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Computer programmers, coders, and technology engineers have promoted the advantages of innovative new digital systems and tools for over a decade since the introduction of Bitcoin by Satoshi Nakamoto in a 2008 White Paper.[1] Distributed ledger technology (DLT), blockchain, and smart contracts were meant to herald a new dawn in choice, efficiency, and security. Regulatory and monetary authorities have monitored developments usually from a distance and on a technology neutral basis. No major disruptions in terms of monetary or systemic instability concerns have been identified, principally due to the limited size and scalability of the new technology. This would all change with the potential and imminent launch of Libra. Libra represents the most significant advance in digital coin technology (CoinTech) or token technology (TokenTech) since Bitcoin was launched. With its value fixed to a basket of currencies or single currency option, Libra constitutes a new advance in stablecoin technology (StableTech).[2] This represents a major disruptive event or "Big Bang" in CoinTech and payment technology (PayTech) within a larger new area of data technology and DataTech.[3] Facebook has specifically created a new form of BigTech coin (BigCoin or SuperCoin) which parallels the super digital applications (SuperApps) such as those developed by AliPay and WeChat in China.[4]

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1. *See generally* SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM (2008).

2. *See* discussion *infra* Section I.

3. Dirk A. Zetzsche, et al., *The Future of Data-Driven Finance and RegTech: Lessons from EU Big Bang II* (Eur. Banking Inst., Working Paper 2019/35, 2019). *See also* Dirk A. Zetzsche, et al., *Regulating Libra: The Transformative Potential of Facebook's Cryptocurrency and Possible Regulatory Responses* (Eur. Banking Inst., Working Paper Series 29/44, 2019) (describing the development of new database regulation within the European Union in response to the development of data driven finance as constituting as Big Bang).

4. AliPay and WeChat were able to develop fully integrated mobile applications that allowed consumers to enjoy a full range of banking and financial services through a single programme. This can be referred to as a "SuperApp." *See generally* 2019 BIS Ann. Rep. (June 23, 2019), https://www.bis.org/publ/arpdf/ar2019e.pdf; Jon Frost, et al., *BigTech and the Changing Structure of Financial Intermediation*, (BIS, Working Paper No. 779, April 8, 2019), https://www.bis.org/publ/work779.pdf; Dennis Ferenzy, *A New Kind of Conglomerate: BigTech in China*, INST. INT'L FIN. (IIF) (Nov. 2018), https://www.iif.com/Portals/0/Files/chinese_digital_nov_1.pdf.

Digital technology has created a new world based on digital information and digital data with many markets, economies, and societies more generally becoming data driven. Massive difficulties nevertheless arise in determining the nature of information, data, and new forms of digital assets.[5] This includes digital coins or cryptocurrencies and other tokenized assets[6] and, in particular, whether these constitute property in law. Over 8,450 new digital coins and tokens have been created in recent years.[7] A substantial number of new digital financial platforms have also been launched. Separate issues arise in classifying all of the different types of digital coins and tokens created.[8] A new digital ecosystem has been created that requires a separate revolution in legal and regulatory language and analysis to understand and manage.

New technology (NewTech) has advanced immeasurably in recent decades. This includes core or infrastructure technology (InfraTech)[9] and new applied technology (AppliedTech), which can both be considered to form part of new FutureTech.[10] Many aspects of CoinTech and PayTech as well as wider FutureTech will be brought together for the first time with the Libra experiment and LibraTech. This includes DLT and decentralization, coin creation, identification, cryptography, ledger, hashing, consensus, structure, wallet provision, connection or interoperability, and code and

5. Walker defines information as any statement or point of fact, opinion or law with data being structured information collected in accordance with set parameters or constraints. Knowledge represents processed or applied information or data used in accordance with specific policy objectives. *See generally* G.A. Walker, *Digital Information Law - Meaning, Challenge and Future*, 53 INT'L LAW. (forthcoming 2020).

6. Tokenisation refers to the use of digital tokens on blockchain or other distributed ledgers to represent other real assets possibly held on a separate physical or electronic register such as for land, ships, aircraft, automobiles or precious metals. *See The Latham & Watkins Glossary of Cryptocurrency & Blockchain Technology Acronyms, Slang, and Terminology*, LATHAM & WATKINS 33 (2019), https://www.lw.com/admin/Upload/Documents/Book_of_Jargon_Cryptocurrency_Blockchain_Technology.pdf.

7. A twelve-part chronology can be constructed of the history of digital coins and tokens based on: Bitcoin; Bitcoin Correction; Consensus & Layering; Digital Coin Extensions; Payment Tokens; Anonymity & Privacy; Stablecoins; Smart Contracts; Digital Tokens; Experimentation; Initial Coin Offerings (ICOs); Governance & Innovation.

8. An eight-part taxonomy can be constructed for the purposes of this paper using formal legal and regulatory definitions based on: Exchange or Monetary token; Real asset token; Utility token; Security debt token; Security equity token; Community token; Donation token; and Reward token. On taxonomies, see G.A. Walker, *Regulatory Technology (RegTech) Construction of a New Regulatory Policy and Model* 54 INT'L LAW. (forthcoming 2021) Section 4(3) and (note 245).

9. This includes micro, parallel, and quantum computing, cloud, fog, and edge computing, telecommunications, blockchain and graph technology (such as Directed Acyclic Graphs (DAGs)), decentralisation and DLT and further advances in internet and world wide web service provision.

10. This includes digital coding, automation and smart contracts, biometrics and advanced cryptography, Big Data analytics, applied robotics, nanotechnology and biotechnology, machine reading, machine learning and machine intelligence and Artificial Intelligence (AI) and Machine Sentience (MS).

governance.[11] Facebook has decided to confront all of these technical challenges directly in a public and transparent manner. The development of private StableTech also places increased pressure on national monetary authorities to develop new forms of central bank digital currency (CBDC or possibly CentralTech) as an alternative or replacement payment option.

Facebook has also announced that it will attempt to resolve all of the separate legal and regulatory challenges that arise in an equally direct and open manner.[12] The fundamental difficulty that arises is an inherent conflict between global technology and local control, which cannot be managed through existing supervisory and regulatory means.[13] A separate single market and local access and control conflict was created within the European Union and other regional markets.[14] This has re-emerged as a virtual and real or domestic law conflict has emerged more recently with the growth of the Internet and online commercial, banking, and financial services. This creates its own conflict between new technology and traditional market supervisory and regulatory practices. A more fundamental underlying law and code conflict also arises with a shift to computer programming and automation in terms of regulatory control. All of this can be resolved through the creation of a single global technology ecosystem around Libra coin and LibraTech with supervision and regulation continuing to be managed on an a fragmented and essentially uncoordinated and distinct local and domestic basis.

International authorities have been monitoring developments in the area. A number of papers have been issued on cryptocurrencies,[15] cryptoassets,[16]

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11. This creates a twelve-point technical architecture based on: decentralisation; asset digitalisation; identity digitalisation; access cryptography; transaction hashing; record (transaction or account) structure; reconciliation or consensus mechanism; block or graph format; interface and wallet provision; linkage and interoperability; computer code; and governance. This can be restated and summarised in terms of: architecture; asset; anonymity; access or availability; arrangement; authentication; accord or agreement; assembly; administration; attachment; authority; and accountability, assessment and amendment. On the difficulties that arise with regard to Libra, *see* discussion *infra* Section VI.

