. However, its e-money licence is limited to e-money storage services and enable users to receive e-money payments.[150]

Notwithstanding the fact, therefore, that a unit of cryptocurrencies can be bought with conventional fiat money, in most cases such transactions are not immediately revisable upon request. In contrast, the EMR provides that an electronic money issuer must "on receipt of funds, issue without electronic delay money at par value; and at the request of the e-money holder, redeem at any time and par value the monetary value of the e-money held."[151] This throws up questions of liability. Let us now consider whether provisions of the EMR could address questions of liability and obligations as earlier discussed under orthodox banking law rules.

5.5.1 Crypto payments: Reversibility and Convertibility.

One critical point to note is that of 'reversibility' and 'convertibility'. The EMR provides as follows:[152] "An electronic money issuer must (a) on receipt of funds, issue without delay electronic money at par value; and (b) at the request of the electronic money holder, redeem: (i) at any time; and (ii) at par value, the monetary value for the electronic money held."

It provisions imply, for instance, that an electronic money holder can, at any time, request that funds deposited with the EMI in exchange for the e-money be converted back to fiat. In other words, the EMR here lays down that e-money must always be convertible at the same value. Assuming for a moment that cryptocurrencies can be categorised as e-money, though this has been earlier shown to be unlikely, let us consider the implication and applicability of such convertibility on cryptocurrencies payments. This would go to the heart of the issue whether cryptocurrencies units confer any rights or claims on the holder as against who such cryptocurrencies have been purchased from. Or against the crypto service providers such as mining or exchange companies who have sold cryptocurrencies to a holder. With respect to instances where a person's mining activities generate such

[150]See <https://www.coinbase.com/legal/user_agreement?country=uk> accessed 21 March 2019
[151] Regulation 39(a) and (b) Electronic Money Regulations
[152] S 40, Electronic Money Regulations

convertible cryptocurrencies exchange tokens, such person cannot reasonably be characterised as having obtained the crypto units by exchanging bank money or fiat currencies. In other words, it would be difficult to attribute cryptocurrencies mining activity as 'issuing' money legally. At the heart of this is the legal concept of 'issuing'.

The EMR does not provide any further guidance or provisions on what it means to issue e-money. But let us consider the provisions of the PSR which provides an interpretation of 'issuing of payment instruments.' It provides that "issuing of payment instruments means a payment service by a payment service provider contracting with a payer to provide payment instruments to initiate payment orders and to process the payer's payment transactions."[153] The approach taken by both provisions is to tie the quality of the payment instrument issued to the licencing regime, either as an electronic money issuer or as a payment service provider. As such, if an entity is duly licenced as an EMI or PSP, then such entities would be legally entitled to issue or provide payment instruments. This is reminiscent of a legal concept of money, closely linked to legal tender rules and state theory of money. In the absence of being issued with an e-money licence or meeting the conditions to provide payment services, a cryptocurrencies payment service provider, whether it be a miner, a wallet service provider or an exchange company, will be legally unable to issue e-money

Given the above, it will be impossible to require convertibility, especially when the funds exchanged for the cryptocurrencies are not necessarily paid into a licensed EMI. Bitcoin, for example, imposes no obligation on a seller of the mined tokens to refund money exchanged in the process of purchase upon a request of the buyer.

The next question bothers on reversibility. In traditional payments, as discussed above, a payment instruction can be countermanded or revoked if done in accordance with express contractual terms between payer and payer's bank. However, in contrast, cryptocurrencies are designed to be technically irreversible. In other words, once a cryptocurrencies payment transaction has been initiated and verified by its network community, it becomes

[153] Regulation 2(1) of the Payment Services Regulation 2017

impossible to reverse such a transaction. The implication is therefore that if a payer misdirects a payment instruction, for instance, or sends bitcoins to the wrong address, it would be technically impossible to override the system and reverse the said payments.[154]

The second aspect relates to a requirement that an 'electronic money issuer issue such as electronic payment products or tokens'. This is a critical issue. Indeed, issuing e-money is a regulated activity under the 2EMD and may be carried out only by the properly authorized legal entities. Accordingly, only authorised electronic money institutions; small electronic institutions, European Economic Area (EEA) authorised electronic money institutions; credit institutions; Post Office Ltd; Bank of England, ECB; government departments and local authorities acting as public authorities; credit unions; municipal banks; and National Savings Bank can issue e-money.[155] The regulator, which is the FCA in the UK, is required to authorize the issuance of e-money by any institution and/or maintain a register of all such e-money institutions.[156]

In conclusion, after considering these foundational provisions of both PSR and EMR, it is highly unlikely that cryptocurrencies payments fall within the scope of both legal frameworks. The FCA recognizes that although cryptocurrencies can be used and are used to facilitate payment, particularly international remittances, it still falls outside the remit of existing payment frameworks.[157] However, perhaps, given that cryptocurrencies bear technical similarities with e-money, certain forms of cryptocurrencies could qualify to constitute e-money is appropriately re-designed to fit within the technical parameters of 'e-money'.

From the survey of all the provisions above, it is now clear that cryptocurrencies, while on a practical level, are at odds with traditional banking payments, they do have a good deal to learn from banking rules on payments. What is also clear is that the rules as they

[154] The Guardian, 'Virtual reality hit when I tried to cash in my bitcoins', 26 July 2017. Available at <https://www.theguardian.com/money/2017/jul/26/sell-bitcoins-hsbc-block-account> accessed 11 January 2019
[155] Art. 2
[156] Art. 4(1)
[157] Financial Conduct Authority, 'Guidance On Cryptocurrencies' Consultation Paper, 2019. See: https://www.fca.org.uk/publication/consultation/cp19-03.pdf accessed 23 February 2019

apply from one context to another may require some adaptation in order to be fit for purpose. It might be better to reconsider new forms of rules, particularly around contract law, which might be better suited to holding wallet service providers and exchange companies responsible in times of loss. In our next chapter, we will now consider the building blocks of rules which can be moulded into this new regulatory regime.

So important that some would readily argue that to rely on an alternative system will make payments less secure, generally inconvenient, and impractical.[158] To be clear, it is not suggested here that a blockchain-run system of cryptocurrencies payments should supplant the existing payment system. Rather, crypto payments arguably add significant value to the existing payments system, not least by democratising payments, improving efficiency, enhancing transparency and providing an electronic equivalent of cash. That said, let us consider how the existing payment system works in practice.

5.6 CONCLUSION

This chapter has outlined the practical realities of how the payment system works in the UK, particularly pinpointing the roles played by all operators. The complex ecosystem of UK payments is dominated by payment service providers, operators the regulators. Despite many technological advancements in the payments sector, the traditional participants have not changed much. These systems underpin the digital payment infrastructure provided by banks and other financial institutions. Over the years, the UK payments system has grown into a long established and trust method of making and receiving payments. However, long processing times, fees for transactions and inflexible cut off times have been a challenge. More critically, the payments system operates with trusted third-parties who unfortunately tend to be susceptible to manipulative powers of the state. As such, issues such as excessive surveillance grant financial intermediaries with a vast powers over which there is little control or scrutiny.

[158] Haldane, A., and Latter, E., 'The Role Of Central Banks In Payment Systems Oversight' (2005), 45(1), *Bank of England Quarterly Bulletin*, pp. 66–71.

The chapter has also critically analysed the framework for payments in the UK, particularly provisions of the Payment Services and Electronic Money Regulations, respectively. The aim of our analysis in this regard was to identify how legal rules address specific issues, particularly those in relation to payments processes, the liability of actors and protection for users. Also, our analysis considered the definitional boundaries set up in the existing framework, which poses barriers for cryptocurrencies payments. In addition to considering statutory provisions, this chapter also explored several common law rules in relation to payments, especially reflecting the attitude of the courts in resolving issues unaddressed in statutory law. In many of these legal provisions, I have tested the compatibility of cryptocurrencies payments, especially following our discussions in the previous chapter. On most issues posed in the earlier chapter, the existing framework seem incompatible.

I argue that this incompatibility is not unintended, however. As suggested under LTF, the instrumentality of law is never intended to serve all participants in the same manner. It is elastic by design and only adapts insofar as the changes sought to be introduced in the interest of the apex of the financial system. This elasticity is, however, suspended in relation to the periphery of the financial system. And as has already been established, cryptocurrencies are currently at the apex of this hierarchical system, its advancement to the apex of the money hierarchy will only be aided by legal instrumentality when it aligns with the interests of those at the apex of the financial system. Evidence of this selective elasticity, which *Pistor* describes as the "law-finance paradox"[159] can be found within the reasons for the introduction of the Electronic Money Directive. In 1998 the European Commission proposed the enactment of the first Electronic Money Directive with the aim of "harmonising minimum rules for ensuring that institutions issuing money are stable and sound." The proposed new Directive was also to facilitate the development of electronic commerce within the EU and ensure a level playing field between traditional credit institutions and other firms issuing electronic money. It, therefore, allowed electronic

[159] Pistor, K., 'The Legal Theory of Finance' (2013) 40, *J. Comp. Econ.,* pp. 351, 323

money institutions to offer their services throughout the EU based on supervision by their home Member State.[160]

It is important to observe that the introduction of this legal instrument to lend validity to the emerging e-money technology was a response to the range of electronic purses developed in the 1990s, mainly by existing payment providers, banks. These digital purses, which have now evolved into prepaid bank cards, were intended to replace physical coins and banknotes, and the expectation was of rapid adoption. The European Monetary Institute (EMI), the predecessor of the European Central Bank, made recommendations for the issuance of these products in the EU, but be confined to deposit-taking institutions.[161] As a result, the EMD lent credibility by casting the benevolent glow of coercive enforceability over them. I would argue that the haste with which legal instruments were enacted to justify bank cards were exclusively meant only to protect the interests of those who exercise power within the existing structure. And in this regard, cryptocurrencies are still considered as outsiders occupying the periphery, hence not entitled to benefit from the provisions of existing payments framework.

Given that cryptocurrencies, as demonstrated throughout this thesis, constitute a recognisable form of payment, there is no reason to discriminatorily distinguish them from 'electronic money' or 'payment services'. To do so provides an inconsistent response to the substantively similar payment transactions of cryptocurrencies and to undermine parties' legitimate expectations, especially in relation to rights and liabilities of payment parties and the evolving crypto-ecosystem. The critical question to explore now is how this new emerging technology should be regulated or governed. Themes on the development of governance frameworks are addressed in the next chapter.

[160] EC, "Electronic Money: Commission Proposes Clear Regulatory Framework' (1998) available at <https://ec.europa.eu/commission/presscorner/detail/en/IP_98_727> accessed 1 March 2020.

[161] Working Group on EU Payment Systems, 'Report to the Council of the European Monetary Institute' (May 1994) available at < https://www.ecb.europa.eu/pub/pdf/other/prepaidcards1994en.pdf> accessed 1 March 2020

CHAPTER VI

CONSTRUCTING A BETTER GOVERNANCE FRAMEWORK

"We have only one real currency in the USA, and it is stronger than ever, both dependable and reliable. It is by far the most dominant currency anywhere in the world, and it will always stay that way. It is called the United States Dollar!"[162]

6.1 INTRODUCTION

In chapter V, a critical analysis of the legal framework for payments under English law was undertaken. Although there are robust provisions governing payments, particularly those conducted electronically via the banking system, the analysis examined their suitability to address the cryptocurrency related issues identified earlier on in the thesis. It was argued that existing frameworks, even where designed to cater to electronic payments, are insufficiently equipped to adequately respond to the myriad of issues associated with cryptocurrency. The chapter concluded by proffering a theoretical explanation for this legal incompatibility, in line with suggestions of the legal theory of finance. In effect, by providing vindication to emerging financial instruments, law plays a vital role in constituting finance.

Furthermore, given that newer financial instruments are always surfacing onto the finance scene, law has taken on an elastic character, often been deployed by major financial stakeholders to provide continuing vindication to new problems. The paradox however is that, although law's elasticity was once used to vindicate electronic money instruments issued by commercial banks in the early 90s, the same elasticity has not been activated to provide legal vindication for cryptocurrency. The explanation for this selective use of law, it is argued, is evident in dynamics of power and position in relation finances hierarchical structure. Cryptocurrencies sit at the lower end on the hierarchical structure of finance, being used and operated by private 'un-franchised' entities such as the crypto wallet and exchange companies.

[162] Donal Trump, President of the United States, <https://twitter.com/realDonaldTrump/status/1149472285905940480> accessed 21 January 2020

Building on from those conclusions, this chapter critically evaluates the different proposed frameworks and ideas for addressing the cryptocurrency question. After over a decade since its introduction, public adoption of cryptocurrencies have been underwhelming. According to a recent study by the Foundation for Interwallet Operability (FIO), over 60% of cryptocurrency holders do not feel comfortable or confident in using it for their online payment needs.[163] Despite rumours, popular e-commerce websites like Amazon are yet do not accept cryptocurrency in discharge of payment obligations,[164] although a small number of online merchants, including Microsoft, provide limited scope of online services for which cryptocurrency payments are acceptable.[165] On balance, though, widespread acceptability of cryptocurrencies payments is far from realised.[166] In addition to hesitation by online retailers to accept cryptocurrencies, it is often argued that the absence of an appropriate, coherent, clear and consistent set of legal rules significantly contribute to unrealised widespread public adoption.

Furthermore, as demonstrated in Chapters IV and V, there is political debate to be had in relation to cryptocurrency. Given that regulatory intervention is broadly based in political ideology, the reluctance by western countries, including in the UK, to adopt or provide legal vindication which puts cryptocurrencies payments into mainstream payment systems indicates this need to engage with the ideological questions as well. Issues such as price volatility occasioned by market manipulation, conflict of laws, criminality and consumer exploitation have so far been left unaddressed, leaving the appeal and future of cryptocurrencies in doubt. Without a coordinated and consistent regulatory framework, financial service and technology firms have had to navigate a complex quasi-regulatory

[163] Blockchain Usability Report (2019). Available at < https://fio.foundation/wp-content/themes/fio/dist/files/blockchain-usability-report-2019.pdf> accessed 21 January 2020

[164] When Will Amazon Accept Bitcoin (2020). Available at <https://www.investopedia.com/articles/company-insights/090216/when-will-amazon-accept-bitcoin-amzn.asp> accessed 12 February 2020

[165] 'How to Use Bitcoin to Add Money to Your Microsoft Account' (2018) Available at <https://supp.ort.microsoft.com/en-us/help/13942/microsoft-account-how-to-use-bitcoin-to-add-money-to-your-account> accessed 14 February 2020

[166] Zeynep, G., and Knottenbelt, W., 'Cryptocurrencies: Overcoming Barriers To Trust and Adoption' (2018) available at <https://www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/ic3re/CRYPTOCURRENCIES--OVERCOMING-BARRIERS-TO-TRUST-AND-ADOPTION.pdf> accessed 11 March 2020

environment. It will therefore be important to critically assess what impact each proposed governance approach will have. This thesis takes the approach that the protection of this innovation is paramount, and any proposed governance framework must safeguard its continued development while provide protections for users and potential innovators. Regarding self-regulation, as demonstrated in our discussions on regulatory interests in Chapter III, profit-driven interests may provide competition which ultimately improves innovation, but they can have adverse consequences for early users or existing systems.

6.2 INTERVENTIONIST APPROACHES

From our earlier discussions on money, it is indisputable that the state, for much of history, has wielded control over the issuance and operations of payment instruments, whether as metals stamped by a monarch's likeness, banknotes depicting political leaders or commercial bank money.[167] But the state also has, as recent financial collapses suggest, mismanaged its monopoly on money with significant economic consequences. Attempts to formulate suitable governance frameworks for the global cryptocurrency ecosystem has been faced with one major problem – the trust problem. Governance proposals struggle to strike an appropriate balance between a centralised public-driven model of trust from the decentralised, private-driven model. More than any other time in history, technological platforms such as Facebook and Twitter have totally redesigned how the marketplace operates, most presenting a unidirectional model of business where both consumers and providers of goods or service maintain unique interactions on such platforms. These new market models are unlike the traditional two-way market systems where providers of goods and services enter into direct or indirect two-way interactions with customers.[168]

Cryptocurrencies technology is just one example of how technology is disrupting payments. This section identifies and critically engages the different perspectives on the crypto-governance spectrum. To sufficiently undertake this task, it will be necessary to recognise the 'choke points', the merits prevalent in each critical perspective and implications of each proposal. For this purpose, I group existing governance proposals

[167] Refer to our discussions in Chapter II on the historical and theoretical underpinnings of money.
[168] Khan, L., 'Amazon's Anti-Trust Paradox' (2017) Vol. 12(3), *Yale Law Journal,* pp. 710

that have thus far been suggested in academic debate into three broad categories reflecting the tensions between private and public approaches to financial regulation.