12. *Id.*

13. *See generally* G.A. WALKER, INTERNATIONAL BANKING REGULATION LAW POLICY AND PRACTICE (Kluwer London 2006) (summarising the core difficulty that arises with regard to international financial market management in terms of an essential single global market and local control conflict).

14. *See generally* G.A. WALKER, EUROPEAN BANKING AND FINANCIAL PROGRAMME (BCCI London 2011) (constructing a parallel perspective based on regional trading systems such as the European Union).

15. *See* Eur. Banking Auth. [EBA], *EBA Opinion on 'Virtual Currencies'*, EBA/Op/2014/08 (July 4, 2014); Dong He, et al., *Virtual Currencies and Beyond: Initial Considerations*, SDN 16/03, INT'L MONETARY FUND [IMF] (Jan. 20, 2016); Fin. Conduct Auth. [FCA], *Discussion Paper on Distributed Ledger Technology*, DP17/3 (Apr. 2017); Fin. Conduct Auth. [FCA], *Fair Pricing in Financial Services: Summary of Responses and Next Steps*, FS19/04 (July 2019); Robby Houben & Alexander Snyers, DIRECTORATE-GENERAL FOR INTERNAL POLICIES OF THE UNION (EUROPEAN PARLIAMENT), *Cryptocurrencies and Blockchain, Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion*, PE 6.19.024, at 23, (July 9, 2018), https://

and CBDC.[17] The launch of Libra has most recently led to a new focus by authorities on the regulatory challenges that arise with regard to stablecoins.[18] This includes the establishment of a G7 Working Group on Stablecoins which has been examining the issues that arise with regard to global stablecoins (GSCs) with other bodies including the International Monetary Fund (IMF) and Committee on Payments and Market Infrastructures (CPMI) at the Bank for International Settlements (BIS).[19]

None of this, however, has created the necessary formal processes, procedures, or standards necessary to manage innovation on the scale of Facebook's Libra. National authorities have considered innovative projects, including regulatory sandboxes,[20] to support market advances such as with the U.K. Financial Conduct Authority's (FCA) Project Innovate and separate new Global Financial Innovation Network (GFIN).[21] These measures are nevertheless principally based on promoting financial and

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op.europa.eu/en/publication-detail/-/publication/631f847c-b4aa-11e8-99ee-01aa75ed71a1/language-en (Eur. Parl.).

16. *See, e.g.*, *Cryptoassets Taskforce: Final Report*, CRYPTOASSETS TASKFORCE, HM TREASURY, FCA, BANK OF ENGLAND (Oct. 2018), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf; Fin. Conduct Auth. [FCA], *Guidance on Cryptoassets*, CP19/3 (Jan. 2019); Eur. Secs. Mkts. Auth. [ESMA] Secs. & Mkts. S'holder Grp. [SMSG], *Own Initiative Report on Initial Coin Offerings and Crypto-Assets*, ESMA 22-106-133819 (Oct. 2018); Eur. Cent. Bank [ECB], ECB Crypto-Assets Task Force, *Crypto-Assets: Implications for Financial Stability, Monetary Policy, and Payments and Market Infrastructures*, No. 223 (May 11, 2019); *Crypto-Assets: Work Underway, Regulatory Approaches and Potential Gaps*, FIN. STABILITY BD. [FSB] (May 31, 2019), https://www.fsb.org/wp-content/uploads/P310519.pdf; *Wholesale Digital Tokens*, BANK FOR INT'L SETTLEMENTS [BIS], COMMITTEE ON PAYMENTS AND MARKET INFRASTRUCTURE [CPMI] (Dec. 2019), https://www.bis.org/cpmi/publ/d190.pdf.

17. CPMI & Markets Committee, *Central Bank Digital Currencies*, BANK FOR INT'L SETTLEMENTS [BIS], (March 2019), https://www.bis.org/cpmi/publ/d174.pdf; Christian Barontini & Henry Holden, *Proceeding with Caution: A Survey on Central Bank Digital Currency*, BANK FOR INT'L SETTLEMENTS [BIS], COMMITTEE ON PAYMENTS AND MARKET INFRASTRUCTURE [CPMI], (Jan. 2019), https://www.bis.org/publ/bppdf/bispap101.pdf.

18. *See Regulatory Issues of Stablecoins*, FIN. STABALITY BD. [FSB] (Oct. 18, 2019), https://www.fsb.org/wp-content/uploads/P181019.pdf; Dirk Bullmann, et al., *In Search for Stability in Crypto-Assets: Are Stablecoins the Solution?*, EUR. CENT. BANK [ECB], Occasional Paper Series No. 230 (2019), https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op230~d57946be3b.en.pdf; Eur. Cent. Bank [ECB], *Stablecoins – No Coins, but Are They Stable?*, IN FOCUS No 3. (Nov 2019). https://www.ecb.europa.eu/paym/intro/publications/pdf/ecb.mipinfocus191128.en.pdf.

19. The Working Group is made up of senior officials from G7 central banks with representatives from the IMF, BIS, and FSB with the Secretariat provided for by the CPMI. G7 Working Group on Stablecoins, *Investigating the Impact of Global Stablecoin*, G7, IMF & CPMI (Oct. 2019), https://www.bis.org/cpmi/publ/d187.pdf; Press Release, Benoît Cœuré, Chair of the Committee on Payments and Market Infrastructures, Update from the Chair of the G7 Working Group on Stablecoins (July 18, 2019), https://www.bis.org/cpmi/speeches/sp190718.pdf.

20. *What Is a Regulatory Sandbox?*, BBVA (Apr. 26, 2018), https://www.bbva.com/en/what-is-regulatory-sandbox/.

21. *FCA Innovation – FinTech, RegTech and Innovative Businesses*, FIN. CONDUCT AUTH. [FCA] https://www.fca.org.uk/firms/innovation (last visited Aug. 7, 2020).

market innovation, rather than protecting financial stability and other policy stability, although relevant market threats are clearly taken into account. Libra challenges national and international authorities to develop effective new control models in a new digitally integrated data driven world.

A series of issues accordingly arise with regard to Facebook's Libra coin and stablecoins, GSCs, and StableTech more generally. This can be understood in terms of legal and regulatory definitions, technological challenges, and wider policy concerns. Legal determinations arise with regard to whether stablecoins should be regulated as money, payment, banking, security, commodity, a collective investment scheme, market infrastructure, note issuance and legal tender, counterfeiting, anti-money laundering and terrorist financing, data protection and information provision, and financial inclusion.[22] Financial control has to be reconsidered in terms of ensuring effective financial regulation, supervision, resolution, support, and wider macro-prudential oversight.[23] A separate series of technical challenges have to be resolved especially in terms of decentralization, digitalization, identity, cryptographic access, title transfer, transaction hashing, reconciliation and consensus, blocking, scalability and resilience, wallet provision or interface, interoperability and smart function, code, and governance.[24]

Eight further areas of new policy control and concern can also be identified. These specifically consist of market power and competition policy, market integrity policy, monetary policy, monetary stability, taxation policy, consumer protection policy, financial integrity, and overall financial stability policy. A number of specific challenges arise in connection with each of these, requiring new solutions and responses. A new direction may specifically be possible by constructing a new post-financial technology or post-technology agenda designed to ensure technology, legal and regulatory, policy, and financial integrity based on a series of new integrated and technology-based mechanisms and solutions. All of these have to be resolved in an effective and integrated manner before GSCs can specifically be allowed to operate. A series of enhanced new regulatory and supervisory mechanisms will have to be designed to achieve all of this in practice.

The potential substantial growth of BigTech, DataTech, and StableTech present substantial difficulties in terms of maintaining national and international financial stability. The idea of financial stability itself has to be extended to include all new relevant exposures and vulnerabilities. Libra represents only one example of possible new global systemically important coins (GSICs) or products (GSIPs) that could arise.[25] The Libra challenge is

22. *See* discussion *infra* Section V.

23. *See* discussion *infra* Section VII.

24. *See* discussion *infra* Section VI.

25. While recent regulatory focus has been on Global Systemically Important Financial Institutions (GSIFs), it is also necessary to consider Global Systemically Important Financial Groups (GSIGs), Markets (GSIMs), Activities (GSIAs) and Risks (GSIRs) as well as equivalent Domestic Systemically Important Financial Firms (DSIFs), Groups (DSIGs), Markets (DSIMs),

to construct an effective new regulatory and control framework that can respond to all of these challenges.

The purpose of this paper is to outline the background to the changes in financial markets and growth of Big Tech, DataTech, and StableTech that have occurred in recent years. The nature, structure, and operation of Facebook's Libra coin is then examined in further detail with specific reference to Libra, the Libra Foundation, Novi digital wallet, Libra reserve pool, and early regulatory reaction. The core legal and regulatory issues that arise are outlined. Technical difficulties are referred to separately. Wider core policy issues and challenges are assessed in further detail. A series of provisional comments and conclusions are drawn with observations for further reform. A number of recommendations are made with regard to the construction of a new international legal, regulatory, and policy framework to manage all of the exposures created by such new stablecoins, SuperCoins, or SuperApps.

I. Bigtech, Newtech, and Stabletech

BigTech firms have increasingly begun to provide financial related activities creating alternative forms of NewTech, "TechFin"[26] or "BigFin." Major BigTech firms have been moving into finance for a number of years. These include Facebook (FB), Amazon (AMZN), Alphabet (GOOGL) as well as Alibaba (BABA) and Tencent Holdings (0700.hk) in China. The largest U.S. companies, Google, Amazon, Facebook, and Apple are referred to as the big four, or GAFA, or alternatively the GAFAM with Microsoft. The BIS has recommended the creation of a "new regulatory compass" in response to BigTech's advance.[27]

A number of major BigTech firms have expanded their financial services activities in advanced economies and in emerging markets.[28] Payment services are generally offered initially through existing systems with credit, insurance and savings, with investment products being provided through

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Activities (DSIAs) and Risks (DSIRs). *Global Systemically Important Financial Institutions*, FIN. STABILITY BD. (FSB) (June 28, 2020), https://www.fsb.org/wp-content/uploads/P280620-1.pdf.

26. Zen Soo, *TechFin: Jack Ma Coins Term to Set Alipay's Goal to Give Emerging Markets Access to Capital*, SOUTH CHINA MORNING POST (Dec. 2, 2016), https://www.scmp.com/tech/article/2051249/techfin-jack-ma-coins-term-set-alipays-goal-give-emerging-markets-access; Agustín Carstens General Manager, Bank for Int'l Settlements, Keynote Address (Dec. 4, 2018) *in Big Tech in Finance and New Challenges for Public Policy*, BANK INT'L SETTLEMENTS [BIS] (Dec. 4, 2018), https://www.bis.org/speeches/sp181205.pdf; *FinTech and Market Structure in Financial Services: Market Developments and Potential Financial Stability Implications*, FIN. STABILITY BD. (FSB) (Feb. 14, 2019), https://www.fsb.org/wp-content/uploads/P140219.pdf.

27. 2019 BIS Ann. Rep., *supra* note 4.

28. These include Amazon, Apple, e-Bay/PayPal, Facebook, Google, and Microsoft (global), Groupon, Orange (France), Line, Rakuten, and NTT Docomo (Japan) in advanced countries. *Id.* Alibaba/Alipay, Tencent, and Baidu (China), Samsung, KT, and Kakao (Korea), Go-Jek, Ola Cabs, and Grab (South East Asia), Mercado Libre (Argentina, Brazil, and Mexico), and Vodafone M-Pesa (East Africa, Egypt, and India) in emerging countries. *Id.*

existing financial institutions or directly.[29] Finance only represented eleven percent of BigTech income in 2018, although this was expected to rise substantially.[30] The largest BigTech companies have a market capitalization in excess of the largest banks in the world.[31]

Market penetration has grown most substantially in the payments area. In China, Alipay has 500 million active users (thirty-six percent of the population in China) and WeChat 900 million users (sixty-five percent).[32] The U.S. mobile payments market was worth $112 billion with Apple Pay having 22 million users and Google Pay 11.1 million clients.[33] BigTech credit volumes have remained low with FinTech credit only representing 0.5% of total private sector credit with this expected to increase substantially.[34] BigTech companies generated forty-six percent of income from information technology and consulting with eleven percent from financial services.[35] Payment services in western countries are generally provided on an overlay basis and in China on a proprietary model basis.[36] Money market funds (MMFs) expanded substantially in China especially with Alipay's Yu'ebao growing to become the largest MMF in the world with 350 million customers and $150 billion under management.[37]

BigTech growth has been driven by unmet customer demand, consumer preferences, data access, technological advantage, funding availability, regulatory gaps, and lack of competition.[38] BigTech companies benefit from their established customer base, brand recognition, and the complementary nature of existing and new functions.[39] BigTech companies use Data analytics, Network externalities, and interwoven Activities which is referred to as their "DNA."[40] Financial services benefit from and strengthen this DNA feedback loop with significant DNA synergies available.[41] BigTech companies generally operate as online multi-sided platforms (MSPs) and follow a traditional "birth, growth, and maturity" cycle.[42] BigTech benefits from lower information and transaction costs and enhanced financial

29. Frost, et al., *supra* note 4.

30. Alexandra Scaggs, *Big Tech Companies Are Becoming Big Banks so a Global Regulator Wants New Rules*, BARRON'S (June 25, 2019), https://www.barrons.com/articles/finance-banking-big-tech-new-rules-global-regulator-facebook-libra-amazon-alphabet-51561411986.

31. Vichett Oung, et al., *BigTech in Finance: Market Developments and Potential Financial Stability Implications*, FIN. STABILITY BD. [FSB], 4, fig.1 (Dec. 9, 2019), https://www.fsb.org/wp-content/uploads/P091219-1.pdf.

32. Frost, et al., *supra* note 4, at 6.

33. *Id.*

34. Stijn Claessens, et al., *FinTech Credit Markets Around the World: Size, Drivers and Policy Issues*, BIS Q. Rev. 29, 34, graph 1 (Sept. 2018), https://www.bis.org/publ/qtrpdf/r_qt1809e.pdf.

35. 2019 BIS Ann. Rep., *supra* note 4, at 56.

36. *Id.* at 58.

37. *Id.* at 59.

38. *Id.* at 63–64.

39. *Id.* at 61.

40. *Id.* at 62.