First, a majority of academic debate suggest regulatory intervention which only targets aspects of cryptocurrencies, in a somewhat fragmentary manner.[169] Such 'fragmented governance models' propose specific controls over problematic aspects of cryptocurrencies, particularly anonymity in facilitating criminal activities like tax evasion and money laundering. Another particular aspect which often recommended for targeted intervention is the realm of code engineering, to control those who build the platforms and protocols upon which the distributed ledgers are run. Also, some suggest targeting the payment network, particularly node operators, wallet providers, exchange service providers, cryptocurrencies miners or users.[170]

A second set of suggested approaches argue for a form of self-regulation, requiring the creation of better cryptocurrencies or 'stable-coins' which incorporate into the cryptocurrency design solutions to problems associated with first-generation cryptocurrencies.[171] For ease of reference, this thesis groups such ideas into a 'corporate-focused interventionist model.' Proposals by Facebook to create a new "simple global currency and financial infrastructure that empowers millions of people" is an excellent example of corporate-focused intervention to solving cryptocurrencies problems.[172]

Thirdly, there are calls for governments to exert their control on payments by directly intervening into crypto-governance. In relation to payments, Governments usually indirectly intervene through monetary regulators using tools which range from oversight or supervisory powers; capital eligibility requirements which set out entry access

[169] Twomey, P., 'Halting a Shift in the Paradigm: The need for Bitcoin Regulation' (2013), Vol 16, *Trinity C.L. Rev*., pp. 67, 70; Bradbury, D., 'The Problem With Bitcoin' (2013) 11, *Computer Fraud & Security,* pp. 5; Engle, E., 'Is Bitcoin Rat Poison? Cryptocurrency, Crime and Counterfeiting (CCC)' (2016) 16, *Journal of High Technology Law,* pp. 340; Fromkin, M., 'From Anonymity to Identification' (2005) 1, *Journal of Self-Regulation and Regulation,* pp. 900-909

[170] Edwards, L., (ed) *Law, Policy and The Internet* (Hart Publishing 2019)

[171] Dell'Erba, M., 'Stablecoins in Cryptoeconomics From Initial Coin Offerings to Central Bank Digital Currencies' (2019) 22 *NYU J. Legis. & Pol'y,* pp. 1-10; Israel Lazcano, 'A New Approach for "Cryptocurrencies" Regulation' (2019) 35(1), *Banking Law Review,* pp. 37

[172] "An Introduction to Libra" available at https://libra.org/en-US/wp-content/uploads/sites/23/2019/06/LibraWhitePaper_en_US.pdf> accessed 21 January 2020

requirements; or comprehensive assessments through stress-testing frameworks. However, by directly participating in crypto-governance, the state is being called upon to consider creating a state-virtual currency to complement, substitute or exert competitive force on cryptocurrenciess.[173] The state could, therefore, in principle, issue state cryptocurrenciess or digitise fiat money into Central Bank Digital Currencies (CBDC). The Bank of England is currently considering such proposals.[174]

6.2.1 Fragmented Governance Approach: Anonymity, Crime and Democratic Values

A great deal of the attention given to cryptocurrencies revolves around the anonymity which it lends to users. As discussed in chapter III, unlike other forms of electronic payments which significantly rely on 'trusted' intermediaries to facilitate transactions, cryptocurrencies are not typically tied to bank accounts or personal identities. Also, crypto-wallet holders are generally not required to provide personal identification before acquiring wallet accounts in the same way as persons opening bank accounts would.[175] Except for cash, cryptocurrencies payments are fundamentally different from other online or electronic payments for which information requirements often apply. In practice, this means transactions recorded on crypto's DLTs provide no direct links to individuals, and because transacting parties cannot know each other's identities, payments remain primarily anonymous, albeit not untraceable.[176]

As an integral feature of cryptocurrencies, anonymity fuels concerns, not least from monetary regulators such as the Financial Conducts Authority (FCA)[177], that 'identity-less' payments pose threats to society. Anonymity often gets blamed for criminal

[173] Hossein, N., 'Central Bank Digital Currencies: Preliminary Legal Observations' (2019), *Journal of Banking Regulatio*n, Forthcoming. Available at <https://ssrn.com/abstract=3329993>
[174] Barrdear, J., and Kumhof, M., 'The Macroeconomics of Central Bank Issued Digital Currencies' (2016), Bank of England Staff Working Paper No. 605. See < https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2016/the-macroeconomics-of-central-bank-issued-digital-currencies>
[175] Houben, R., 'Bitcoin: There Are Two Sides To Every Coin' (2015) 26(5), *International Company and Commercial Law Review*, pp. 155, 158
[176] Grinberg, R., 'Bitcoin' (2011) 4, *Hastings Science & Technology Law Journal*, pp. 160, 164
[177] Financial Conduct Authority, 'Cryptocurrencies Taskforce: Final Report' (October 2018) See <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptocurrenciess_taskforce_final_report_final_web.pdf> accessed 12 January 2020

behaviours such as online trade in illicit items or using it for financial impropriety like money laundering or tax evasion. In response to these concerns, many have called for a governance framework which specifically axes anonymity and forces users to reveal their identities during cryptocurrencies payment transactions.[178] Axing crypto anonymity, it is often claimed, will be ultimately beneficial to advancing cryptocurrenciess into wider public adoption.

Regardless of the view one takes on the significance of anonymity to public adoption of cryptocurrenciess, a few critical questions need addressing. First, it is essential to understand how curtailing anonymity will address the challenges posed by cryptocurrenciess payments, particularly apportioning legal liability for loss; safety and reliability of payments; consumer protection from fraud; and payments processing issues, *et cetera*. Secondly, questions of practicality ought to be examined. For instance, is it technically possible to 'shave off' anonymity from internet protocols like cryptocurrenciess? Are there existing legal instruments which already successfully address anonymity from an internet-usage perspective? What impact will a 'de-anonymised' cryptocurrencies payments system have on the advancement of this innovative technology and acceptability? This section addresses these questions by evaluating critical and contrasting perspectives on anonymity.

6.2.1.1 Critical Perspectives on Anonymity

Generally, anonymity presupposes that something is shrouded in secrecy or undertaken without revealing personal identity. However, when discussed within the contexts of internet usage or finance, anonymity becomes a rather complex concept serving completely different purposes. Given that cryptocurrencies payment technology conveniently falls within the intersection between finance and internet technology, it will be essential to conceptualise anonymity in a manner which reflects a convergence between both perspectives. Our task here, therefore, is first to construct a useful framework for

[178] Zingales, N., 'Virtues and Perils of Anonymity: Should Intermediaries Bear the Burden' (2014) 5, *J.I.P.I.T.E.C.*, pp. 1

understanding anonymity for financial technology; and assess its value, especially in relation to cryptocurrencies payments.

In the context of internet usage, anonymity is perceived loosely as serving two interconnected but distinct purposes. Firstly, it serves a distinctive role within the technical construction of internet platforms. Secondly, it becomes a technological tool for responding to social perceptions of internet usage.[179] As a 'brick' in the creation of internet platforms, anonymity fosters "non-traceability" to make sure users are not required to prove identity. By their very nature, this feature makes internet interactions possible. In this sense, anonymity is said to play a critical role in making internet tools widely accessible. For instance, new email users are typically only required to provide general information as part of account setup without requirements to supply supporting evidence in proof of more general information. To request new email users to present government-issued identification would put up barriers to access to those who do not have such ID.

Taking this argument even further, proponents of technological anonymity often conclude that it is indispensable. Without in-built anonymity written into design codes, online protocols and solutions would be cumbersome to operate, inaccessible and less appealing. As *Lessig* put it, "anonymity makes it technically possible for individuals to send messages or interact over the internet without any possibility of such messages or interactions being tied to persons."[180]

Also, anonymity serves a second and non-technical role, one which provides a credible response to social pressures and perceptions of internet usage. Beyond using internet protocols, it is argued that it plays a critical role in guaranteeing citizens' participation in democratic interactions which aim at social mobilisations, especially contrary to the typical social need for identification in circumstances where such identities would compromise public engagement.[181] The case made here is that anonymity has a social value quite distinct from its technical role. It affords protection from socially awkward

[179] Lessig, L., *Code: Version 2.0* (Basic Books 2006) pp. 35
[180] *Ibid.*
[181] Zingales, N., 'Virtues and Perils of Anonymity: Should Intermediaries Bear the Burden' (2014), Vol. 5, *J.I.P.I.T.E.C.*, pp. 1,

situations and potential state-directed sanctions against individuals attempting to engage with institutions of state such as 'whistle blowers'.[182] In this sense, anonymity is useful in a technical and non-technical way.

The discourse above allows for a few observations. First, adjudging the value of anonymity solely from a technical or quasi-technical perspective is somewhat problematic, if not restrictive. Suggesting that anonymity is an essential design feature necessary for building internet protocols is contradictory in terms, especially given that in certain circumstances this 'indispensable' anonymity can be removed, modified or even curtailed. How can anonymity be an 'essential building block', but yet also removable? For instance, although new Facebook subscribers are not typically required to verify personal details, such requirements become imposed where users try to make purchases, donations or any engage in other financial dealings.[183] It must therefore mean that, in the case of Facebook, anonymity is not a fundamental feature of its code. Instead, it's a design choice which such platforms provide if it serves their overall interests.

Also, anonymity is said to be socially beneficial because it provides a useful tool for engaging in online interactions against social predispositions towards identification. But surely, this social benefit theory is defeated when we consider that online protocols have become the main instruments for privacy invasion and data breaches. It is irreconcilable to argue that online platforms with inbuilt anonymity also provide social benefits, when in reality, it is these platforms that directly or indirectly undermine those social values in question. Consequently, I would argue that it is somewhat misleading to present anonymity as a permanent indispensable feature of online protocols. Instead, I take the view that in-built anonymity is merely a design choice deliberately incorporated into internet protocols to achieve set objectives, whether to drive up subscriptions, increase appeal or maximise profits. This means that, if de-anonymised internet protocols were to

[182] *Ibid.*

[183] In its Data Policy, Facebook stipulates instances where identification details will be taken. "if you use our products for purchases or other financial transactions (such as when you make a purchase in a game or make a donation), we collect information about the purchase or transaction. This includes payment information, such as credit or debit card number and other card information, other account and authentication information, the billing, delivery and contact details." See < https://www.facebook.com/about/privacy/update> Accessed 21 January 2020

become advantageous to the 'bottom-line', internet designers could deliberately exclude anonymity. The choice element of anonymity re-enacts our earlier discussion on the dilemma between efficiency and consumer welfare. The dilemma here is therefore whether online platforms should deal with anonymity in a way which drives up their economic efficiency, or whether focus should be on non-economic values such as distributional justice, liberty or actual consumer welfare. Increasingly, social media platforms are recognising the adverse implications anonymity on their platforms can have on society, even when it does not necessarily affect efficiency. For instance, faced with public backlash from the rise of fake news, more internet platforms now incorporate multiple-factor authentication (MFA) systems into their platforms,[184] notably demonstrating that anonymity is a design choice.

The value of anonymity in the context of internet usage must, therefore, be assessed by reference to its ultimate purpose and social benefits, rather than solely on some obscure technical need or standard. Whether or not anonymity inbuilt into an internet protocol should be preserved or curtailed must invariably depend on the purposes of such an internet protocol and how it is being used. The overriding social benefit of an internet protocol should be the primary consideration in determining how to deal with anonymity. Therefore, to resolve a question of whether anonymity is relevant to cryptocurrencies payments, we must assess its benefits *vis-à-vis* potential threats or social cost.

Admittedly, as already demonstrated above, depicting anonymity only within the context of internet usage is narrow and does little to situate it within other contexts, particularly finance, payments and monetary order. Assessing the value of anonymity within payments, which is our focus here, might require a slightly different approach from the 'technical' approach used above. We begin our analysis by considering the two types of anonymity discussed by the BIS, i.e. *'counterparty anonymity'* describing instances where payers need not reveal their real identities to payees, albeit third-parties may be supplied

[184] Rosenblatt, S., and Cipriani, J., 'Two-Factor Authentication: What you need to Know (FAQ)' (2015). Available at <https://www.cnet.com/news/two-factor-authentication-what-you-need-to-know-faq/> accessed 23 January 2020

with some payment details. Secondly, '*third-party anonymity'* describing instances where identity is not revealed to any third-party.[185]

The former is often presented as "less problematic" because it becomes useful for concealing identity from a payee to reduce risks of identity theft or more innocuous annoyances like targeted advertising[186] or algorithmic data profiling.[187] In contrast, *third-party anonymity* is only adjudged necessary to avoid instances where "knowledge by a third-party of the payee, amount, and time of payment can reveal a great deal about the payer's whereabouts, associations and lifestyle."[188]

From this approach to anonymity, it can be inferred that the value and relevance of anonymity in a payment instrument would depend on peculiarities and practical implications of any such payment instrument on users. This suggests two points: anonymity is an integral part of payments, and the form of anonymity is dependent on the peculiar characteristics of a payment instrument. Thus, cash and debit cards would be inbuilt with different types of financial anonymity to serve different purposes. As such, an e-money payment instrument in-built with *counterpart anonymity* would impose no general duty on a payer to supply personal information directly to a payee, except through financial intermediary. On the other hand, cash which is in-built with *third-party anonymity* could be preferred by a payer to exclude a financial intermediary from accessing the payers' details or shopping preferences, for instance.

What immediately becomes evident from the above analysis is that choice is essential. The value attached to anonymity invariably follows or is dependent on the practical experiences and expectations of a payment user. The relevance of anonymity must,

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[185] Morten, B., and Garratt, R., 'Central Bank Cryptocurrencies' (2017) *BIS Quarterly Review*. Available at <https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf> Accessed 21 January 2020

[186] McAndrews, J., 'The Case for Cash', (2017), No. 679, Asian Development Bank Institute Working Paper Series. Available at <https://www.adb.org/sites/default/files/publication/231516/adbi-wp679.pdf> accessed 22 January 2020

[187] Jonathan, P., 'Protecting Information Consumers' (2019), Centre for International Governance Innovation. Available at < https://www.cigionline.org/articles/protecting-information-consumers> accessed 1 February 2020

[188] Chaum, D., "Blind Signatures for Untraceable Payments" in Chaum D., Rivest R.L., Sherman A.T. (eds), *Advances in Cryptology* (Springer 1988) 199 - 203

therefore, take into consideration how the payment instrument works and how it impacts on users' sense of safety.

Consider the following two hypothetical scenarios in illustrating this point further. In scenario A, payment parties with little prior knowledge or trust of each other enter into a one-off transaction. To facilitate their payment transaction, parties may prefer a medium of exchange which allows them to outsource trust to a third-party to vouch for each party. In such a transaction, payer's details would need not be supplied directly to payee but may be supplied to the third-party. In such a scenario, *counterparty anonymity* would become essential to guarantee the safety of both parties.

In a second scenario, one party may desire not to reveal payment information about what he is purchasing and, as such, opt for payment instrument which provides complete anonymity. *Third-party anonymity* inbuilt into cash might invariably be preferred. Here it immediately becomes apparent that there is a third factor in the assessment of anonymity – user preference. Underlying the conversation about anonymity is the fact that payment users have always had a range of payment instruments to choose from, depending on their peculiar payment needs.

The preceding discourse begs one question: if payment systems have always preserved the range of payment options from which users can exercise choice, do payment parties have a right to this choice? Undeniably, peculiar payment characteristics and user preferences contribute immensely to how this choice is exercised. Although payment parties have always opted for one medium over others either because of advantages such as giving a clear overview of expenses, acceptability or speed,[189] payment parties seem to have always had options and choice. I would, therefore, argue that the relevance or value of anonymity must be laced with user preferences or choice. Consequently, removing anonymity from cryptocurrencies should be assessed from the viewpoint of whether payment users have other options which offer the same advantages as does

[189] Hernández, L., et. al., 'Cash versus Debit Card: The Role of Budget Control' (2017) 51, *J. Consum. Aff.*, pp. 91,112.

cryptocurrencies. This will require an assessment of how anonymity is particularly beneficial in cryptocurrencies payments

But what if choice leads to criminality? Undeniably, the anonymity of cryptocurrencies is often linked with criminal behaviour because it creates invisibility which protects criminals from being traced. However, there are other legitimate reasons why a payment user may want to conceal personal details. For instance, in circumstances where a payment processor can amass and sell on a significant amount of personal information to unauthorised entities like advertising companies,[190] it may be the case that anonymity constitutes an excellent reason to choose an anonymised payment instrument. In a 2017 ECB survey, it was found that over 13% of respondents chose cash for household purchases because of its anonymity.[191]

6.2.1.2 Why Anonymity, Why Not?

The critical question to address now is whether or not the anonymity in-built into cryptocurrencies should be preserved or curtailed. There are two broad perspectives in this regard. First, one school of thought advocates for the curtailment of anonymity for 'national security' purposes by strengthening legal, technical and regulatory requirements for collecting personal information to make it feasible to identify parties behind cryptocurrencies payments.[192] Curtailing anonymity would protect public safety, enable governments to more effectively meet their national security obligations through surveillance, and remove the social costs of cryptocurrencies anonymity, i.e. internet crimes and illicit financial activity.[193]

Advocating the removal of anonymity on national security grounds by creating a legal obligation for payment parties to be identified are not necessarily new or peculiar only to

[190] Boyar, J., and Chaum, D., *et al*., 'Convertible Undeniable Signatures' (1990) 19, *DAIMI Report Series*
[191] Essenlink, H., and Hernández, L., 'The Use of Cash by Households in the Euro Area' (2017), No. 201, *Occasional Paper Series*. Available at https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op201.en.pdf accessed 23 January 2020
[192] Houben, R., 'Bitcoin: There Are Two Sides To Every Coin' (2015) 26(5), *International Company and Commercial Law Review*, pp. 155, 158
[193] Twomey, P., 'Halting a Shift in the Paradigm: The need for Bitcoin Regulation' (2013), Vol 16, *Trinity C.L. Rev*., pp. 67, 70

the cryptocurrencies discourse. These ideas originate from arguments underpinning the 'Know Your Customer' (KYC) requirements typically applicable within traditional banking and finance. By proposing governance frameworks which require cryptocurrencies payment details be de-anonymized, proponents contend that cryptocurrencies will, as a result, become safer, achieve public appeal and become comparatively as efficient as state-issued currency.[194] But the specifics of how this will be achieved remain uncertain, principally because cryptocurrencies do not work in the same way as traditional currencies.

It is also unclear how feasible it will be to curtail anonymity in cryptocurrencies using legal instrumentality, given the cross-border nature of the technology. Also, given that cryptocurrencies are operationally different from traditional fiat money, will it be practically possible to control anonymity simply by imposing rules on third-parties who, at best, play a very minimal role in what is a peer-to-peer network? What implications would imposing such laws have on this nascent technology, especially concerning achieving mass appeal or its continuous evolution?

In other words, it will have to be decided who should be legally mandated to collect users' personal information. Will it be wallet service providers or exchanges who are required to collect information? Alternatively, will it be designers of cryptocurrencies protocols who are required to incorporate information requirements into cryptocurrencies software codes? A third option will be to require payment parties to directly bear any burden of a technical, legal or regulatory duty to supply information. Who will be the target of this governance model, and why? Each of these alternatives will require a different set of considerations. For instance, being customers, will it be justifiable to place the legal burden on payment parties to supply information? If so, there will be insurmountable obstacles concerning how compliance will be monitored. In relation to exchanges and wallets, a few problems immediately become apparent. Given that direct P2P cryptocurrencies payments are still possible without the intervention of digital wallets or exchanges, only a small number of cryptocurrencies payments can fall within the scope

[194] Engle, E., 'Is Bitcoin Rat Poison? Cryptocurrency, Crime and Counterfeiting (CCC)' (2016) 16, *Journal of High Technology Law*, pp. 340 343

of information requirements. Requiring software coders to build information requirements into cryptocurrencies protocols is also extremely unlikely. Problems of enforcement and jurisdictional conflict of laws will militate against such a requirement.

The second school of thought, held by crypto-anarchists[195] who take a somewhat historical and libertarian approach, perceive anonymity as a tool for protecting individual liberties, propriety information and privacy from escalating instances of government surveillance and algorithmic profit-chasing data harvesting by businesses.[196] So long as political repression remains a central feature of many world governments, the right to anonymous use of technology must be preserved and protected, it is argued.[197] Proponents of this view bring a historical account of privacy infractions into debates on cryptocurrency governance by highlighting that the underlying problems sought to be resolved through anonymity are not novel.

The origins of anonymity are traced to cryptography – the ancient craft of secret writing and reading – which explores ways in which communications have been encoded to prevent disclosure through interception or eavesdropping.[198] By tracing cryptography to ancient Egypt, *Khan* demonstrates how, initially, cryptography was exclusively used by national governments in pursuing national security goals, either by protecting national secrets and accessing personal secrets of citizens to ensure public safety.[199] However, it is the advances in computer technology which have exponentially enhanced the appetite and capability of government and business interests to subject citizens to continued "invisible surveillance" either for national security or profit maximisation.[200]

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[195] A form of anarchism (radical scepticism about structures of domination, authority and hierarchy throughout human life) accomplished through the internet. Tim May, one of the first cypherpunks introduced its basic principles in his 'Crypto Anarchist Manifesto' to defend against surveillance of computer communication, promote freedom.

[196] Stender, T., 'Too Many Secrets: Challenges to the Control of Strong crypto and the National Security Perspective' (1998) 30, *Case West. R. J. Int'l. L.*, pp. 287, 288

[197] Lessig, L., *Code: Version 2*.0 (Basic Books 2006) 35

[198] Stender, T., 'Too Many Secrets: Challenges to the Control of Strong crypto and the National Security Perspective' (1998) Vol. 30, *Case West. R. J. Int'l. L.*, pp. 287, 288

[199] Khan, D., *The Codebreakers. The Story of Secret Writing*, (7th Printing, Macmillan 1972)

[200] Dam, K., and Lin, H., *Cryptography's Role in Securing the Information Society* (Net Library, Inc 1999)

But surely, information gathering by governments and businesses can be both beneficial and detrimental, depending on usage. For crypto-anarchists, the detriments seem to outweigh any perceived benefits. For instance, it is argued the implication of information harvesting is two-fold.[201] First, it constitutes an infringement of personal liberties to use surveillance for collecting, processing and sharing citizens' data and then using this data to "sort" citizens into social, political or economic value, or threat. Secondly, continued surveillance would have adverse implications on behaviour and undermine the integrity of free and unhindered public interaction.[202] These ideas will be explored in more detail below but suffice it to say, in the context of digital or online payments, it is argued that anonymity of cryptocurrencies payments ought to be protected from overbearing surveillance by governments and businesses.

The treatment of anonymity from both schools of thought does seem at odds and opposed to each other: a right to anonymous cryptocurrencies to protect propriety interests in personal information versus the governmental duty to protect public interests. The dilemma posed here, especially in relation to the anonymity of cryptocurrencies payments, is whether it is viable to discuss both realms of interests – private liberties and public interests – as distinct and incompatible? or whether both interests collide in a manner which makes it possible to preserve personal liberties while also protecting more extensive public interests? Public interests here, including the aversion of systemic risks,[203] the protection of systematically important financial institutions and the maximisation of efficiency.[204]

The dominant approach by most commentators has been to view both interests as distinct. This often leads to one of two recommendations: either total removal of anonymity for public interest purposes or preservation of anonymity to preserve personal proprietary interests in information against abuses. However, I argue here that a different approach

[201] Gandy, O., *The Panoptic Sort: A Political Economy of Personal Information. Critical Studies in Communication and in the Cultural Industries*, (Westview Press, Inc 1993)
[202] *Ibid.*
[203] Fanto, J., 'Financing Regulation Reform: Maintaining the Status Quo'(2010) 35, *Brook. J. Int'l L.*, pp. 635
[204] Degbhan, F., and Haghighi, A., 'E-money Regulation for Consumer Protection' (2015) 57(6), *Int. J. L. M.*, pp. 610-620

can and should be taken: one which sees both interests, for the most part, as colliding in such a way that protection of personal liberties can be perceived as being in the 'public interest' alongside other concerns which typically fit into a 'national security' rubric. But to fashion a governance model which addresses anonymity following this perception of colliding interests, such model must reconcile any competing interests and resolve extremes without overly compromising one interest.

This approach is underpinned by the idea that, although there are issues which come into tension, both interests are not necessarily at odds.[205] Instead, it is the invectiveness which usually surround debates of *national security* versus *personal liberties* which tarnish efforts to find the right balance. The contention here is that there is necessarily a 'middle road' with opportunities to consider the protection of individual liberties as an aspect of preserving wider public safety. I, therefore, argue that failure to find this balance, especially in the context of cryptocurrencies payments, would push law-abiding citizens into more obscure corners of the internets. To find the right balance, it will be necessary to critically evaluate the benefits and costs of each approach, i.e. national security on one hand and personal liberty on the other.

A. Anonymity: Questions of Personal liberty, Privacy and Proprietary Interests.

While there is consensus on the social benefit of surveillance in preventing anti-social or criminal behaviour, proponents of 'de-anonymisation' contend that national security considerations outweigh benefits of anonymity. In contrast, proponents of cryptocurrencies payments argue that the social costs of ramping up surveillance on citizens are exceptionally high as it violates citizens' privacy rights. To appreciate and assess claims regarding the superior benefits of anonymity, it will be necessary to ask some preliminary questions, i.e. what the value of privacy is in the context of payments? Should privacy be recognised as a right? If formally known as a right, should it be a fundamental right? And how should privacy be balanced against national security concerns?

[205] Stender, T., 'Too Many Secrets: Challenges To The Control Of Strong Crypto And The National Security Perspective' (1998) 30, *Case West. R. J. Int'l. L.*, pp. 287, 290

The value of privacy is particularly difficult to ascertain, particularly concerning the construction of regulation.[206] *Gandy,* in his work on "panoptic sorting", points out that the importance of anonymity and privacy is best appreciated when discussed in the context surveillance.[207] It is the rising costs of surveillance on the populace, either by governments or businesses, which impute value on privacy and anonymity. One of such costs, the knowledge of continued surveillance, is said to have severe implications for behavioural manipulation in the sense that people are likely to self-censor conducts which merely appear controversial, unpopular or questionable, albeit not illegal. This consequently makes individuals constrain themselves, and for those who benefit from surveillance to reduce personhood to mere "profiles" thereby undermining the integrity of public interactions.[208]

Whatever view one may take concerning the value of anonymity and privacy, surveys have shown a growing public dissatisfaction with the state of protections against surveillance or data harvesting. For instance, the European Commission concluded in response to a survey that 'although the majority of Europeans have accepted the disclosure of personal information as a fact of modern life, they appear quite concerned about their privacy.'[209] Crypto anarchists would, therefore, take the view that anonymity ought to be preserved and, perhaps, constitutionally protected because it ultimately preserves personhood, liberties and the integrity of public interactions. Accordingly, promoting or protecting the anonymity of cryptocurrencies payments for online payments in these modern times does more in achieving public safety than strong controls on anonymity.

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[206] Edwards, L., "Privacy and Data Protection: What is Privacy? Human Right, National Law, Global Problem?" in Edwards, L., (ed), *Law Policy and the Internet,* (Hart Publishing 2019) 51

[207] Originating from works of Jeremy Bentham and Michel Foucault on "panopticon" describing the power dynamics between prison inmates and guards, Oscar Gandy developed the concept of "panoptic sort" to describe how people subjected to continuous surveillance by unseen actors might internalize constraints and behave accordingly. See Oscar Gandy, *The Panoptic Sort: A Political Economy of Personal Information. Critical Studies in Communication and in the Cultural Industries*, (Westview Press, Inc 1993)

[208] Farmer, J., 'The Spector of Crypto-Anarchy: Regulating Anonymity-Protecting Peer-to-Peer Networks' (2003) 72, *Fordham Law Review*, pp. 725, 730

[209] COM (2010) 609 final (n.39) Available at < https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0609:FIN:EN:PDF> accessed 23 January 2020

Although I entirely agree that general surveillance can adversely impact behaviour by increasing self-censorship and leading people to refrain from modes of online expression, which are merely questionable or controversial but not illegal. It is, however, problematic to justify the nexus between personal liberties or proprietary interests to public duties of monetary policymakers, particularly in being able to collect relevant data for macro and microeconomic management. If anonymity is presented solely as a solution to surveillance, it becomes problematic to adequately assess its importance in instances where data collection serves other purposes beyond surveillance. This is particularly the case in relation to a policy where, for example, macro-economic policymakers require information about digital products and services to measure genuine levels of macroaggregates.[210] Also, collecting private payment information aids in identifying payment parties, resolving payment disputes and enforcing the outcome of legal such conflicts. Personal data in the context of payment is therefore significant to protecting consumers of cryptocurrencies products from fraud or payment manipulations by merchants. But more broadly, information collection is crucial to maintaining the overall integrity of payments both for public and personal benefits.

On the claim that continuous anonymity has adverse implications on behaviour, it is contended by proponents that anonymity of cryptocurrencies payments serves as an alternative to traditional online payments and as a shield to surveillance within conventional finance. But this contention is somewhat flawed because, in reality, cryptocurrencies payments are exceptionally closed networks which hardly interact with conventional payment systems. Convertibility from crypto to cash is still far too unsatisfactory, and it is almost impossible to find traditional payment institutions with a dual capacity to deal in cryptocurrenciess and traditional currencies. This reality makes this perception of anonymity as being a shield to surveillance within traditional payments somewhat unpersuasive. As a tool for resisting surveillance, cryptocurrencies payment networks only protect anonymity as long as participants remain within the network's confines. Inevitably, participants who seek to preserve their anonymity will immediately

[210] Smets, J., "New Data for Monetary Policy" (2018) Speech delivered at the 9th European Central Bank Conference. Available at <https://www.bis.org/review/r180807a.pdf> accessed 21 January 2020

expose their legal identities as soon as they step outside the confines of cryptocurrencies payments into traditional payment ecosystems.

The consequence is, therefore, that though cryptocurrencies payments resist surveillance, they only do so by retreating from traditional payment ecosystems. Resistance ends up becoming somewhat limited, and although cryptocurrencies payments may offer freedom from surveillance and guarantee privacy, by being 'closed' and exclusive, it invariably takes away the choice for merchants wishing to use multiple payments to complete transactions. That said, it is worth noting that there is yet no proof that removing anonymity would open up these 'closed' networks. I suggest here that it will be a more compelling argument to present cryptocurrencies payments in terms of the payment choice it affords to users. Just as payment users can choose between anonymous cash or less anonymous e-money, cryptocurrencies payments offer an anonymous option for those seeking to discharge online payment obligation. We will further explore this thought in a subsequent section.

B. Removing Anonymity to Protect Public Safety and National Security

As already highlighted above, in an age of the internet and electronic commerce, encryption makes it more difficult for those saddled with protecting public safety or security to observe the content of some internet communications easily. In relation to cryptocurrencies payments, this means that those charged with monitoring the circulation of 'money' within the economy cannot know the identities of parties involved.[211]

This section explores whether controls over crypto-anonymity to protect public safety offers benefits which outweigh claimed benefits of anonymity. In making this assessment between public safety and private liberties, it will be useful to explore how practicability legal instruments have achieved de-anonymisation in cryptocurrencies payments and the extent to which these measures have resolved other more problematic features of cryptocurrencies like price volatility, consumer protection and liability for loss.