41. *Id.*

42. *Id.* at 63.

inclusion.[43] Data access allows BigTech companies to reduce screening and monitoring costs,[44] improve credit scoring,[45]and decrease collateral with online systems by having direct credit lines and being able to benefit from the threat of downgrade or exclusion.[46] The use of big data analysis and artificial intelligence can improve credit assessment.[47] Difficulties can nevertheless arise with possible market concentration, reduced competition, and the possible misuse of data.[48]

The largest BigTech companies in China have grown substantially in recent years. They have been able to benefit from the leveraging of investment in new technologies, more relaxed data protection laws, and strategic relations with the Chinese government.[49] Companies are allowed access to valuable consumer data in exchange for providing more efficient public services.[50] Banking, shopping, and entertainment data is used to improve municipal service provision including on transportation and healthcare.[51] This has allowed the creation of a new form of data driven corporate power linked to the provision of public services.[52] The Chinese companies' capture of the domestic market may limit competitive opportunities to overseas firms, while China's BigTech access to U.S. and European markets will be constrained by tighter data controls and national security conditions. Western and Asian BigTech companies may then compete for market positions in other countries across the world.[53]

The creation of Facebook's Libra as a stablecoin brings together BigTech and StableTech.[54] The objective is to reduce volatility and promote confidence and usage through increased value stability.[55] A number of stablecoins have already been created and are in operation, although none before Libra have raised significant regulatory concerns due to their limited size.[56] This has compelled authorities to assess for the first time all of the immediate and wider policy issues that may arise with regard to private stablecoins and StableTech.[57] This has also forced authorities to reconsider bringing forward the introduction of public CBDC as a credible alternative

43. *Id.* at 62.
44. *Id.* at 64.
45. *Id.* at 65.
46. *Id.* at 67.
47. *Id.* at 66.
48. *Id.* at 67–68.
49. Ferenzy, *supra* note 4.
50. *Id.*
51. *Id.* at 26–27.
52. *Id.* at 27.
53. *Id.*
54. LIBRA, https://libra.org/en-US/ (last visited July 18, 2020).
55. *Vision*, LIBRA, https://libra.org/en-US/vision/ (last visited July 18, 2020).
56. *See* Marco Di Maggio & Nicholas Platias, *Is Stablecoin the Next Big Thing in E-Commerce?*, HARV. BUS. REV. (May 21, 2020), https://hbr.org/2020/05/is-stablecoin-the-next-big-thing-in-e-commerce (discussing the growth of stablecoin, the companies creating stablecoin, and the evolution of regulating stablecoin).
57. *Id.*

to private stablecoins.[58] The most substantial earlier successes in this area appear to have been generated by the Chinese People's Bank of China (PBOC) with its Digital Currency Electronic Payment (DCEP) initiative which may launch in 2020 or 2021.[59]

Currently, there are around twenty-seven stablecoins in active trading,[60] around fifty-four under development,[61] and possibly 310 related businesses.[62] The total market capitalization of stablecoins is around €4.3 billion which represents 4.5% of a total €96 billion digital coin market.[63] $260 million dollars has been raised in venture funding for stablecoins.[64] Stablecoins can be classified in different ways.[65] Three principal types of stablecoins can be distinguished with tokenised funds,[66] collateralised funds (on or off-chain),[67]

58. *See* Ann Saphir, *Fedcoin? The U.S. Central Bank is Looking into It*, REUTERS (Feb. 5, 2020), https://www.reuters.com/article/us-usa-fed-brainard/fedcoin-the-us-central-bank-is-looking-into-it-idUSKBN1ZZ2XF.

59. *See* Wolfie Zhao, *China's Crypto Competitor Is Being Built in a Secret Office with Restricted Access*, COINDESK (Sept. 4, 2020), https://www.coindesk.com/chinas-digital-currency-is-being-built-in-a-secret-office-with-restricted-access.

60. For a list of actively trading stablecoins, *see Stablecoin Coins*, CRYPTOSLATE, https://cryptoslate.com/cryptos/stablecoin/ (last visited July 19, 2020).

61. Other stablecoins include HUSD (HUSD), Multi-collateral DAI (DAI), Brazilian Digital Token (BRZ), USDx Stablecoin (USDX), NairaX (NIRX), USDCoin (USC), QUSD (QUSD), Binance GBP Stable Coin (BGBP) and SDUSD (SDUSD). *See id.*; *See also 2019 State of Stablecoin*, BLOCKCHAIN.COM (2019), https://www.blockchain.com/research; Eur. Cent. Bank [ECB], *Stablecoins – No Coins, but Are They Stable?*, *supra* note 18 (listing stablecoin initatives); Bullmann, *supra* note 18 (discussing the status of stablecoins at the end of 2019).

62. For a list of 310 stablecoin companies with classification and website, see *List of Stablecoins*, GOOGLE SHEET, https://docs.google.com/spreadsheets/d/18tkS0BqNgfVbrynAaXQRTj-ui8X5wj1-WOnWRZzEP7Q/edit [https://perma.cc/V62U-RWYP] (last visited Aug. 27, 2020).

63. Stablecoin market capitalisation grew from €1.3 billion in January 2018 to €4.3 billion in July 2019. Average stablecoin transaction volume between January and July 2019 was €13.5 billion per month. Total digital coin issuance peaked either market capitalisation of €650 billion in January 2018 which fell to €96 billion by January 2019. *See* Bullmann, *supra* note 18, at 31.

64. *2019 State of Stablecoin*, *supra* note 61, at 31.

65. Blockchain distinguishes stablecoins between Traditional Collateralised (Asset Backed, Fiat Backed (Single or multiple), and mixed Asset and Fiat Backed), Crypto Collateralised (Crypto Asset Backed or Crypto and Fiat Backed), and Algorithmic stablecoins (Seigniorage, Fee Backed, or Hybrid). Around fifty percent of stablecoins use the Ethereum (ETH). *Id.* at 9, 14.

66. Tokenised stablecoins are supported by funds (commercial bank balances, electronic money or central bank reserves) held with an issuer or custodian. *See* Bullmann, *supra* note 18, at 31.

67. Collateralised stablecoins are supported by other non-monetary assets or other digital or crypto-assets. The value of off-chain stablecoins are tied to other assets such as securities or commodities held by the issuer or a custodian. On-chain coins are supported by other digital assets held in a decentralised form. Eur. Cent. Bank [ECB], *Stablecoins – No Coins, but Are They Stable?*, *supra* note 18, at 3.

and algorithmic funds.[68] Of the fifty-four stablecoins identified, thirty are tokenized, one off-chain collateralized, twelve on-chain collateralized, and eleven algorithmic,[69] with the largest number of stablecoins issued in the United States, China, European Union, and United Kingdom.[70] Wholesale stablecoins are generally tokenized and will have a fixed exchange rate where they follow a depository receipt model.[71] Other "retail stablecoins" have a variable exchange rate.[72] Stablecoin models can be considered in terms of valuation, transfer, and interface.[73] Price stabilization may also be supported by other secondary mechanisms.[74] Collateralized stablecoins may take hybrid forms with stabilization mechanisms being adjusted to create morphic stablecoins.[75]

The first stablecoin was possibly BitUSD in 2014.[76] The most widely-integrated currency or fiat backed collateralized or tokenised stablecoin is Tether.[77] The earliest form of algorithmic stablecoin was NuBits.[78] Tether was originally set up as Realcoin in July 2014 and renamed Tether in

68. Algorithmic stablecoins or non-backed (seigniorage) stablecoins use algorithms to manage the supply and demand of the coin to attempt to stabilise the price. 3. Algorithmic stablecoins may be referred to as "fiat" or "seigniorage" as they are not supported by any other claim or asset. *See* Bilal Memon, *Guide to Stablecoin: Types of Stablecoins & its Importance*, MASTER THE CRYPTO, https://masterthecrypto.com/guide-to-stablecoin-types-of-stablecoins/ (last visited July 19, 2020).