[211] Stieglitz, E., 'Anonymity On The Internet: How Does It Work, Who Needs It, And What Are Its Policy Implications' (2007) 24, *Cardozo Arts & Ent. L.J*, pp. 1395,

Let us first tackle the problem of criminality. It is often argued that anonymity makes it difficult for law enforcement to prevent or effectively investigate and prosecute offenders for crypto-related crimes, particularly money laundering, tax evasion and other cybercrimes. While the challenges faced by law enforcement officers are well documented, a report of by the FBI found that these challenges more arise in countries with weak or non-existent rules criminal rules.[212] However, in many developed states, including the United States and the United Kingdom, there have been successfully prosecuted cases involving cryptocurrencies-related crimes. The point made here is that although cryptocurrencies may provide privacy protections, its transactions leave footprints and generate useful data which investigators often successfully trace. Also, it appears investigators are still able to use standard cyber investigative techniques usable to investigate typical criminal cases, such as imaging a victim's computer system, obtaining the internet service provider's logs, or acquiring a victim's public crypto key to determine the address to which the cryptocurrencies was sent have proven quite useful to law enforcement.[213]

In relation to criminal law in the UK, the Proceeds of Crimes Act 2002 makes provision for offences of money laundering and particularly empowers the courts to restrict access to financial proceeds of such crimes and confiscate property. In s. 84 (1), the Act defines property as including "money; all forms of real or personal property; and things in action and other intangible or incorporeal property." S. 41(7) further provides that "the court may make such order as it believes appropriate for ensuring that the restraint order is effective." The implication of these provisions is, therefore, that a court may empower law enforcement to effect the seizure of cryptocurrencies if they constitute proceeds of a crime.

The question of whether the above provisions should apply to cryptocurrencies came up in *R. v Teresko.*[214] The defendant was charged and convicted of drug and money

[212] Nigh, B., and Alden Pelker, Virtual Currency: Investigative Challenges and Opportunities (2017) U.S. Bureau of Investigation. Available at <https://leb.fbi.gov/articles/featured-articles/virtual-currency-investigative-challenges-and-opportunities> accessed 21 January 2020

[213]Bret Nigh and Pelker, A., Virtual Currency: Investigative Challenges and Opportunities, (2017) U.S. Bureau of Investigation. Available at <https://leb.fbi.gov/articles/featured-articles/virtual-currency-investigative-challenges-and-opportunities> accessed 21 January 2020

[214] [2018] Crim. L.R. 81

laundering offences. The prosecutors thereafter made an application under the Proceeds of Crimes Act an order over the defendant's assets. The defendant had in his possession Bitcoins worth £975,000 for which the courts made a confiscation order.

The above discussion demonstrates that although cryptocurrencies are anonymous, *per se*, they are not necessarily untraceable. Law enforcement can always trace and locate cryptocurrencies payments, particularly those associated with criminal activity. However, traceability throws up the problem. When cryptocurrencies are traced, as was the case in *R v. Teresko*, how feasible will it be for law enforcement to identify the specific cryptocurrencies belonging to or held by a suspect? Identification will only be possible if something obvious is found during a search which links a person of interest to the crypto or if investigators trace fiat currency into cryptocurrencies through a crypto-exchange. Of course, this will involve identifying transfers to the exchanges through banking transfer evidence. It is worth mentioning that this problem is not on which exclusively cryptocurrencies payments. The challenge of identifying ownership also occurs with cash or other forms of physical assets. It, therefore, means that the problem policymakers have with cryptocurrencies payments is not necessarily its anonymity. For if anonymity were the prime problem, specific rules curtailing anonymity in cash would already have been enacted.

Furthermore, suggesting that the ability for law enforcement to conduct "checks" into personal identities of cryptocurrencies holders would reduce costs involved in tracing cryptocurrencies payments is illogical and problematic.[215] It requires answers to the questions of how to utilise such checks. For instance, will such checks be targeted at cryptocurrencies holders, crypto-exchanges or wallet-providers? How are checks to be conducted and compliance monitored? And will law enforcement agents have the requisite capacity or systems to perform the checks?

These questions are essential because they mainly underscore how removing anonymity can be achieved in practice. It is noteworthy to state that, in reality, it will be near

[215] Badmus, G., 'A Global Guide to Crypto Exchange Regulatory Framework' (2019) 90, *Journal of Law, Policy and Globalization*, pp. 9, 11

impossible to perform checks or directly request personal information from cryptocurrencies holders. The only possible and practical way of actualising checks will be through crypto-exchanges and wallet service providers. But this approach will encounter two challenges: first, the decentralised and global nature of cryptocurrencies make it challenging to enforce global compliance unless an international consensus is achieved in this regard. Secondly, the scope of applicability of such rules would be limited, given that only a fraction of users transacts with cryptocurrencies through crypto-exchanges or wallet. A majority of users transact cryptocurrencies directly and hold their assets in computer hard-drives rather than with wallet service providers.

There is also a further conversation about how useful data collection would be in addressing other cryptocurrencies issues. I argued here that although continuous surveillance is helpful, it does little to avert or mitigate against the commission of illegal online activities. Instead, despite overwhelming government and private-sector driven attempts at information harvesting, people always tend to find technological tools which help them evade surveillance. Interestingly, as *Stieglitz* points out in his comparative analysis of internet behaviour, Chinese internet users, being well aware of the extreme levels of censorship and surveillance, often utilize anonymising technology to bypass government controls. Contrast this with American users who, "incorrectly" believing that the internet confers some anonymity, make comparatively less use for anonymising tools.[216] The point, therefore, is that, as in China, awareness of continuous surveillance has had the unintended consequence of pushing internet users into more 'unregulated' and 'darker' parts of the internet. Surveillance can, therefore, lead to an increase in criminal activity on the internet.

6.2.1.3 Unresolved problems of speed, Inclusion and cashless policy

Manifestly, anonymity has significant implications both for public order and personal liberties. In the context of payments, anonymity makes it difficult for public authorities to sufficiently tax cryptocurrencies payments or monitor money laundering and

[216] Stieglitz, E., 'Anonymity on the Internet: How Does it Work, Who needs it, and What are its Policy Implications' (2007) 24, *Cardozo Arts & Ent. L..J,* pp. 1395,

corruption.[217] Furthermore, anonymity does not particularly aid law enforcement agencies to more effectively and timeously detect, investigate and prosecute criminals who use cryptocurrencies to perpetrate cybercrimes like extortion, blackmail and fraud.[218] But, anonymity is also important because it affords individuals protections against privacy breaches which see citizens being tracked, profiled and targeted through their online and offline activities by governments and businesses.

Resolving the tension between privacy and national security is particularly problematic because, at its core, it is underpinned by how information should be managed during high-speed computing. I argue here that the transformations in payments occasioned by cryptocurrencies are more accurately linked to the speed and efficiency of data processing rather than its anonymity. After all, cash is a more anonymous form of P2P payments. Instead, the main challenge for existing regulatory approaches is the fact that cryptocurrencies payments can be processed quicker on its decentralised network than is currently possible. The high-speed nature of cryptocurrencies payments makes it comparatively impossible for current regulatory approach of slowing down or stopping payments. Since cryptocurrencies payments can be processed more quickly, proposals to remove anonymity will only marginally address this problem of speed.

The speed discussed here concerns processing power and connectivity. Although removing anonymity might succeed in slowing down cryptocurrencies payments, compartmentalising payments data and allowing the continued reliance on regulatory tools designed for human timescales, such an approach runs the risk of undermining what makes cryptocurrencies payments valuable in the first place. It is also unsustainable.

Another problem with removing anonymity is one which revolves around liberties and choice. Essentially, an answer to whether payment parties have a right to choose anonymous payments? The rise of e-money and move towards cashless society create

[217] Gamble, C., 'The Legality and Regulatory Challenges of Decentralised Crypto-Currency: A Western Perspective' (2017) 20, *Int'l. Trade & Bus. L. Rev,* pp. 346,361

[218] Corcoran, K., 'Law Enforcement Has a Massive Problem with These 3 Cryptocurrencies' (2018). Available at <https://www.businessinsider.com/law-enforcement-problems-with-monero-zcash-dash-cryptocurrencies-2018-2?r=US&IR=T> accessed 23 January 2020.

some problems which make the protection of anonymity essential. First, the cashless policy discourages the use of cash for daily payment tasks. It removes cash's unique features, i.e. it is inexpensive to use and can be exchanged directly without any need for intermediaries. Through these features, cash guarantees that underbanked and unbanked members of society who do not typically have access to the banking system can have access to payments. However, as countries gravitate towards 'cashlessness' and encourage the use of more traditional digital or electronic money instruments, there will be less P2P options available.

If or when cash is gone, those who ordinarily have the choice of P2P payments will need an option which provides some measure of anonymity and privacy. With its decentralised nature, cryptocurrencies combines the physical cash with digital payments and enables P2P payment transactions which cannot be censored.

Also, a move away from cash will leave the economy vulnerable to the omnipresence of government or central control. Every payment will become intermediated, making it impossible to discharge payment obligations without there being a record of such payment. It will eliminate rights to personal liberties, particularly rights to free speech. Although I agree that statistical data is essential for organising monetary policy, it is essential to note that statistical data on cryptocurrencies payments are open and accessible on the internet. The integrity of statistical data on the quantum of cryptocurrencies transactions will not be compromised if such information does not include personal details of payment parties. In any case, removing anonymity will not solve problems of criminality.

6.2.2 Corporate-Focused Intervention Approach

Given the limitations of first-generation cryptocurrencies like Bitcoin and Ethereum, particularly problems of price volatility occasioned by speculative market activities, a new class of cryptocurrencies have been evolving. This new class, popularly known as 'stable-coins' are being driven by private corporations. Three main categories of stable-coins have

emerged in the crypto market, each with slightly distinct characteristics.[219] Despite the characteristic differences, most if not all stable-coins seek to address the foundational problems of first-generation cryptocurrencies. Most notably, stable-coins provide solutions which, in principle, address issues of transactional fees, processing speed, smart contract compatibility, price volatility and market manipulability. In terms of governance, stable-coins constitute a direct intervention by corporate-focused entities most seeking to leverage innovative solutions for pecuniary benefits. Corporate-focused intervention is thus 'self-regulation' modelled on a 'bottom-up' approach to crypto-governance.[220]

The analysis of this model will explore two issues. Firstly, concerns of the regulatory legitimacy and public accountability of corporate-focused approach to crypto-governance. Secondly, it will be essential to examine the specific legal challenges posed by this approach and their potential implications on consumers, technological innovation and the existing financial system.

As indicated earlier, there are different 'stable coins' currently circulating in the cryptocurrencies ecosystem, most of which are designed to minimise the price volatility of cryptocurrencies. Unlike first-generation cryptocurrencies, the value of stable-coins is pegged to more stable private or public assets like gold, the U.S dollar or other digital assets.[221] Stable-coins are characteristically similar to first-generation cryptocurrencies, most are decentralised, operate on distributed ledger technology and are useful for making P2P payments online.[222] Principally, stablecoins promises to repair the falling reputation of cryptocurrencies payment technology as inconvenient means of payment.[223] However,

[219] These categories use different models to stabilise valuation of their respective cryptocurrencies. See: Marco Dell'Erba, M., 'Stablecoins in Cryptoeconomics from Initial Coin Offerings to Central Bank Digital Currencies' (2019) 22 *NYU J. Legis. & Pub. Pol'y.*, pp. 1,10

[220] Herian, R., *Regulating Blockchain: Critical Perspectives in Law and Technology,* (Routledge 2019) 2

[221] G7 Working Group on Stablecoins: Investigating the impact of global stablecoins (2019) CPMI available on <https://www.bis.org/cpmi/publ/d187.pdf> accessed 21 January 2020

[222] Lazcano, I., 'A New Approach for "Cryptocurrencies" Regulation' (2019) 35(1), *Banking Law Review*, pp. 37

[223] Lee, S., 'Explaining Stable Coins, The Holy Grail of Cryptocurrency' (2018). Available at <https://www.forbes.com/sites/shermanlee/2018/03/12/explaining-stable-coins-the-holy-grail-of-crytpocurrency/#1aab87054fc6> accessed 21 January 2020

stable-coins present some challenges, particularly in relation to public policy, oversight and personal liberties.[224]

Stable-coins provide a complex ecosystem of cryptocurrencies payments, and to provide scope for thorough analysis and critique of its corporate-focused approach to crypto-governance, this chapter turns its attention to one stable-coin: Facebook's proposed Libra currency. The Libra currency is a popular idea, and its proposals provide an avenue for critical analysis of self-regulation as a form of crypto-governance. It will be essential, though, to first outline its key proposals, explain how it differs from other more traditional cryptocurrenciess, and critically analyse its benefits and trade-offs if any.

6.2.2.1 Libra: New Global Currency with Stable-Coins?

Facebook's Libra currency is designed to become a "new global currency" to complement existing fiat currencies. In its White Paper, Libra promises to create a "reliable digital currency and infrastructure that can deliver on the promise of the internet of money."[225] It is built around three main characteristics: (a) a secure, scalable and reliable blockchain, (b) backed by a reserve of assets designed to have intrinsic value; and (c) internally governed by the 'independent' Libra Association tasked with evolving the ecosystem.

Libra primarily aims at solving the cross-border problem of payments by using Facebook's extensive global reach to make moving money "as easy and even safer and secure than sending a text message or sharing a photo."[226] Furthermore, Libra proposes to payments validation and processing system built on a decentralised, programmable database designed to support low-volatility crypto – the *Libra Blockchain*. Essentially, this processing system promises to "lower barriers to entry and improve access to financial services" using its open-source protocol.[227]

[224] G7 Working Group on Stablecoins: Investigating the impact of global stablecoins (2019) CPMI available on <https://www.bis.org/cpmi/publ/d187.pdf> accessed 21 January 2020
[225] Libra white Paper available at <https://libra.org/en-US/white-paper/> accessed 21 January 2020
[226] *Ibid.*
[227] The Libra Blockchain, available at <https://developers.libra.org/docs/the-libra-blockchain-paper> accessed 24 January 2020.

Facebook's target is to make Libra universally acceptable and ensure that users are comfortable to use Libra given its market value will, in principle, be stable and less volatile. Unlike first-generation cryptocurrenciess which lack intrinsic value, Libra proposes to be backed by "a basket of bank deposits and short-term government securities held in Libra Reserve for every Libra that is created."[228] The purpose of underpinning Libra with real assets is to gain public trust in its intrinsic value.

In relation to how this currency will be administered and governed, Libra makes an interesting proposition. It is to be administered by an "independent, not-for-profit" organisation – The Libra Association – with a responsibility to provide Libra's governance framework. Although membership in the Libra Association is said to be 'not-for-profit', members include profit-maximising corporate entities like MasterCard, Visa, Uber Technologies, Spotify, Coinbase, Vodafone Group *et cetera.* Membership will be extended to many more companies.

6.2.2.2 Opportunities and Trade-offs?

Despite the immense benefits stable-coins like Libra could have by providing price stability and fostering cross-border payments, financial inclusion and more effective payments, it presents some particularly challenging problems. For instance, if it is to be governed by private profit-driven companies, what implications would Libra have on consumer protection, compliance with tax-evasion or money laundering regimes, and data protection. Also, stable-coins could post broader systemic issues such as implications on financial stability, anti-competition rules and managing integrity of payments. Let us consider a few of these challenges *vis-à-vis* its potential benefits.

Principally, Libra is proposed as a cryptocurrencies whose value will be underpinned by real assets and therefore be stable. The benefits of value stability will be enormous. Prices will not be characterised by the manipulations or speculative bubbles which affect first-generation cryptos.[229] Liquid collateral of high quality such as the US dollar would, in principle, make Libra both stable, liquid and capable of minimising exchange volatility.

[228] Libra white Paper available at <https://libra.org/en-US/white-paper/> accessed 21 January 2020

[229] Tuck, C., and John, F., 'Speculative bubbles in Bitcoin Markets? An Empirical Investigation Into The Fundamental Value of Bitcoins'(2015) 130, *Economic Letters,* pp. 32-36

Unlike traditional cryptocurrencies which incentivises people to hold their cryptocurrencies in expectation of appreciation[230] and creates volatility or reduces public confidence, price stability will make stable-coins a more credible medium of exchange, improve payments, and ultimately lead to widespread adoption of cryptocurrencies payments into mainstream payments.

However, for Libra to achieve wider adoption, it will need to prove it will provide high levels of protection and legal certainty for their users. Also, it will need to ensure that the currency interacts better with fiat currency and the other economy.

However, the fact that Libra's exchange rate is to be pegged with the value of real underlying assets does not, in itself, demonstrate ironclad protection to users from price fluctuations. In practice, underpinning Libra with other assets means that Libra will fluctuate along with the value of its underlying assets. Given that underlying assets, like the US Dollar, are in high demand globally, Libra would not be immune from external events which may impact on the safety or security of such underlying assets. For instance, if a crisis occurs, which affects the value of gold or the US Dollar, it means that the Libra currency would also become as unstable or unsafe. Yes, Libra does offer more stability and price certainty than other cryptocurrencies. Still, Facebook will not have the depths of reserves which national governments hold to cushion against graver systemic shocks. Furthermore, it remains unclear how the Libra Association would respond to sudden crises events. That said, Libra does offer a unique and good solution to challenges of value stability and price volatility.

In relation to public policy, Libra and most other stable-coins introduce a host of other potential challenges. For Libra, Facebook has teamed up with other companies in its Libra Association, some of which already provide payment services. Although the Libra Association will provide governance frameworks and will be "not-for-profit", it is unclear that activities of the Association will not focus on short-term profits. The Libra Association is currently incorporated under the Swiss civil code as a voluntary association,

[230] This trend is known as HODL, an acronym standing for Hold On for Dear Life. It is a slang in cryptocurrencies community referring to the holding of cryptocurrencies rather than selling or using.

or *Verein*, designed as a legal person with a highly flexible governance structure to accommodate a range of "non-economic" interests.[231] However, although *Vereines* are permissible for voluntary and non-economic purposes under the Swiss Civil Code[232], they can also be used for commercial and profit purposes. So, although it is claimed that the Libra Association will be for "non-economic" purposes, there is nothing to stop profit-motivated initiatives.

With the motivations of Libra's sponsors and associates in doubt, it is difficult to imagine how these private companies will be accountable to the public if they opt to cater only to profit-making interests.[233] As a consequence of this private-sector-led governance proposed by Libra, protection of customers' data and funds, as well as the soundness of the financial system could fall outside the main objectives of Libra. It would thus reduce the scope of control which public authorities could have on these private companies who already wield enormous power over consumers' daily lives — power without accountability.

Unlike first-generation cryptocurrenciess, stable-coins and Libra pose significant threats to personal liberties. If not effectively supervised, Libra could become a panoptic instrument for collecting user data. There are no assurances that users' data will be adequately protected against the data harvesting by Libra or its associates. Recent controversies already demonstrate how, for instance, Facebook overlooked regulatory and privacy policies and allegedly granted access or sold off users' personal data to third-party entities for categorising, building tailored political adverts and sharing these with political parties.[234] But more importantly, it will problematic to coordinate Libra's data protection

[231] Katharina Pistor's written Statement before the Committee on Financial Services, U.S. House of Representatives on "Examining Facebook's Proposed Cryptocurrency and its Impact on Consumers, Investors, and the American Financial System" available at <https://financialservices.house.gov/uploadedfiles/hhrg-116-ba00-wstate-pistork-20190717.pdf> accessed 12 February 2020

[232] Part One, Title 2, Chapter 2 of the 210 Swiss Civil Code of 10 December 1907

[233] Noonan, L., and Murphy, H., 'Facebook in Talks With US Regulator Over Digital Currency' (2019) Financial Times. Available at <https://www.ft.com/content/3b2084fe-83c6-11e9-b592-5fe435b57a3b> accessed 21 January 2020

[234] Wong, J., 'The Cambridge Analytica Scandal Changed the World – But it Didn't Change Facebook' *The Guardian* (London, 18 March 2019), available at <ttps://www.theguardian.com/technology/2019/mar/17/the-cambridge-analytica-scandal-changed-the-world-but-it-didnt-change-facebook> accessed 12 February 2020

policies given the different data protection laws which apply across jurisdictions, not to mention the different cultural meanings ascribed to privacy.

Another problem with Libra is its proposal to leave governance to the "independent" Libra Association, i.e. outside the state. It is undeniable that sound and efficient governance promotes the safety and efficiency of payments.[235] By allowing for governance to be determinable only by members of the Libra Association, there are doubts such governance will always reflect public interests, particularly in instances where interests of Facebook or Libra come into conflict. Relying solely on the market forces to drive governance, especially in relation to standards of care, safety or protection, could be disadvantageous.

In response to questions about anonymity, Libra proposes a radical departure from the anonymity inbuilt into first-generation cryptocurrencies. In principle, the Libra Blockchain allows users to hold one or more addresses that are not linked to a real-world identity.[236] However, when responding to questions by the Select Committee on Payments, Facebook recognised the need for identity verification and announced that it would require government-issued identification cards. This means that Facebook and Libra might become a provider of a global digital identity. While the typical problem with requiring government identities in the arena of payments is its elimination of payment choice for those who wish to conduct private payment transactions, the Libra solution is not a solution *per se*. Instead, it simply transfers the obligation for creating or certifying identity from public authorities to private entities. The question here is not whether such digital identities ought not to be created, but whether they should be by governments subject to democratic control, or private actors that can shield themselves from any responsibility.[237]

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[235] G7 Working Group on Stablecoins: Investigating the impact of global stablecoins (2019) CPMI available on <https://www.bis.org/cpmi/publ/d187.pdf> accessed 21 January 2020

[236] Libra white Paper available at <https://libra.org/en-US/white-paper/> accessed 21 January 2020

[237] Katharina Pistor's written Statement before the Committee on Financial Services, U.S. House of Representatives on "Examining Facebook's Proposed Cryptocurrency and its Impact on Consumers, Investors, and the American Financial System". Available at <https://financialservices.house.gov/uploadedfiles/hhrg-116-ba00-wstate-pistork-20190717.pdf> accessed 12 February 2020

6.2.2.3 Conclusion

Libra and other stable-coins undoubtedly provide real solutions to problems of price stability and market certainty. However, they fail to proffer new solutions to anonymity-related issues, particularly concerning personal liberties or as a tool for averting potential illicit criminal activity. In response to issues of a de-anonymised cryptocurrencies system, Libra's solution advances the conversation of whether private entities, most of which are profit-driven, should be trusted with personal identities. I would argue this proposition is far from satisfactory. Admittedly, while governments can potentially abuse their enormous powers in protecting public safety by, for instance, breaching privacy standards, such governments can always be electorally held to account. In contrast, private entities mostly have no obligation or motivation to be transparent, responsible or accountable.

As a form of crypto-governance, Libra currency and other forms of stable-coins do not provide credible solutions to cross-border related problems. As far as they seek to make global payments less cumbersome, the technology does not particularly advance a workable scheme for achieving global harmonised legal frameworks. Following these considerations, I would argue that corporate-focused intervention into crypto-governance remains unsatisfactory. While I agree that private alternatives which provide P2P payments are necessary as society moves away from cash, I am hesitant to find that corporate-focused approach to crypto-governance can provide adequate protection for private liberties and choice. Stable-coins may well pave the way to public adoption of cryptocurrencies payments. Still, they considerably water-down dominant features of cryptocurrencies payments i.e. open-access and decentralised control.

6.2.3 Public-Driven Governance

As earlier discussed, there has always been a historic battle between governments and the private sector on how money is issued and governed. Although private monies won these battles in pre-historic times, governments have however been winning in modern times. By setting rules which determine acceptability of 'money', proscribe counterfeiting and prohibit, in many cases, privately-provided alternatives, governments have deployed their

enormous powers towards protecting their own 'money-creation' franchises.[238] However, the growing popularity of cryptocurrencies, particularly in promising a frictionless, decentralised, censor-resistant, secure and forge-proof alternative has largely served as a threat to the dominance of governments' monetary sovereignty and control over money supply and payments.[239]

From among several potential policy responses, some of which have been discussed in the earlier chapter on Mobilising Payments,[240] there is an emerging call for governments to directly participate, either by digitising its own fiat currencies or by creating their respective national cryptocurrencies to rival, complement or substitute private cryptocurrencies. By directly intervening in this manner, the government might arguably win the race to public adoption of electronic peer-to-peer (P2P) crypto money of any form.[241] A number of central banks have entered the fray, with some actively exploring prospects of central bank digital currencies (CBDC)[242] to address limitations of cryptocurrencies and tackle risks posed, particularly to governments' monopoly over issuing base money, maintaining price stability and the running of the payments system.[243] It is important, though, to make sense of what CBDCs mean, its features and how they could be beneficial over other forms of central bank money and private cryptos.

Although, as acknowledged by the Bank of England,[244] "a monetary regime with CBDC has never existed anywhere because the technology to make it feasible and resilient has until now been unavailable", this section attempts to provide clarity on the stylistic

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[238] England, C., 'Is privately-provided electronic money next?' (2002) 20(1), *Economic Affairs*, pp. 1

[239] Prasad, E., 'Central Banking in a Digital Age: Stock-Taking and Preliminary Thoughts' (2018), *Hutchins Center on Fiscal & Monetary Policy at Brookings*, pp. 14.

[240] In Mobilising Payments chapter, significant work was put into considering some indirect modes of intervening in payments and finance. Without directly entering the fray to participate, governments can ensure order through law and regulation, setting standards and stipulating rules.

[241] Morrison, T., 'The Greenback Needs a Digital Makeover' (2020). Available at https://foreignpolicy.com/2020/01/24/dollar-reserve-currency-united-states-china-crypto-digital-currency/ Accessed 25 January 2020

[242] Some authors phrase this differently. For instance, the *BIS Quarterly Review* (September 2017) phrases this idea as Central Bank Cryptocurrencies (CBCCs). See Morten Bech, 'Central Bank Cryptocurrencies' Available at https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf Accessed 21 January 2020

[243] Barrdear, J., and Kumhof, M., 'The Macroeconomics of Central Bank Issued Digital Currencies' (2016), Bank of England Staff Working Paper No. 605. Available at < https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2016/the-macroeconomics-of-central-bank-issued-digital-currencies>

[244] *Ibid*.

features of CBDCs while also critically examining its economic merits and demerits. But even more importantly, clarity is provided in relation to the legal issues which arise when CBDCs are introduced into domestic payments arena, arguments for and against its issuance, their practical implications on private cryptocurrenciess, and any societal implications to the conduct of monetary policy by central banks and beyond. Such examination aims to demonstrate the legal, practical and technical implications CBDCs would have, particularly on liberties in relation to private cryptocurrenciess. Identifying these implications would significantly aid our assessment of the adequacy of CBDCs as the mode of cryptocurrenciess payment governance. Put differently, will CBDCs more efficiently and successfully address practical, legal and economic issues posed by cryptocurrenciess payments?

6.2.3.1 What Is CBDC?

The starting point in defining CBDCs is to, quite rightly, use a taxonomy often also used in describing other forms of money. For this purpose, we adopt the four-way taxonomy used by the BIS.[245] Issuance, explaining how money is issued, i.e. whether by private entities or by public bodies such as central banks. Representation, identifying the form which such money takes, i.e. whether as a physical token or an electronic/online variant. Transfer mechanism, describing the nature of transfer settlement, i.e. whether payments are settled on a centralised system or decentralised network. And lastly, accessibility, to define levels of access to the money, i.e. is it universally accessible or only accessible to a limited/closed group. Accordingly, CBDCs are proposed as electronic liabilities to be issued by central banks that can be used in peer-to-peer payment exchanges.[246] Another approach, one taken by the BoE, is to perceive CBDCs as central bank-issued (either for universal or limited access) electronic, national-currency-denominated access to its balance sheet.[247]

This taxonomy, though quite simplistic, reflects what appears to be two potentially emerging and distinct types of CBDCs: one issued and made accessible to the general

[245] Morten, B., 'Central Bank Cryptocurrencies', Available at <https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf> Accessed 21 January 2020
[246] Barrdear, J., and Kumhof, M., 'The Macroeconomics of Central Bank Issued Digital Currencies' (2016) *Bank of England Staff Working Paper No. 605*
[247] *Ibid.*

public for retail payments in the same way cash, as central bank liability, is accessible to everyone; and the other being those issued and made available to a limited group such as financial institutions for wholesale payments in the same way 'central bank money' or 'central bank reserves' is wholly only available in order to facilitate payments between commercial banks such as the discharge of inter-bank liabilities. Essentially, CBDCs are presented as electronic money issued by central banks but exchanged using on the central bank's centralised system to facilitate peer-to-peer payments without any need for intermediation.

It is worth noting that as of the time of writing this thesis, no central bank around the world has yet designed a monetary regime where CBDCs are issued alongside other forms of money. As a matter of fact, it is reportedly the case that major central banks are not particularly supportive. For instance, the U.S Federal Reserve absented itself from collaborative meetings initiated by their European and Japanese counterparts to consider CBDCs.[248] There is therefore little material in relation to its actual design or functionality to help evaluate how it would serve to curtail private cryptocurrencies excesses.

This notwithstanding, The BoE has suggested a broad set of ideas regarding how CBDCs might be put into operation.[249] If it goes forward with issuing CBDCs into the UK payments space, only an initial stock equal to 30% of GDP will be issued against an equal amount of government debt. This percentage would, however, be subject to countercyclical variations over the business cycle and maintained at that level. It also suggests, as with other forms of money, that CBDCs would be held in deposit accounts domiciled in commercial banks. But in the case of CBDCs, the BoE takes another additional step: they will also be domiciled in central banks in the same way 'central bank reserves' are. Also noteworthy is that fact that CBDCs could be issued either as a token-

[248] Wilson, T., 'Explainer: Central Bank Digital Currencies – Moving Towards Reality?' (2020), Reuters News. Available at <https://www.reuters.com/article/us-cenbank-digital-currencies-explainer/explainer-central-bank-digital-currencies-moving-towards-reality-idUSKBN1ZM2JH> Accessed 29 January 2020

[249] Barrdear, J., and Kumhof, M., 'The Macroeconomics of Central Bank Issued Digital Currencies' (2016), *Bank of England Staff Working Paper No*. 605

based currency like cash which is physical tokens; or as account-based money such as balances in reserve accounts and most forms of commercial bank money.[250]

The introduction of a CBDCs, whether as a general-purpose or limited wholesale instrument, could have potential benefits and also pose challenges. It will be important to evaluate these benefits, challenges and, importantly, discuss the impact of these hypothetical assessments on privately issued cryptocurrencies. Ultimately, it will have to be shown that CBDCs can serve as efficient governance or regulatory model for cryptocurrencies. But in order to make this assessment, there are some key questions which will need answering: will CBDCs be different from private cryptocurrencies? What are its advantages, if any? And how practical and plausible is it that the BoE will issue CBDCs?

6.2.3.2 Links between CBDCs and Cryptocurrency

Central banks are typically saddled with the responsibility of money issuance. However, evidence in the UK, as with many other nations, suggests that up to 90% of money supply circulating within the economy is privately issued bank liabilities otherwise known as commercial bank money.[251] This means that other forms of money, though not directly issued by central banks, such as bank quasi-money in the form of securities and e-money, can equally be viewed as falling within acceptable forms of institutional money sanctioned by the state.[252] Demonstrably, money takes on a variety of forms, i.e. some publicly issued while others privately issued but under supervision of public authorities.

Central banks often view this dual system as beneficial because competition in the provision of currency enhances innovation and drives efficiency.[253] However, the approach of central banks to cryptocurrencies is completely different. For the most part,

[250] CPMI Report, 2020. Available at <https://www.bis.org/list/cpmi_all/sdt_1/page_4.htm> Accessed 2 February 2020.
[251] Goodheart, C., 'The Two Concepts of Money: Implications for the Analysis of Optimal Currency Areas' (1998) 14(3), *Eur. J. Polit. Econ.*, pp. 418,
[252] Zoltan, P., 'Shadow Banking: The Money View' (2014) Office of Financial Research Working Paper. Available at <https://www.financialresearch.gov/working-papers/files/OFRwp2014-04_Pozsar_ShadowBankingTheMoneyView.pdf> Accessed 24 January 2020
[253] Kokkola, T., *The Payment System: Payments, Securities and Derivatives, and the Role of the Eurosystem* (ECB 2010) pp. 45

central banks do not consider privately issued cryptocurrencies as innovative and capable of improving efficiency. On the question of how to govern the innovative cryptocurrencies payment technology, central banks have displayed a tendency rather recommend its total ban or strict regulatory control to remove aspects of its design. A third approach, contemplating the direct intervention into cryptocurrencies through the issuance of CBDCs, is even more radical because of the apparent threats posed by crypto.