69. *Id.* at 5.

70. *Id.* at 4 n.8.

71. G7 Working Group on Stablecoins, *supra* note 19, at 25.

72. *Id.*

73. Valuation depends on the nature of issuance, price stabilization, and redemption. This reflects governance, management, and technology. Transfer depends upon whether the underlying blockchain is open and without permission or closed and with permission. This depends on infrastructure, code protocol, and consensus mechanism. Customers may interface directly with the ledger, through resellers or other wallet or service providers. *See id.* at 25–27.

74. These include fees and penalty fees, secondary units, stacking, redemption limits, targeted rebates, reactive mining rewards, price bands and re-adjusted pegs, and "kill switches." Bullmann, *supra* note 18, at 29–30.

75. *Id.* at 31.

76. BitUSD was launched with a fixed U.S. dollar value by Daniel Larimer, Charles Hoskinson, and Stan Larimer on July 21, 2014 through the BitShares platform using Delegated Proof of Stake (DPoS). BitUSD was the currency used on the BitShares platform with BitShares being held as collateral. This was effectively replaced by Steem subsequently. *See* Jake Simmons, *What Is Bitshares – Just Another Project by Dan Larimer?*, CRYPTO NEWS FLASH (May 14, 2019), https://www.crypto-news-flash.com/what-is-bitshares-just-another-project-by-dan-larimer/.

77. TETHER, https://tether.to/ (last visited July 19, 2020).

78. NuBits was launched by Jordan Lee on September 23, 2014 following Peershares which used customised distributed autonomous organisations (DAOs) and corporations (DACs). NuBits is tied to the U.S. dollar and managed by a NuBits DAO. NuShares are created by stakeholders and held by custodians. *History of the Nu Network*, NUBITS, https://docs.nubits.com/history/ (last visited July 19, 2020). The value of NuBits collapsed between May-June 2016 and in March 2018. Reserve Research Team, *The End of a Stablecoin — The Case of NuBits*, MEDIUM (July 12, 2018), https://medium.com/reserve-currency/the-end-of-a-stablecoin-the-case-of-nubits-dd1f0fb427a9.

November 2014.[79] Tether has market capitalisation of around $4.65 billion. It represented ninety-nine percent of the stablecoin market in February 2018 with this falling to eighty-one percent by July 2019.[80] Tether was intended to be tied to the U.S. dollar (US Tether), the Euro (EuroTether), and the Japanese Yen (YenTether).[81] U.S. Tether uses the Bitcoin blockchain and the Omni protocol.[82] Tether was stated to be backed one-hundred percent by the U.S. dollar and is now backed by U.S. reserves.[83] On-chain stablecoins may be collateralised, for example by gold with Digix Gold Tokens (DGX).[84] On-chain stablecoins may be supported by other cryptocurrencies such as MakerDAO and Ether.[85]

The ECB has constructed a "cryptocube" for cryptoassets more generally based on the extent to which the asset is claim or not claim based against an issuer, responsibilities are centralised or decentralised, and valuation and stability.[86] Stablecoins may either be backed or collateralised by a fiat currency, a cryptocurrency, or commodity, or be un-backed and algorithm based. The ECB considers stablecoins in terms of tokenised (fiat backed), off and on-chain collateralised stablecoins, and algorithmic stablecoins.[87] The G7 has distinguished between stablecoins that represent a claim against an issuer or underlying funds or assets or against another right or interest and does not consider algorithmic stablecoins.[88]

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79. Pete Rizzo, *Realcoin Rebrands as 'Tether' to Avoid Altcoin Association*, COINDESK (Nov. 20, 2014), https://www.coindesk.com/realcoin-relaunches-tether-avoid-altcoin-association.

80. Bullmann, *supra* note 18, at 15.

81. TETHER, *supra* note 77.

82. Gareth Jenkinson, *Changes to Tether's Terms of Reserves Raises Fresh Concerns*, COIN TELEGRAPH (Mar. 24, 2019), https://cointelegraph.com/news/changes-to-tethers-terms-of-reserves-raises-fresh-concerns.

83. Tether was reported to have been set up and governed by the same individuals responsible for the Bitfinex digital currency exchange based in Hong Kong with an investigation being commenced against Bitfinex by New York Attorney General, Letitia James, in April 2019. It was alleged that Bitfinex had used Tether reserves to cover around $850 million in losses. A court order was obtained against the operator of the Bitfinex virtual asset trading platform, iFinex Inc, and Tether Ltd. Press Release, New York State Attorney General, Attorney General James Announces Court Order Against "Crypto" Currency Company Under Investigation for Fraud (Apr. 25, 2019), https://ag.ny.gov/press-release/2019/attorney-general-james-announces-court-order-against-crypto-currency-company.

84. Digix Gold Tokens (DGX) was set up in 2014 and are based on gold held with The Safe House custodian in Singapore. DGX is an Ethereum Request for Comment (ERC) 20 token and uses Proof of Provenance (PoP) to tie the value of the tokens to gold. *The Digix Ecosystem*, DIGIX, https://digix.global/#/ecosystem (last visited July 14, 2020).

85. The stablecoin DAI is backed by Ether using the MakerDAO smart contract protocol within the Dao stablecoin system operating on the Ethereum blockchain. This uses Collateralised Debt Positions (CDPs) to exchange digital assets for DAI. The Single Collateral DAI token only uses Ether with the Multi-collateral DAI using other collateral assets. *The Maker Protocol: MakerDAO's Multi-Collateral Dai (MCD) System*, MAKERDAO, https://makerdao.com/en/whitepaper/#abstract (last visited July 14, 2020).

86. Bullmann, *supra* note 18, 9–11.

87. *Id.*

88. *Id.*

II. Facebook, Libra Coin, and Libratech

The Libra coin was initially launched by Facebook on June 18, 2019 and then reissued on April 16, 2020 with a "Libra 2.0."[89] Libra was to operate as a stable coin with its value tied to a basket of currencies and government securities held as a Libra Reserve although the later revisions would allow for the creation of single currency digital coins backed by a specific asset such as US dollars or Euros or cash equivalents with a capital buffer.[90] Libra was to be managed through a Libra Association set up in Switzerland.[91] The association initially had twenty-eight members consisting of major payment, financial, telecommunications, venture capital companies, and non-government organisations (NGOs) with an intent to grow to 100 members.[92] Participation then fell even though Libra claimed to have a substantial waiting list.[93] Facebook provided a separate wallet service through a subsidiary company, Novi, formerly announced as Calibra.[94]

The Libra project was originally managed by David Marcus, former President of PayPal, who was transferred to the new blockchain division within Facebook in May 2018.[95] Marcus stated that the new coin would democratise access to money.[96] Facebook CEO Mark Zuckerberg had stated

89. *Facebook Unveils Global Digital Coin Called Libra*, FIN. TIMES (June 18, 2019), https://www.ft.com/content/af6b1d48-90cc-11e9-aea1-2b1d33ac3271. Facebook announced a downgrading of the Libra proposal for "Libra 2.0" with a revised launch date of end 2020 on Thursday April 16, 2020. Press Release, Michael Engle, Libra Ass'n, Libra Developers: The Path Forward, (Apr. 16, 2020), https://libra.org/en-US/blog/libra-developers-the-path-forward/. A revised White Paper was released in April 2020. Libra Ass'n Members, *Libra White Paper v2.0*, LIBRA, (April 2020), https://libra.org/en-US/white-paper/.