This rather drastic approach being considered by central banks, however, pose some rather interesting questions: for instance, why are CBDCs proposed as a mode of cryptocurrencies control? How useful would such control be in addressing the limitations and opportunities presented by cryptocurrenciess? Although central banks already deal with and issue significant amounts of digital money, I would argue the answers revolve around the fact that there are severe distinctions between private cryptocurrenciess and other electronic forms of money issued by central banks. It is cryptocurrencies' peculiar decentralised transaction handling and access for competitive creation which mark its dissimilarity. But more importantly, unlike institutional electronic forms of money which are issued by or under supervision of central banks, subject to value convertibility tests and fall within the protective scope of deposit insurance, cryptos diametrically differ as its use is not dependent on meeting traditional criteria for money.[254]

6.2.3.3 Arguments For and Against the case for CBDCs

There are hypothetical suggestions CBDCs could provide viable solutions to address some cryptocurrencies payment limitations, particularly in relation to providing a safer central bank instrument which offers more price stability, inflexible supply and convertibility.[255] But also, these CBDCs could well pose some challenges and, in relation to existing private cryptocurrenciess, it is important to understand how CBDCs would compare and what implications they would have on the technology. Let us consider a few of these arguments.

[254] *Ibid.*

[255] Codruta, B., *et. al.,* 'Impending Arrival – A Sequel to the Survey on Central Bank Digital Currency' (January 2020) BIS Paper Available at <https://www.bis.org/publ/bppdf/bispap107.htm > accessed 2 February 2020.

One prominent example of how CBDCs could be beneficial often always pertain to the limited supply of cryptocurrenciess, particularly bitcoin. The argument goes that because cryptocurrenciess are primarily driven by demand and suffers the limitation of capped amount, their inflexibility would offer no protection against systemic risks such as structural deflation. As such, if cryptocurrenciess were to reach widespread adoption, its 'limited supply' feature would reduce the ability of central banks to maintain monetary stability, to respond quickly and flexibly in times of fiscal stress, and to perform its function as a lender of last resort. It is in response to these limitations that a publicly issued CBDC could become beneficial because the limited supply problem of cryptocurrenciess would not characterise it.

But this argument is somewhat flawed. First, cryptocurrenciess only make a small fraction of all the payments within the system. The argument also completely ignores the fact that systemic risks posed within the payments sector are those triggered by activities of commercial banks in their use of credit facilities and money creation activities. On the contrary, cryptocurrenciess completely bypasses intermediation and invariably reduces any risks of financial impropriety and danger which typically characterises traditional financial institutions. It is hard to see how the issuance of public cryptos in the form of CBDCs would address systemic risks in this way. In any case, opening up central bank reserves to crypto would itself pose systemic risks given they could then be subject to the usual manipulations which already characterise modern finance. Also, rather than address the core problems of consumer protection, trust and price stability, centrally issued CBDCs would, in my view, adversely impact on the open access which already exists in the creation or mining of cryptocurrenciess. It would disenfranchise individuals and entities who are already heavily invested in advancing the technology.

It is also argued in support of CBDCs that its introduction would allow for conditions where policymakers could test and implement unconventional monetary policies which may ultimately increase the smooth operation of such techniques.[256] For instance, although many different monetary policy techniques were tested during the global

[256] Gorton, G., and Metrick, A., 'Regulating the Shadow Banking System' (2010) SSRN Electronic Journal. <http://ssrn.com/abstract=1676947> accessed 1 February 2020

financial crisis, a few radical and potentially useful tools were untested. One example[257] is the use of 'helicopter drop of money' proposed by Ben Bernanke[258] as a tool which the US Fed might use in response to the future economic slowdown. Helicopter money is a hypothetical possibility for combating deflation by using a "broad-based tax cut combined with money created by the central bank to finance the cut."[259]

Though some would consider the introduction of CBDCs as useful for testing out radical monetary policies like helicopter money, it is important to note how this sharply contrasts with the underlying ideas behind private cryptocurrenciess. The manipulability of money by governments, either in devaluing national currencies or constantly adjusting valuations against foreign currencies is one reason why cryptocurrenciess were designed: to be driven by demand.

Merely issuing a government-backed cryptocurrencies does little to address problems of governmental abuse and tampering of market economics. Again, this illustrates quite clearly the tensions between government-led control of payments and private choices, particularly in identifying what the proper role of government should be in relation to payments. I would argue that the question here is not whether the economy needs digital fiat currency, but instead whether the government will use CBDCs to retain control and monetary sovereignty over cryptocurrenciess and take steps to safeguard those powers against private entities. The answer is most certainly yes, in which case a more deliberate conversation about government power vis-à-vis surveillance and monetary manipulation should win over personal liberties and unhindered participation in payments without overbearing government or business conditions.

It is argued that by removing intermediation in payments, CBDCs will potentially benefit financial markets by guaranteeing the general public's direct access to risk-free assets and

[257] *Ibid.*
[258] Ben Bernanke is an American economist who served two terms as the Chair of the US Federal Reserves.
[259] Ben Bernanke, 'What Tools Does The Fed Have Left? Part 3: Helicopter Money' (Brookings 2020) <https://www.brookings.edu/blog/ben-bernanke/2016/04/11/what-tools-does-the-fed-have-left-part-3-helicopter-money/> accessed 1 February 2020.

eliminating incentives to run in times of systemic bank crises.[260] In this view, since there will be no banks per se, there will also be no instances where a large number of bank customers withdraw their deposits. This is based on the assumption that CBDCs will be held as deposits at central banks. But this argument is somewhat simplistic or pedestrian at best. First of all, the argument focuses on depositor withdraws as being a major trigger of bank runs. The global financial crisis of 2007, however, demonstrated a completely different reality: deposit insurance schemes effectively prevented depositors from the largescale withdrawal of funds. The bank runs which occurred during that crisis were mostly triggered in the wholesale funding markets, i.e. interbank credit and lending activities. Another way to take the argument would be to, as some suggest, consider CBDCs beneficial because they remove the need for bank deposits, and be an extension for deposit insurance and all the problems associated with it.[261]

This is a more plausible argument, especially when one considers that in most cases deposit insurance only covers a limited amount of deposits. That said, when compared with private cryptocurrenciess, it is unclear how CBDCs would more effectively discourage panic withdrawals, and neither is it clear how CBDCs would work simultaneously with fiat and commercial banks. In any case, there is little strength in this argument, particularly in relation to whether it addresses any particular problematic aspect of cryptocurrenciess. After all, like private cryptocurrenciess, CBDCs will only form a small fraction of the entire systems and be insufficient to trigger a systemic crisis.

As a follow on from the benefit of disintermediating payments, it is argued that one benefit of CBDC is how it could transform the role of commercial banks in credit allocation and problems in administering such credit. One of such problems is when commercial banks cannot meet customers' liquidity needs or when they are unable to honour promises to redeem deposits in cash at par value.[262] Also, there are problems in relation to how credit is allocated and what considerations go into making such decisions. Ultimately,

[260] Raskin, M., and Yermack, D., 'Digital Currencies, Decentralized Ledgers, And The Future Of Central Banking' <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2773973> accessed 2 February 2020.
[261] Demirgüç-Kiunt, A., and Edward, K., 'Deposit Insurance around the Globe: Where Does it Work' (2002) 16(2), *J. Econ. Perspect.*, pp. 175, 195
[262] Pichler, P., Summer, M., and Weber, B., 'Does Digitalization Require Central Bank Digital Currencies for the General Public?' (2020) 4, *Monetary Policy and the Economy*, pp. 4

commercial banks create a significant amount of bad debt by granting credit to vulnerable customers without proper consideration of the possibilities of repayment.[263] These bad debts often have adverse social, environmental and economic consequences like creating periodic booms and busts, inflating housing prices and consequences for growth, unemployment and investments.

The housing bubble and bust, which triggered the financial panic in the US and ultimately led to the 2007/08 financial crisis is a case in point. The point made here, therefore, is that by phasing out commercial banks, particularly their tendencies towards credit, CBDCs would permanently solve the problems of bad debt because, unlike commercial banks, central banks can create money without external hard limits, can operate with negative equity and cannot technically become insolvent. The almost grandeur posture of central banks would be *de facto* protection from insolvency, meaning there would be no limits to their ability to lend CBDCs to the real economy, even during a financial crisis.

There are, however, a few problems with this argument. First, although CBDCs could well address problems of debt overhang created by commercial banks, it may create additional problems in relation to the direct involvement of central banks in credit creation. In addition to its role as a regulator, requiring central banks to directly or indirectly lend funds to private businesses or governments could expose them to significant political risks and lead to suboptimal economic outcomes as well.

Secondly, it is quite problematic to expect central banks to, on the one hand, bear the responsibility of maintaining financial stability while also occupying an active role as a credit making institution, on the other. Of course, it could be argued that CBDCs are not designed for credit granting. The point made here is that CBDCs are currently only an idea which is at the time of writing this thesis yet to be implemented in any country. Given that traditional central bank monies are inextricably linked with credit issuance, it is not implausible to argue that CBDCs could also be extended to credit issuance. In any case, if it were, self-regulation would place central banks in an awkward position, especially in

[263] Sameeksha, B., 'Structural and Control Problems in Credit Administration' (1976) 11(35), *Econ. Polit. Weekly*, pp. 95, 97.

relation to meeting its regulatory objectives and satisfying political motivations for credit. In any case, none of these issues has any direct bearing on the efficacy of payments, particularly retail P2P payments which cryptocurrenciess offers. Essentially, CBDCs would create more problems in relation to credit than it could address issues with cryptocurrenciess payments. In any case, other than its investment features, i.e. initial coin offerings (ICOs) and trading schemes, cryptocurrenciess do not pose any problems in relation to credit. It is unclear how CBDCs in this sense would address weighty issues such as liability for loss, consumer protection or problems associated with anonymity of cryptocurrenciess.

Some argue that the introduction of CBDCs could strengthen retail payments by providing an electronic alternative in instances where the payment infrastructure provided by the private sector is disrupted for any reason. Upon such disruptions, households and businesses would have an alternative and could still make digital payments via CBDCs, especially if cash has largely disappeared or lost value.[264] This argument invariably suggests that CBDCs be treated as a veritable replacement for cash. But in thinking this way, it is important to realise that physical cash has very distinct characteristics as a payment instrument: first, cash is a more inclusive means of payment because it is easy to use and is available to everybody in society. Also, cash is device-independent and crisis-proof in the sense that physical banknotes and coins can continue to be used to make payments even in power shortages or internet outages.[265]

Turning to CBDCs as a replacement for cash is, to some extent, quite inconceivable because the advantages of cash cannot be preserved to the fullest extent by any form of CBDCs. For instance, any incidents which cause disruptions to private and technologically driven payments infrastructure could also invariably affect the electronic and centralised system proposed for CBDCs, whether token or account-based. In times of such lapses, it is the decentralisation, ease of access and decentralised availability of cash which best serve as an alternative. CBDC cannot offer the credible and efficient peer-to-

[264] Jack M., *et. al.*, 'Broadening Narrow Money: Monetary Policy With A Central Bank Digital Currency' [2018] SSRN Electronic Journal

[265] Pichler, P., Summer, M., and Weber, B., 'Does Digitalization Require Central Bank Digital Currencies for the General Public?' (2020) 4, *Monetary Policy and the Economy*.

peer payment which cash does. In any case, cryptocurrenciess offer the closest alternatives to cash because it is equally peer-to-peer and is accessible to anyone, with minor technological constraints.

Another argument in favour of CBDC is that it may facilitate instantaneously and perhaps make payment execution inexpensive.[266] The argument goes that with appropriate interoperability arrangements between central banks, cross-border payments can also be made instant. This would, therefore, overcome the cross-border challenges of cryptocurrencies payments, especially in relation to legal enforceability and conflict of laws. However, it worth noting that there is not much evidence to drive an evaluation on this matter. Suffice it say, though, that issuing CBDC would not be the sole method of achieving instantaneous payments across borders. As identified in our earlier discussion in chapter 5, there already exists a variety of payment systems and agreements which make centralisation of payments and payments settlement. When compared with cryptocurrenciess, it appears an attempt to use CBDC for cross-border payments would attract more fees, especially because it would require mediating through the diverse interests of central banks and their respective monetary policies.

6.2.3.4 Conclusion and Reflections

The surge in privately issued cryptocurrenciess has raised concerns of threats to public interests, especially in relation to implications on monetary systems, national security and illicit financial activity. Also, there is an on-going intellectual onslaught on cash payments and the move towards a cashless society adds another layer of complexity to debates on payments. Quite justifiably, economists and policymakers have been led to investigate the possibility of central bank digital currency, a public electronic alternative to cash, aimed at rivalling privately issued cryptocurrenciess and addressing its issues once and for all.

Despite its many potential economic advantages, it remains somewhat unclear how CBDCs would address specific questions of the censor-resistance and anonymity which cryptocurrenciess promote. I hope it is now clear that anonymity matters and, as has been

[266] Bordo, M., and Levin, A., 'Central Bank Digital Currency and the Future of Monetary Policy' (2017), NBER Working Paper No. 237111

suggested, plays a significant role in increasing overall public appeal towards any medium of payment.[267] Of course, CBDCs would widen the choice of available digital payment instruments to accommodate more features in terms of efficiency, security and perhaps cross-border electronic payments, hence providing an alternative for cryptocurrenciess. However, the existing array of payment options, such as cash, credit and debit cards, e-money, wire transfers *et cetera* already offer a wide range of options. Those who opt for cryptocurrenciess, it appears, are more attracted to its privacy and online security features which remain in short supply in other traditional payment instruments. Unfortunately, CBDCs do not provide robust enough answers in this regard. If anything, CBDCs are just an extension of state centralisation, with no semblance with cryptocurrenciess to justify its description under the rubric of crypto. A more appropriate term for CBDC would be 'centralised digital cash'.

The implication CBDC would have on privacy-conscious users of cash, whether or not they are used for illegal online activities or not, would be to incentivise them to move more towards privacy-enhancing cryptocurrenciess like bitcoin. It is important to note that the popularity of cryptocurrenciess has not entirely been influenced by efficiency considerations, albeit that may form part it. Instead, it is issues pertaining to privacy, censorship, continual surveillance and behavioural manipulation, which has increased the popularity of cryptocurrenciess, particularly bitcoin.

Without addressing the core concerns of privacy and the massive data-harvesting undertaken by governments and businesses, features which cryptocurrenciess happen to offer, CBDCs would further drive users who seek privacy and anonymity further underground. This would further exacerbate illegal activities on the deep web, undermine the technological advancements which DLTs and cryptos could usher while also leading to many more unforeseen consequences. But in addition to questions of privacy, there are other real-time legal questions which cryptocurrenciess payments pose: issues regarding

[267] Borgonovo, E., *et. al.,* 'Cryptocurrencies, Central Bank Digital Cash, Traditional Money: Does Privacy Matter?' (2018) Working Paper No. 95. <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3291269> accessed 21 January 2020

liability for loss, consumer protection, and irreversibility of payments or third-party involvement. CBDCs offer no answers to these.

Admittedly, anarchist and libertarian tendencies of censorship resistance would be less appealing in advanced democracies where governments are more accountable and monetary operations fairer. However, although not within the remit of this work, cryptocurrencies payments could serve an enabling purpose for citizens living in less-democratic societies where censor-resistance payments could empower citizens by protecting liberties and increasing access to global digital money independent of the whims of unaccountable and dangerous political actors. Unfortunately, CBDCs do not present any answers or proposal to these questions. Instead, they could well become a tool for the continued overuse and abuse for political purposes or domestic sanctions against citizens considered as problematic by the state.

6.3 CONCLUSION

This chapter has critically analysed a range of different proposed governance approaches for bringing cryptocurrencies technology within legal control. The chapter recognises, following on from the findings from previous chapters, that the regulation of cryptocurrenciess poses more underlying political concerns regarding whether government control over payments should be ceded and decentralised. On this basis, each proposed governance model makes credible recommendations which address some aspects of the issues in relation to crypto. These approaches have their respective weaknesses and strengths, but, I argue, they provide no comprehensive response to all the issues identified earlier without compromising on the critical aspects of the technology. Some proposals stifle crypto-innovation and cause further problems.

For example, while the fragmented governance approach may be somewhat appropriate in addressing some of the crime-related issues, particularly tax evasion and money laundering, it drastically stifles cryptocurrenciess major feature: the ability to provide anonymised P2P payments online to operate like cash for online payments. Given the gradual emergence of a cashless society, removing crypto-anonymity would, I argue, deprive users who prefer to use cryptocurrencies payments. Denying such users this

choice would disregard a section of the population who may be left behind in a completely cashless society.

Furthermore, removing anonymity, I argue, would remove the privacy protections which it accords to transactions, especially in relation to online payments. All other payment options for completing online transactions are subject to heavy surveillance, both from governments and private businesses. Excessive surveillance of payment habits can lead to panoptic sorting, where individuals personal payment habits are collected, sorted and shared for purposes of targeted advertising or algorithmic behaviour predictions. I quite agree that this would limit or undermine the integrity of public interactions. The recent Facebook and Cambridge Analytica scandal is case in point. Allowing governments or businesses to collect vast amounts of user data expose individuals to extreme infringements of privacy, and potentially, damage society's civic space.

I agree that there is some truth to the idea that anonymity makes it more difficult for law enforcement to trace crypto-transactions. I, however, argue that this is not entirely correct. First, cryptocurrenciess are anonymous only to the extent that personal identities are not attached to exchange transactions. But this does not mean that such transactions are untraceable. I, therefore, argue that with the right tools, law enforcement can effectively trace cryptocurrencies transactions. Additionally, the distributed ledger makes it further easier as it records all transactions on its ledger. De-anonymised cryptocurrencies exchange tokens would look markedly different and remove its innovative feature.

CBDCs are also a unique solution because they will potentially lead to public adoption. However, given that crypto is an alternative to the state-run system, CBDCs are an extension of state centralisation. Granted, they would solve problems of price volatility and widespread adoption, but allowing the government to centralise cryptocurrenciess would entirely defeat the ideas of decentralisation. Corporate-Driven interventions are not without their problems either. Ceding control entirely to profit chasing private companies, I argue, is even more dangerous. Such private solutions are untrustworthy because, like government-issued fiat currencies, stablecoins suggest further centralisation of payments.

It is now apparent that to construct a suitable and appropriate governance framework for cryptocurrencies technology which both protects 'public interests' and 'individual liberties', finding a meaningful counterbalance between core concerns of each group is necessary. Such a governance framework must meet the goals and incorporate the normative principles outlined in Chapter III while also addressing the practical and legal issues discussed in Chapter IV and V, respectively. Ultimately, such a regulatory framework must create incentives for innovation to continue. By enhancing innovations in payments, a suitable governance model will benefit the economy by managing competition, removing threats to public safety and reaping benefits of cryptocurrenciess. But such a governance model must also be designed in such a way not to undermine political sovereignty over monetary operations.

To succeed in re-tooling law, the clashes between public and private interests, on the one hand, and the goals of efficiency and distributional justice will have to be reconciled. New governance approach must invariably sort out the extremes between state and private interests, striking a balance between the need to design regulatory interventions which protect public interests and those which aim to preserve individual preferences. But of equal importance, intervention in cryptocurrencies must also take its implications for social values such as democracy, liberty and civic engagement.

In response, the 'old legal toolbox'[268] of payment rules will require re-tooling, a redefinition of categories and a rethink of regulatory focus. Not only should financial regulation be targeted at maintaining the integrity of existing systems, it must also consider the changing spate of payments, which are itself a reflection of social change. Also, as traditional payment instruments like cash get pushed to the fringes of society by technological innovations, payment regulations must aim to protect those who will be left behind, by opening up spaces for them to participate in payments. We must also reconsider regulatory techniques and their capacity to resolve new problems of speed, algorithms, artificial intelligence and automated decision making.

[268] From conclusions drawn in Chapter V on Mobilising Payments, it is apparent that the existing rules within our legal toolbox have been insufficient in addressing crypto-related challenges. This unsuitability is however not merely due to an absence of specific provisions, but is occasioned by the implicit biases in-built into legal rules, traditions and aims. The laws implicitly protect the interests of those entities who occupy apex positions within the financial hierarchy.

Admittedly, the task of re-thinking law to do no harm and harness benefits of cryptocurrencies payments has so far proven extremely difficult, if not impossible. It is now becoming apparent that there is more to the unfolding story of crypto-governance than debates on the suitability of law would suggest. As indicated above, there are underlying political and ideological tensions regarding who should control payments. Should control go to profit-maximising private, commercial, or corporate entities focused on 'dislodging' incumbent payment systems and institutions? Or should control be ceded to centralised governments who ultimately protect their state-run monetary system and the 'close-circuit' entrepreneurial ecosystem built around it?[269] Constructing an appropriate crypto-governance framework will require critical analysis of how factors of production should be controlled. Conversations on the suitability of legal instruments seem only ancillary at best. This chapter, therefore, provides a critique of proposed or existing approaches to crypto-governance, examining the implications on consumers, innovation, and the payments system. Upon discussing different proposals for cryptocurrencies governance, identifying trade-offs, opportunities and critical implications of each model, this chapter lays the groundwork for a new governance proposal which can build from the weaknesses of existing regulatory proposals.

[269] Herian, R., *Regulating Blockchain*: *Critical Perspectives in Law and Technology*, (Routledge 2019), 3

CHAPTER VII

CONCLUSION AND PROPOSALS

It is worth looking at the bitcoin system in the prism of democracy values: freedom, sovereignty and self-government. It holds freedom value through the decentralisation of a transaction and settlement system that prevents an interference.[1]

7.1 INTRODUCTION

7.1.1 Summary

At its core, this thesis has focused on the emergence of cryptocurrencies as an innovative payment technology. Cryptocurrency differ significantly from other forms of existing money to the extent that they offer an alternative vision of how internet payments should be organised. Specifically, as demonstrated earlier on in the thesis, cryptocurrencies propose a considerable disintermediation of online payments; and by utilising its underlying distributed ledger, it decentralises payments in a manner that takes control away from the state and its franchised private institutions. Furthermore, unlike other forms of online payments, cryptocurrencies are not issued or processed centrally in the same manner as traditional fiat currencies are. Instead, creation of tokens and authentication of payment transactions are open-access for 'miners' on a competitive 'proof-of-work' basis. Furthermore, payment transactions are recorded and processed on digital ledgers that are distributed and freely accessible on the internet. In effect, unlike any other forms of online payments, cryptocurrencies make direct peer-to-peer online payments possible, resolving the 'double-spend' problem and eliminating intermediation by traditional third-party financial institutions.

It is often claimed that proposals and operational realities of this emerging innovative technology presents potential economic and social benefits. For instance, as demonstrated in Chapter III, cryptocurrencies provide an additional layer of security, remove transactional costs and cut transaction times when compared with traditional online

[1] Trzcionka, M., 'The Bitcoin – Democratic Money in a Neoliberal Economy' (2018), Vol. 19, *Journal of American Studies,* pp. 155-173

payments. However, they also present some significant challenges to orthodox conceptual and legal understandings of money and payments. To address these challenges, cryptocurrencies require a robust governance framework that, on one hand, promotes potential benefits of its use; and, on the other, sustainably addresses problems associated with systemic risk and criminality. To this end, this thesis has undertaken a thorough examination of the legal regime for digital payments under English law to ascertain its adequacy to respond to novel issues posed by cryptocurrencies.

Before addressing this question, Chapter II undertook a critical and interdisciplinary analysis of the historical and theoretical underpinnings of money. The chapter traced the theoretical explanations of money from the classical age where gold bullions were used as money to contemporary modern times of digital commercial bank money. This theoretical journey found that in modern financial systems, the conceptual framework of money is not static or fixed. Instead, the concept of money is fluid and has continued to evolve to reflect changing payment practices and realities. For instance, classical economic theories of the 17th century perceived money as tangible commodities with its intrinsic value determined either by corresponding market value of certain metals like gold, or by market consensus. Neoclassical economic thinking, which emerged in the 19th century, contrastingly perceived money in terms of its functions i.e., money as anything that performs as a medium of exchange, a store of value and a unit of account. In this context, the chapter concluded that cryptocurrency is not necessarily a revolutionary event but rather, it is a continuation in the un-ending evolution of money.

In relation to legal understanding, Chapter II also critically analysed the interactions between law, the state and the nature money. Discussions examined the state theory of money and the evolving role of law in ascertaining the nature of money. This examination concluded that law plays a vital role in lending authority to emerging public and private money, but law alone does not dictate how people chose to exchange value for goods and services. The analysis also revealed that money operates within a structured hierarchy in which the public adoption of any particular money is an outcome of the complex interaction between state and non-state actors, itself a demonstration of position and influence within the structured hierarchy of money. Within this context, governments

possess excess powers to utilise the range of legal and regulatory tools at their disposal to franchise any payment instrument as acceptable.2

The implication is therefore that the absence of legal recognition accorded to an emerging financial instrument does not of itself disqualify such instruments from being used for payments. Instead, every payment instrument that performs the tripartite functions of medium of exchange, store of value and unit of account invariably qualifies as money but will eventually require legal vindication in order to ascend the money hierarchy and potentially attain widespread acceptance. As such, for cryptocurrency to achieve widespread acceptance, it must be shown to function as money and receive legal or regulatory validation.

Chapter II ultimately concluded that modern payments system is hierarchically ordered and invariably produces a hierarchy of money that comprises different forms of money.3 Accordingly, some forms of money are represented either tangibly or intangibly; issued centrally or on decentralised systems; processed on central or decentralised ledgers; and accessible widely or restrictively accessible. Extrapolating from this discussion, the thesis demonstrated that although cryptocurrencies do not fit into classical economic thinking of money in terms of commodities like metals, they however fit into the modern understanding of money, insofar as they continue to perform payment functions. One theme that emerged from the historical and theoretical discussions in Chapter II was the idea that, in relation to finance, law is elastic and does not apply consistently across the entire hierarchy of money. In other words, law is not equally rigid across the whole hierarchy but is relatively elastic at the apex than on the periphery. The consequence of this elasticity is that law is both indispensable and flexible at the same time. While legal provisions are essential in determining the emergence of new payment instruments as government money, such rules can usually be suspended or strictly applied depending on whether an emerging payment instrument is considerably beneficial to interests at the apex of the financial hierarchy.

2 Pistor, K., 'Law in Finance' (2013) 41, *J. Comp. Econ.,* pp. 311 - 314
3 BIS, 'The Money Flower' available at < https://www.bis.org/publ/qtrpdf/r_qt1709z.htm> accessed 12 February 2020

Chapter III undertook an exposition of regulation. Within this context, the chapter explored the underlying normative values and objectives that underpin regulation; and the extent to which regulatory design is deployed to the benefit of interest groups. Ultimately, Chapter III addressed questions concerning the extent to which underlying regulatory objectives adequately respond to issues of emerging innovation. Following this analysis, it is argued that financial regulatory design choices, as currently constituted, overly focus on a range of economic considerations such as efficiency, competition and 'public' protection. However, such economic considerations are often insufficient to address the range of issues in relation to emerging innovative technologies. In principle, sticking to such economic considerations render financial regulation manifestly incapable of responding to the array of new issues thrown up by emerging innovation. The chapter therefore found that the interests of an emerging technology like cryptocurrencies and cryptocurrencies are best served if additional non-economic factors are considered in setting regulatory agenda and choosing among competing objectives or normative values. Additional considerations such as objective knowledge of the innovative technology, peculiarities of the emerging cryptocurrency industry and concerns of interests of consumers.

Chapter III also argued that not adequately responding to innovation has consequences for technological progress and society. As such, failure of the policymaker to keep pace with technological innovation can lock emerging innovative technologies into a negative trajectory, preventing society from benefiting from its full importance. In this regard, Chapter III identified a range of non-economic factors, which the policymaker must consider in designing an appropriate regulatory response. The policymaker must obtain objective knowledge of the innovation; assess its benefits and problems; consider the rights of potential users; understand the underlying problems that trigger the emergence of innovative solutions; and pursue consumer protection that focuses on consumer interests such as personal liberty and freedom of choice.

To provide objective knowledge in order to critically evaluate its potential benefits and challenges, Chapter IV undertook an in-depth analysis of the nature of cryptocurrency

payments and the complex ecosystem developing around it. This chapter provided a detailed account of why cryptocurrencies are innovative and disruptive. Principally, cryptocurrencies make online peer-to-peer payments possible without the intervention of traditional financial intermediaries. More uniquely, cryptocurrency DLT makes it possible for electronic ledgers of payment transactions to be openly accessible, distributed to all payment parties while recording payment transactions in real-time. Also, the introduction of cryptocurrencies serves as a direct ideological challenge to state-monopoly over payments and the payments system. Beyond describing how cryptocurrencies work, Chapter IV also critically engages with its underlying agenda: disintermediation, introduction of anonymous online payments, decentralised control and transparency.

The chapter found that, enabled by anonymity and decentralisation, cryptocurrencies offer a range of economic benefits such as reducing transactional costs; allowing for fast payments, and delivering increased efficiency to cross-border digital payments. More crucially, however, cryptocurrencies also offer some non-economic benefits, particularly to users concerned about preserving privacy against rising government and commercial surveillance. In this regard, cryptocurrencies offer protection from surveillance, allowing payment parties to engage in P2P payments without the prospect of being monitored or having their data harvested, sorted or shared.

Regarding its future benefits, cryptocurrencies particularly offer a viable and anonymous alternative to cash, to fill the gap that will be created in a ‘cashless-driven’ society which will potentially exclude a vast amount of unbanked and underbanked people from participating in finance, conducting anonymous payment transactions over the internet, and increasing instances of theft or collection of personal data. In essence, although cryptocurrencies offer useful economic benefits, it also provides two crucial social benefits: cryptocurrencies provide a code solutions to emerging problems of surveillance in this informational age; and are potential substitutes to cash for online payments in a digital society. However, despite these economic and social benefits, cryptocurrencies present a significant number of problems in relation to criminality; market speculation which leads to price volatility; and functionality related issues.

Having identified its benefits and challenges, the thesis goes on to consider the adequacy of English Law, particularly its payments framework, to adequately address the issues. Chapter V engages in a doctrinal analysis of existing rules, particularly provisions of the PSR and EMR, in addition to Common Law principles. Our analysis particularly evaluates rules in relation to discharge, countermand and finality of payment instructions. The Chapter also considers how adaptable provisions of payments framework to new cryptocurrency entities such as wallet-service providers and exchanges.

The chapter finds that most provisions are incompatible and inapplicable to address the unique issues posed by cryptocurrency payments. For instance, there is no direct or indirect legal provision on how to ascertain liability for loss or misappropriation of cryptocurrencies by crypto-exchanges or wallet-service providers. Unlike with traditional payment systems that are based on transactional bank accounts, it is still unclear how to legally categorise the relationships between cryptocurrency holders and exchanges or wallet service providers. Furthermore, the law struggles to fit this technology into existing norms and frameworks of money and privacy.

Unfortunately, following on from the critical discussions in Chapters III and IV, the thesis argues that the incompatibility of existing legal framework is unsurprising and inevitable. The analysis of existing legal framework on payments provided scope to test the hypothesis and suggestions of LTF that law is never intended to serve all sections of the financial system equally. Its elasticity mean that law is deliberately designed to benefit interests of apex financial hierarchy. This is particularly demonstrated in Chapter VI where the introduction of the Electronic Money Directive was a response to the introduction of digital prepaid cards by commercial banks. Ultimately, the design of legal instruments is itself demonstrative of state power in franchising financial instruments and products of state-sanctioned gatekeepers of the financial system. As such, by design, existing law typically only adapts to emerging technology insofar as such technology directly emanates from or benefits interest of the apex of the financial system. Given that this is the case, it is not surprising that cryptocurrencies have yet to receive robust regulatory responses, both domestically and internationally. Granted, there are a few other issues which make it particularly difficult to regulate cryptocurrencies such as its cross-

border nature and the fact that it is still developing. However, the reluctance to regulate cryptocurrencies have more fundamentally been underpinned by tensions in relation to control.

Given this overarching tension, Chapter VI critically analysed the different governance approaches suggested or implemented to provide regulatory response to the novel issues of cryptocurrencies. Specifically, the chapter analyses how existing proposals would potentially address the unique features of cryptocurrencies and the extent to which such proposals incorporate the non-economic normative values and considerations discussed in Chapter III.