90. Josh Constine, *Facebook Announces Libra Cryptocurrency: All You Need to Know*, TECHCRUNCH (June 18, 2019), https://techcrunch.com/2019/06/18/facebook-libra/. Libra 2.0 may also support CBDC. Libra could still introduce a multi-coin currency based on a basket of currencies although this would become a digital composite of its other new single currency coins. *See* Murphy and Kaminska, *supra* note 89.

91. *See* Constine, *supra* note 90.

92. These consisted of Mastercard, PayPal, PayU, Stripe, Visa, Booking Holdings, eBay, Facebook, Farfetch, Lyft, Mercado Pago, Spotify, Uber, Iliad, Vodafone, Anchorage, Bison Trails, Coinbase, Xapo Holdings, Andreesson Horowitz, Breakthrough Initiatives, Ribbit Capital, Thrive Capital, Union Square Ventures, Creative Destruction Lab, Kiva, Mercy Corps, and Women's World Banking. *Id.*

93. Vodafone withdrew in January 2020 (following Booking Holdings, eBay, Mastercard, Mercado Pago, PayPal, Stripe, and Visa) with it reported that over 1,500 companies were interested in participating. Nikhilesh De, *Vodafone Is the Latest Big Company to Quit Facebook-Founded Libra Association*, COINDESK (Jan. 21, 2020), https://www.coindesk.com/vodafone-is-the-latest-big-company-to-quit-facebook-founded-libra-association. *See also* Kiran Stacey & Hannah Murphy, *Facebook Admits Digital Currency Doubts as Regulatory Hurdles Loom*, FIN. TIMES (Oct. 14, 2019), https://www.ft.com/content/be6a7756-eea2-11e9-ad1e-4367d8281195.

94. *See* Constine, *supra* note 90.

95. *See id.*

96. Shannon Bond, *David Marcus, the Man Leading Facebook's Charge into Financial Services*, FIN. TIMES (June 22, 2019), https://ft.com/content/248a5bf0-93d1-11e9-aea1-2b1d33ac3271 ("The Internet . . . has given everyone access to the world's information, and democratised access to free communications, but money has stayed the same.").

that he wanted Facebook to "go deeper and study the positive and negative aspects" of cryptocurrencies in February 2018.[97] Facebook also employed former Instagram vice president Kevin Weil.[98] Facebook had fifty engineers working on the project by February 2019.[99] Libra was similar to the Telegram Gram coin with the Telegram Open Network (TON) project developed by the Russian instant messaging service Telegram, set up by Pavel Durov.[100]

One of the stated objectives of Libra was to assist the 1.7 billion people without a bank account across the world who would be able to make instant, and almost free, international money transfers through their mobile telephones and other devices.[101] The international remittance market was worth $613 billion.[102] A know-your-customer (KYC) system would operate using government approved identification.[103] Libra has considered adopting a "tiered" system with less substantial controls required for low value transactions.[104] Facebook stated that it would separate its social media data and the new financial data created by the scheme.[105] A number of core policy and technical documents are available on the Libra website.[106]

The new currency can be considered as part of a shift in business strategy by Facebook to limit its dependence on advertising revenue for its social

97. Shannon Liao, *Facebook Is Creating a Mysterious Blockchain Division*, VERGE (May 8, 2018), https://www.theverge.com/2018/5/8/17332894/facebook-blockchain-group-employee-reshuffle-restructure-david-marcus-kevin-weil.

98. *Id.*

99. Nathaniel Popper & Mike Isaac, *Facebook and Telegram Are Hoping to Succeed Where Bitcoin Failed*, N.Y. TIMES (Feb. 28, 2019), https://www.nytimes.com/2019/02/28/technology/cryptocurrency-facebook-telegram.html.

100. Telegram indicated that it would not integrate a digital wallet into its messaging app until it had received regulatory approval. Anna Baydakova, *Telegram Tries to 'Clarify' Gram Crypto Project Amid Ongoing SEC Fight*, COINDESK (Jan. 6, 2020), https://www.coindesk.com/telegram-tries-to-clarify-gram-crypto-project-amid-ongoing-sec-fight. Telegram had raised from accredited investors $1.7 billion in two ICOs in February and March 2018 with a limited public offer in July 2019. Daniel Palmer, *Messaging Giant Telegram's ICO Token Is at Last Going on (Limited) Public Sale*, COINDESK (June 11, 2019), https://www.coindesk.com/messaging-giant-telegrams-ico-token-is-at-last-going-on-public-sale.

101. One billion people had access to a mobile telephone and half a billion had internet access. Libra Ass'n Members, *supra* 89, at 1.

102. Toby Shapshak, *Global Remittances Reach $613 Billion Says World Bank*, FORBES (May 21, 2018), https://www.forbes.com/sites/tobyshapshak/2018/05/21/global-remittances-reach-613bn-says-world-bank/#44c3050b5ddc.

103. *See generally* Eli Talmor, *On Libra, Regulation and Financial - Crime Prevention*, FINEXTRA (Aug. 2, 2019), https://www.finextra.com/blogposting/17700/on-libra—regulation-and-financial—crime-prevention.

104. Ian Allison, *How Anti-Money-Laundering Rules Hinder Libra's Mission to Reach the Unbanked*, COINDESK (Oct. 9, 2019), https://www.coindesk.com/how-anti-money-laundering-rules-hinder-libras-mission-to-reach-the-unbanked.

105. Constine, *supra* note 90.

106. *See* LIBRA, *supra* note 54.

media sites.[107] Facebook attempted to create an earlier payment system with "Facebook Credits" in May 2009 which would have allowed users to purchase gaming and non-gaming products on a ten credit per one U.S. dollar exchange basis.[108] Facebook set up a subsidiary, Facebook Payments Inc. in March 2011; however, the credit system was abandoned in 2012.[109] Digital payment could become a natural extension of Facebook's move into ecommerce with increased business-to-customer interaction[110] and act as a substantial source of new income.[111] Facebook may also be considered to be following the market lead set by China businesses such as AliPay and WeChat with their "SuperApps."[112]

A. LIBRA

Libra was intended to be simple, inclusive, and global.[113] Libra's stated mission was to create a global currency and financial infrastructure that could empower billions of people.[114] Libra would provide a new decentralised blockchain, low volatility cryptocurrency, and a smart contract platform.[115] Libra would harness the unique properties of blockchains and cryptocurrencies with distributed governance, open access, and cryptographic security; however, difficulties remained with volatility and scalability.[116] Libra attempted to produce a new collaborative and innovative product with a sustainable, secure, and trusted framework to support the creation of a low cost, accessible, and connected global financial system in cooperation with regulators and experts.[117] Six other opportunity objectives were referred to in the Libra White Paper.[118]

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107. Annual revenue growth had fallen from fifty-four percent in 2016 to thirty-seven percent in 2017 with developed country markets being close to saturation. Constine, *supra* note 90.

108. John Oates, *How Will Sir Pay? Facebook Credits, That'll Do Nicely*, REGISTER (June 3, 2009), https://www.theregister.com/2009/06/03/facebook_payments/.

109. *Facebook Scraps its Own Credits Currency for Apps*, BBC NEWS (June 20, 2012), https://www.bbc.com/news/technology-18519921.

110. Hannah Murphy & Philip Stafford, *Why Facebook Wants to Launch its Own Currency*, FIN. TIMES (May 23, 2019), https://www.ft.com/content/e23a2f32-7d73-11e9-81d2-f785092ab560.