For the purpose of structure and systematic analysis, the chapter divided regulatory proposals into three broad categories - a fragmented regulatory model which targets specific problematic features of cryptocurrencies such as its anonymity or decentralisation; direct government interventionist model wherein governments contemplate direct intervention by issuing a state-backed alternative i.e. Central Bank Digital Currencies (CBDC); and corporate-focused approach which essentially advocate self-regulation and control by further introducing new generations of cryptocurrencies or 'stablecoins' as technical improvements to address problematic issues.

This chapter ultimately assesses the weaknesses and strengths of each proposal and finds, in relation to a fragmented model targeted at anonymity, that anonymity of cryptocurrencies is not necessarily bad. Although anonymity in payments make it difficult for public authorities to sufficiently monitor movement of money or investigate crime, it affords individual protections against big governments and profit-driven commercial entities from infractions with personal data. Ultimately, the issue of anonymity borders on tensions between privacy and national security. On this point, the thesis argued that the rise of electronic commerce and move towards a cashless society create problems which make protection of anonymity essential. As such, removing anonymity may address specific associated with criminality, but these will only be marginal. It will not address other issues such as price stability, payment related issues, uncertainty of crypto-exchanges and wallet-service providers. More importantly, such a model would ultimately

hamper further development of this technology and deprive society from harnessing any existing or future benefits.

In relation to direct government intervention through the issuance of CBDCs, the chapter found that they potentially provide solutions to peculiar problems of price stability and supplying the much needed government backing instrumental to achieving widespread public adoption. However, given the rise of cryptocurrencies as a censor-resistant or code solution to surveillance, CBDCs provide no solution to concerns of privacy or choice. In fact, CBDCs would undermine the innovative advancement of DLTs through decentralisation, disintermediation and could become a tool for governmental overuse or abuse. In relation to corporate-focused approaches, the chapter critically considered proposals for the launch of Libra by Facebook. As a purely private proposal, Libra pose some difficult problems. For instance, the lack of public accountability or the capitalist quest for profit make private initiatives like libra or other stablecoins even more dire that excessive government control. Chapter VI ultimately concludes that although existing regulatory proposals provide some useful answers to specific problems, they do not, however, provide a holistic governance framework which satisfactorily addresses the risks posed by cryptocurrencies and preserve the innovations embedded within it.

Surprisingly, although the thesis begins by taking a unique interdisciplinary approach to cryptocurrencies and regulation, it has become apparent that the centrepiece of this thesis is one which touches on broader social questions of privacy, choice, state control, and financial participation. Cryptocurrencys threaten to undermine and displace the entire financial system, along with its rules, institutions and conventional practices. Its ultimate agenda is to challenge the status quo and possibly create an alternate system. But the financial system is not only hierarchical, it is robust, complex and firmly protected by state influence. This emerging battle of forces, governments on the one hand and private innovators on the other ultimately pose questions of which side can deliver the most value. Within this context, exclusively relying on law will be counterproductive to the extent that, as the poet, Audre Lorde, once remarked, “the master’s tools will never dismantle the master’s house.” As such, the prospects of cryptocurrency completely replacing government-backed payments does not seem at all feasible or plausible.

That said, I acknowledge that both visions of how finance and payments should be controlled have their respective benefits and weaknesses. For instance, as Hockett & Omarova found, the hybrid nature of existing financial system means that the sovereign engages with services of private actors in an important processing of distributing its full faith and credit to such private actors.4 In other words, the capacity to mobilise resources by the state can be extended to commercial banks in order to provide credit necessary for stimulating the economy. Disintermediating finance, as proposed by crypto, would mean replacing or eliminating the entire financial intermediation system. The consequences of this on the real economy would be dire. Similarly, the cryptocurrency system is extremely automated to the extent it has become inflexible. In times of economic or social turmoil, such as with the outbreak of the coronavirus epidemic in early 2020, cryptocurrencies would be unable to react to shifts in money demand. It would be practically impossible for the state, operating an automated cryptocurrency system to, for instance, provide monetary relief to targeted sectors adversely affected by extraordinary shortages in patronage.

On the other hand, there is an extent to which cryptocurrencies provide an ethnically sound alternative to the existing system. Beyond its promise of improved efficiency, cryptocurrencies are a response to a long history of breach of consumers' trust in fiat currencies. As such, cryptocurrencies propose an alternative system which entirely eliminates the need for trust and allows for direct payment dealings. Even more significant is the manner in which financial institutions have leveraged on consumers' personal payments data to sort and label such consumers in terms of risk, credit worthiness, insurance, mortgage *et cetera.* It is in this regard that cryptocurrency offers its biggest contribution to the financial system. Unfortunately, both extremes are problematic. Enhanced privacy with less credit is as societally disadvantageous as low interest credit with excessive data infringements.

4 Hockett, R., and Omarova, S., 'The Finance Franchise' (2017) 102, *Cornell L. Rev.* pp. 1143

7.2 RECOMMENDATIONS

This thesis has argued that cryptocurrency payments are a revolutionary technological achievement that heralds potential benefits to payments and human welfare. However, like other technological innovations that can be put to good and bad uses, cryptocurrency technology can be utilised to facilitate criminal activity. The challenge for the policymaker is to design a governance framework that fosters its beneficial uses while minimising any negative consequences on further innovation, consumers and the payments system. This thesis therefore makes the following substantive recommendations to aid the policymaker meet this challenge.

7.2.1 Re-Conceptualising and Re-Categorisation

Given the conceptual challenge of fitting cryptocurrencies into pre-existing legal frames on money, there is need to approach its conceptualisation differently. In this regard, it is worthwhile to consider the feasibility of situating cryptocurrencies into a new category as intangible assets with the benefit that rules regarding the manifestation of legal title, transfer and legal protection of commercial dealings in connection with exchange of assets can become applicable, hence providing a useful framework for addressing the payment-related issues highlighted earlier on in the thesis.

In relation to whether it is plausible to take a property law approach in relation to crypto-governance, reference need to be made to whether money itself is or can be treated as property. Discussions in Chapter II highlighted that money is a manifestation of an underlying asset i.e., whether as tangible property like metals5 or as intangible choses in action. Well, what assets underpin cryptocurrencies? Our first task here is to take a closer look at what constitutes the exchange tokens of cryptocurrencies. A cryptocurrency, like fiat currency, functions as a medium of exchange but the source of its value is extrinsic to itself. Rather, its value is imposed by the collective belief of the people who use it.6 At its

5 Our discussions on classical theories on money in Chapter II outline the affiliation of money with commodities. Although modern finance has discountenanced with commodities such as with during the 'gold standard', conceptual and theoretical understanding remains committed to the separation between the manifestation of money and its inherent value or component.

6 Our discussions in Chapter II dwelt on the distinctions between money's extrinsic and intrinsic value. Intrinsic value here referring to the value which underpins the external manifestation of a monetary medium.

core, cryptocurrencies (both as an exchange or security token) are underpinned by a string of data which takes its form from recordings of transactions on the distributed ledger system, manifested as a readable sequence of characters to evidence transactional outputs. This string of data is often called a *'hash'.* Spending cryptocurrencies require a holder of the output data to use it as input for subsequent transaction.7 Unlike with traditional money transactions recordable on account ledgers to detail net balances, the recording of cryptocurrency transactions on the distributed ledger details the existence and value of transactions between different holders' addresses (public keys). Each transaction creates a unique identity, and forms the recipe for building new transactions. In essence, cryptocurrency transactions are merely the transfer of recorded data.

To be duly regarded as property, the string of data which underpins cryptocurrencies must be shown to possess some measure of exclusivity.8 In economics, property rights only accrue on tangible or intangible "*goods*" if such goods are both "*rivalrous*" and "*excludable*".9 A "*good*" is said to be '*rivalrous'* if its consumption by one person prevents a simultaneous consumption by another. Also, "*goods*" are "*excludable*" in the sense that a holder can exclude third-parties from transacting or dealing with them.*10* In relation to cryptocurrencies, despite not qualifying as 'legal tender' and 'payment instruments' under English Law, do they however possess the unique characteristics which could vest exclusive ownership rights on one individual over others? It is the view here that they indeed do. Unlike other forms of data, cryptocurrencies as particularly *rivalrous* to the extent that one person's consumption of its underpinning data necessarily depletes the consumption of the same data by another person. Also, cryptocurrencies are *excludable* in the sense that it is technically possible, using cryptography, to limit its consumption to individuals who have access, either by purchase or gifting, thereby excluding persons with no title rights from consuming its data. Therefore, what is

7 Fox, D., and Green, S., (eds) *Cryptocurrencies in Public and Private Law* (OUP 2019) 143
8 Murray, A., *Information Technology Law,* (4th edn, OUP 2019) 55
9 Paul Samuelson, 'The Pure Theory of Public Expenditure' (1954) 36(4), *Review of Economics and Statistics,* pp. 387
10 Miscione, G., *et al.,* 'Tribal Governance: The Business of Blockchain Authentication' (2018) *Zurich Open University and Archive*, Available at <https://www.zora.uzh.ch/id/eprint/152116/1/paper0568.pdf> accessed 21 December 2018

transferred between payment parties is essentially the unique sequence of valuable data which carry ownership rights similar to exclusive property rights.*11*

If, by our discussions above, cryptocurrencies can be classified as producing exclusive property rights, would they public or private in nature? This distinction is important, particularly within the context of internet usage, as it determines the extent to which property can be subject of ownership. Paul argued that there are two categories of goods: private consumption goods and public consumption goods. Public consumption goods are goods which everyone commonly consumes in the sense that each individual's consumption leads to no subtraction from any other individual's consumption of the same good. Private consumption goods, on the other hand, are goods which can be parcelled out among different individuals.12 In this sense, a public property cannot belong to any one person and cannot be restricted to any one person's possession or use.13 As such, it would be implausible to confer ownership rights on public properties. In the context of internet interactions, would the fact that cryptocurrency's unique data are publicly viewable on the distributed ledger amount to public ownership and vitiate any exclusive property rights?

I contend here that, because the blockchain uses a combination of public and private keys in the completion of payment transactions, cryptocurrencies do not fall squarely within the conceptual idea of 'public' or 'private' goods. Instead, may more suitably fall within a third category of goods – *"club goods"* – a type of public goods that exhibit high excludability but also remaining non-rivalrous.14 Club goods are public in nature but are consumable in an excludable manner. Examples of such consumption goods are gym memberships, subscription for online services or consumption of copyright items. The

11 Cryptocurrencies are often defined as a digital representation of value that can be digitally traded and functions as a medium of exchange, unit of account and store of value but lacks legal tender status. But more specifically, cryptocurrencies utilise advanced cryptography to encode data which is then traded or transferred for value between network participants. As such, every unit of a cryptocurrency is essentially a digital hash of data containing strings of information about transactions on a distributed ledger.

12 Samuelson, P., 'The Pure Theory of Public Expenditure' (1954) 36(4), *Review of Economics and Statistics,* pp. 387

13 *Ibid*.

14 This idea has its roots in the Club Theory first espoused by James Buchanan in 'An Economic Theory of Clubs' (1965) 32(125), *Economia*

combination of its unique attributes, I argue, necessitates that cryptocurrencies fall within the legal category of incorporeal, intangible and immaterial objects and make it increasingly possible to use its *value data* for payment purposes.

This approach however has its limitations. Unfortunately, despite the fact that there are real questions about ownership of data in this information age, the legal regime for regulating this new asset category is also yet to be finalised in many legal jurisdictions, including under English Law. As such, many questions which affect cryptocurrencies also affect this new emerging asset class, such as legal entitlements to intangible assets deposited with third-parties, liabilities for loss of such assets, the allocation of legal responsibility and conflict of laws.

7.2.2 Anonymity: Its importance to Democratic Values

A significant portion of this thesis has argued that decentralisation and anonymity provides users a "level of privacy" by limiting third party access to users' personal information.15 Given that cryptocurrencies are essentially comprised of strings of data, it is important to understand how cryptocurrencies promote freedom, privacy and autonomy in society. As argued in Chapter VI, surveillance and collection of users' personal data is becoming a recurrent phenomenon in society. The benefits of anonymity are however two-fold. First, the anonymity of cryptocurrencies serve as useful protection against existing internet platforms that enjoy enormous market power due to their monopolies, such as Amazon and Facebook. While facilitating traditional online payment transactions driven by commercial banks, these platforms are able to harvest enormous amounts of user data that are sold on to advertisers and, in some cases, handed over to governments for surveillance purposes. Personal data which indicate shopping habits, track location, monitor internet searches and browser-fingerprinting have evolved into a complex

15 Nakamoto, S., 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2009) available at <http://www.bitcoin.org/bitcoin.pdf> accessed 12 February 2020

operation.16 Private data has become extremely weaponised, often exposing citizens to undue surveillance, breaches of privacy and depreciation of autonomy.

Secondly, anonymity has proven useful as a form of free expression against repressive regimes abroad. So, for instance, while the UK may not necessarily have this problem, many residents who wish to support democratic engage can become inhibited by stringent money transfer rules applicable in those countries. It is within these contexts that cryptocurrency can become a credible alternative as a form of protection from government crackdowns on free speech.

The increasing ability of governments and commercial entities to collect vast amounts of personal data, as argued in Chapter VI, has catastrophic implications for society. For example, often when data is collected, it allows citizens to be sorted and profiled into vague categories.17 As Edward notes, "increasingly, we live in a society where everything we do leads to us being classified in various not wholly transparent ways: as shoppers, as consumers, as viewers, as citizens or as risky members of society."18 The 'big data' often harvested from citizens become instrumental in designing financial products, setting prices, or tailoring mortgage rates. As such, the worries go beyond privacy, they ultimately determine employment, credit, education or reputational prospects. In this regard, especially in relation to the role of traditional money in these data collection schemes, cryptocurrencies provide a code solution because it provides a better way to manage personal data.

7.3 CONCLUDING THOUGHTS

Although cryptocurrencies are markedly different from existing forms of digital payment, they represent a leap forward within the broader historical context of evolving payment technologies. As such, cryptocurrencies not only open new avenues for exploration but they also give rise to new challenges. In addition to being attractive for criminal purposes,

16 Nikiforakis, N., and Gnes, A., 'Browser Fingerprinting and the Online-Tracking Arms Race' (IEEE Spectrum, 25 July 2014) Available at < https://spectrum.ieee.org/computing/software/browser-fingerprinting-and-the-onlinetracking-arms-race> accessed 21 February 2020

17 Gandy, O., '*The Panoptic Sort: A Political Economy of Personal Information. Critical Studies in Communication and in the Cultural Industries* (Westview Press, Inc 1993) 34

18 Edwards, L., (ed), *Law, Policy and The Internet* (Hart Publishing 2019) 121

they introduce new players into the payments system, particularly wallet-service and crypto-exchange platforms. Furthermore, by challenging the relevance of traditional roles performed by incumbent payment institutions, cryptocurrency may pave the way for a new architecture for the payment system. This has made our discussions on legal or regulatory response quite problematic for several reasons. For instance, as an emerging technology, the conceptual revolution it is leading will definitely require more than an adaptation of existing laws. It will require new rules, categories and definitions that take into consideration the evolving dynamics of cryptocurrency operations. In any case, as has been demonstrated throughout the thesis, existing legal rules are insufficiently equipped to objectively address issues posed.

It is undeniable that as technology becomes increasingly complex, traditionally physical and digital forms of money will encounter transitions similar to those experienced in other industries such as media, communications, entertainment and transportation sectors. Moreover, like in many industries where technological innovation has disrupted orthodox systems, it is doubtful whether the incursion of technology into finance and payments should continue to be led and controlled by the state and its franchised institutions. This thesis makes the case that there is need to open up the financial sector to new technology that can significantly increase financial inclusion, guarantee data protection and a multiplicity of choice. Granted, there will continue to be a need for active regulation to address questions of cyber and financial crime committed using cryptocurrencies. However, there is no evidence to suggest that legally excluding cryptocurrencies all together will curtail such illicit activities or necessarily lead to their abatement. Going forward, the policymaker and law enforcement will need to proactively increase their capacity to keep up with technological change by incorporating such technologies into their processes. In this regard, there is scope to further explore how regulatory technologies may serve as a better tool for governance, regulation and law enforcement. Ultimately, any future regulatory framework must recognise that, to a larger extent, cryptocurrency technology is neutral. It is only as good or bad as those who operate it. Given this fact, regulation or governance of crypto-payments must not restrict its further development. Attempt to restrict its use will only harm legitimate uses while leaving its illicit use largely unaffected.

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