111. Ross Sandler of Barclays estimated that the new currency could generate between $3 billion and $19 billion additional revenue by 2021. Zack Seward, *'Facebook Coin' Could Generate Billions in Revenue: Barclays Analyst*, COINDESK (Mar. 11, 2019), https://www.coindesk.com/facebook-coin-could-generate-billions-in-revenue-barclays-analyst.

112. *See* Murphy & Stafford, *supra* note 110.

113. *The Libra Project Is for the World*, LIBRA, https://libra.org/en-us/vision/ (last visited July 17, 2020).

114. Libra Ass'n Members, *supra* note 89, at 2–3.

115. *Id.*

116. *Id.*

117. *Id.*

118. (1) People had access to financial services and cheap capital; (2) people had an inherent right to control their legal labour; (3) the global, open, instant and low cost movement of money would create economic opportunity and increase commerce; (4) people will increasingly trust centralised forms of governance; (5) global currency and financial infrastructure should be designed and governed as a public good; and (6) everyone had a responsibility to assist advance

The currency unit is referred to as the Libra which is based on a Libra Blockchain.[119] Libra would use an open source prototype implementation, referred to as the Libra Core, with the Libra Protocol being published in a separate technical document called "The Libra Blockchain."[120] The Libra Blockchain was described as a cryptographically authenticated database maintained using the Libra Protocol with the members of the Libra Association acting as validators or replicas.[121] The protocol includes a number of other organisational components.[122] The code is written in Rust[123] with the new programming language referred to as "Move."[124]

The blockchain would record transactions and appear to operate on an account system rather than a transaction basis with the protocol maintaining a "ledger state"—to record transactions, to record ledger history, and to respond to client queries.[125] The blockchain state can only be altered through transaction executions with Libra using a form of "gas" coin similar to Ethereum.[126] A new version of the authenticated data structure would be created by validators after each transaction execution.[127] Libra would maintain a single Merkle tree rather than separate block trees.[128] Accounts would operate as collections of resources and modules stored under each account address.[129] Libra would use a version of the HotStuff consensus protocol called Libra Byzantine Fault Tolerant (LibraBFT).[130]

Libra would initially operate on a permissioned, rather than permissionless basis, to control access by new validators and the creation of new validator nodes.[131] It was accepted that permissionless models had not been able to provide the scalability, stability, and security expected—despite this, the Libra Association would work to secure a transition from a

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financial inclusion, support ethical actors and continuously uphold the integrity of the ecosystem. *Id.*

119. Zachary Amsden et al., *The Libra Blockchain*, LIBRA ASS'N 1 (July 23, 2019), https://developers.libra.org/docs/assets/papers/the-libra-blockchain/2020-05-26.pdf.

120. *Id.* at 25–26.

121. *Id.* at 3.

122. These included a Logical Data Model (Section 2), Transaction Execution (Section 3), Data Structure and Storage Authentication (Section 4), Byzantine Fault Tolerant Consensus (Section 5) and Networking (Section 6). *Id.* at 4, 7, 12, 17, 19.

123. RUST, https://www.rust-lang.org (last visited July 17, 2020); *see also infra* Section VI.K.

124. Sam Blackshear et al., *Move: A Language with Programmable Resources*, LIBRA ASS'N 20 (May 1, 2020), https://developers.libra.org/docs/assets/papers/libra-move-a-language-with-programmable-resources/2020-05-26.pdf.

125. Amsden et al., *supra* note 119, at 4.

126. *Id.* at 8.

127. *Id.*

128. *Id.* at 14.

129. *Id.*

130. *Id.* at 17.

131. *Id.* at 24.

permissioned to a permissionless state by 2025.[132] Facebook has made the Libra testnet available on an open source basis.[133]

B. Libra Association

The Libra Association was set up as an independent, not-for-profit membership organisation based in Geneva, Switzerland.[134] The Libra Association had twenty-eight "Founding Members"[135] with this intended to increase to 100 participants by the Libra launch date.[136] Members had to either: have a market value of $1 billion, hold more than $500 million in customer balances, have more than 20 million customers in a year, or be recognized as a top 100 industry company such as on the Fortune 500. While Facebook was expected to maintain a leadership role until 2019, Facebook and its affiliates would then only have the same commitments, privileges, and financial obligations as other Founding Members.[137] Switzerland was selected as it had a history of global neutrality and openness to blockchain technology.[138] The Association's role was stated to be to coordinate the development and stability of the network through the validator nodes and to promote a joint vision of financial inclusion with technical and financial coordination.[139]

The association would be directed by a Libra Association Council.[140] Libra members would contribute, at a minimum, $10 million to the network through the purchasing of Libra Investment Tokens (LITs).[141] Each member of the Council would only have one vote.[142] A separate Libra Association Board (LAB) would be established as an oversight body to provide operational guidance to the Association's executive team.[143] The work of The Association would be supported by a five to seven member Libra Social Impact Advisory Board (SIAB)[144] led by social impact partners (SIPs) including non-profit and multilateral organisations and academic

132. *The Four Keys to the Success off Facebook's Libra*, Blockchain Built https://www.blockchainbuilt.io/the-four-keys-to-the-success-of-facebooks-libra/ (last visited July 19, 2020).

133. *See Try Libra*, Libra Ass'n, https://developers.libra.org (last visited July 18, 2020).

134. *The Libra Association*, Libra, https://libra.org/en-US/association/ (last visited July 18, 2020).

135. *See id.*

136. Libra Ass'n Members, *supra* note 89, at 4.

137. *Id.*

138. *Id.* at 8.

139. *Id.* (The association would also at an early stage recruit validator nodes, raise funds, design and implement incentive programmes and distribute dividends.).

140. *Id.* at 8.

141. Constine, *supra* note 90.

142. *Libra: Cryptocurrency by Facebook (Definitive Guide 2019)*, ILFA (Oct. 23, 2019), https://www.ilfa.africa/libra-cryptocurrency-by-facebook-definitive-guide-2019/.

143. *Id.*

144. Libra Ass'n Members, *supra* note 89, at 11.

institutions.[145] The SIAB would develop a long term strategic agenda and recommend the allocation of grants and social impact. The Association would have an executive team led by a Managing Director and other key staff.[146]

The Libra Association would be responsible for the minting (creation) and destruction (burning) of coins. Coins would only be minted on the purchase of coins by authorised resellers using official fiat currency which would be held in the Libra Reserve. Coins would be destroyed on the re-sale of Libra to the Association. The Libra Reserve would act as a buyer of last resort (BLR).[147] The Association would also be responsible for the development of the open identity standard and for moving towards decentralisation over time.[148] Facebook was reported to have intended to raise $1 billion to support its new currency.[149] Facebook had $44 billion in cash and equivalent assets in the same amount during April 2018.[150]

C. Novi

Novi (formerly announced as Calibra)[151] was set up as a Facebook subsidiary to provide financial services to people participating in the Libra network. The first product would be the digital wallet provided either through Facebook Messenger and WhatsApp or on a standalone basis. It was initially expected that this would be available from 2020.[152] Novi allows users to send Libra to anyone with a smartphone in the same way that they send text messages at low to zero cost. Quick Response (QR) codes and other bill paying facilities would be made available, and high levels of security would be provided. Financial data would only be exchanged with Facebook or any other company with customer consent. Facebook stated that data would only otherwise be exchanged in the interests of safety, legal compliance or to support functionality.[153] Facebook published a separate statement on this subsidiary's data privacy.[154]

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145. *Id.*

146. Deputy managing director and chief operating officer (COO), chief financial officer (CFO), head of product, head of business development, head economist, head of policy, head of compliance and financial intelligence and general counsel. *Id.*

147. *Id.*

148. *Id.* at 9.

149. Yogita Khatri, *Facebook Said to Be Seeking $1 Billion in Funding for Crypto Project*, CoinDesk (Apr. 9, 2019, 9:00 AM), https://www.coindesk.com/facebook-said-to-be-seeking-1-billion-in-funding-for-crypto-project.

150. *Id.*

151. *Coming in 2020: Calibra*, Facebook (June 18. 2019, 2:00 PM) https://about.fb.com/news/2019/06/coming-in-2020-calibra/.

152. David Marcus, *Welcome to Novi*, Facebook (May 26, 2020), https://about.fb.com/news/2020/05/welcome-to-novi/.

153. *Id.*

154. *See Calibra: Customer Commitment*, Elec. Frontier Found. (July 10, 2019) https://www.eff.org/files/2019/07/10/calibra-customer-commitment.pdf.

D. Libra Reserve and Exchanges

Libra was initially to be set up as a stable coin supported by a reserve of currency assets, referred to as the Libra Reserve, although it was subsequently confirmed that Libra may allow single currency digital coins and also support CBDC.[155] This would be facilitated by a network of competitive exchanges that would buy and sell Libra. Libra may or may not be pegged to a specific currency with its value fluctuating with its asset base, although the originally unspecified currency assets would be selected to minimise volatility.[156] The reserves would be held by a geographically distributed network of custodians described as having investment grade credit rating to provide security and to hold the assets on a decentralised basis.[157] This was claimed to provide the currency with intrinsic value.[158] Interest generated on the reserve assets would be used to cover systems costs, maintain low transaction fees, pay dividends to investors making up the Libra Association and to support future growth and adoption.[159]

E. Regulatory Reaction

A number of critical comments have been made following the launch of Libra and with other concerns expressed. Some commentators have questioned Facebook's performance and reliability in maintaining personal data standards, although they welcomed the disruption and possible reform to the banking system which was described as being long overdue.[160] It was expected that Facebook would face "unprecedented regulatory scrutiny" and have to face a "regulatory gauntlet."[161] Other observers have stated that regulators should act with caution in dealing with the significance, promise and risks of the Libra development.[162]

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155. *See Economics and the Libra Reserve*, Libra (Apr. 2020), https://libra.org/en-US/economics-and-the-reserve/#overview.5. *See also* Murphy and Kaminska, *supra* note 89.

156. *Id.* at 3.

157. *See id.*

158. *Id.*

159. *Id.*

160. *Facebook's Libra Coin Is a Symptom of Banks' Flaws*, Fin. Times (June 18, 2019), https://www.ft.com/content/fb3d7c68-910b-11e9-aea1-2b1d33ac3271. On Facebook influence, *see* Hannah Murphy & Kiran Stacey, *Where It All Went Wrong for Facebook's Libra*, Fin. Times (Oct. 15, 2019), https://www.ft.com/content/6e29a1f0-ef1e-11e9-ad1e-4367d8281195.

161. Anna Irrera, *Facebook's Libra Coin Likely to Run a Regulatory Gauntlet*, Reuters (June 28, 2019, 4:05 PM), https://www.reuters.com/article/us-facebook-crypto-regulation/facebooks-libra-coin-likely-to-run-a-regulatory-gauntlet-idUSKCN1TT30A. *See also* Chris Giles, et al., *Global Regulators Put Pressure on Libra with Enhanced Scrutiny*, Fin. Times (Oct. 13, 2019), https://www.ft.com/content/cbe4dc0c-edba-11e9-bfa4-b25f11f42901.

162. Martin Wolf, *Facebook Enters Dangerous Waters with Libra Cryptocurrency*, Fin. Times (June 25, 2019), https://www.ft.com/content/07c05fba-b1c4-11e7-a398-73d59db9e399 (Facebook has been described as being "grossly irresponsible over its impact on our democracies . . . [and] cannot obviously be trusted with our payment systems.").

The Group of Seven (G7) nations announced that they would establish a high level Working Group on Stablecoins under Benoît Cœuré, Chairman of the CPMI, in cooperation with central banks and the IMF to examine the risks of digital currencies and specifically stable coins to the financial system.[163] The working group produced an update in July 2019 which identified five public policy priorities in terms of ensuring public trust, a sound legal basis, effective governance and risk management, stable value management, and avoidance of wider international monetary system disruption.[164] The group would engage with developers and the public and work with G7 finance ministries, standard setting bodies, the G20, and FSB.[165] A conference was hosted by the BIS on stablecoins[166] in September 2019 with presentations made by Fnality International,[167] the Libra Association,[168] and JP Morgan.[169] Benoît Cœuré had published an earlier paper on retail payment and the limits of Bitcoin.[170]

The G7 published a major report on global stablecoins with the IMF and CPMI on October 2019.[171] The G7 examined stablecoins that represented a claim on an issuer or underlying asset or fund or a claim on another right or

163. Caroline Binham, et al., *Facebook's Libra Currency Draws Instant Response from Regulators*, FIN. TIMES (June 18, 2019), https://www.ft.com/content/5535fb3a-91ea-11e9-b7ea-60e35ef678d2.

164. Benoît Cœuré, Chair of the CPMI and Member of the Executive Board of the ECB, Speech to the G7 Finance Ministers and Central Bank Governors Meeting (July 18, 2019) *in Update from the Chair of the G7 Working Group on Stablecoins*, BIS (July 18, 2019), https://www.bis.org/cpmi/speeches/sp190718.pdf.

165. *Id.*

166. Press Release, Senior Officials from Public Authorities Meet on Stablecoins (Sept.16, 2019), https://www.bis.org/press/p190916.htm#:~:text=senior%20officials%20from%20public%20authorities%20worldwide%20met%20in%20Basel%20on,institutions%20and%20large%20technology%20companies.

167. Fnality International is supported by a consortium of major international financial institutions to create a network of decentralised Financial Market Infrastructures (dFMIs) to provide payment-on-chain in wholesale banking markets. FNALITY INT'L, https://www.fnality.org (last visited Aug. 7, 2020).

168. *See* THE LIBRA ASS'N, https://libra.org (last visited July 22, 2020).

169. *J.P. Morgan Creates Digital Coin for Payments*, J.P MORGAN (Feb. 14, 2019), https://www.jpmorgan.com/global/news/digital-coin-payments. (JP Morgan has launched JPM Coin to make instantaneous U.S. dollar equivalent payments using blockchain technology. Clients purchased digital JPM Coins which are transferred on a distributed ledger and then re-exchanged for U.S. dollars.).

170. CPMI & Markets Committee, *Central Bank Digital Currencies*, BANK FOR INT'L SETTLEMENTS [BIS], 4–6 (Mar. 2018), https://www.bis.org/cpmi/publ/d174.htm (describing similar information as outlined in the earlier paper in advance of this joint report and using a "money flower" taxonomy of money which contrasted central bank, digital, and token based monetary instruments). *See also* Benoît Cœuré & Jacqueline Loh, *Bitcoin Not the Answer to a Cashless Society*, EUR. CENT. BANK, (Mar. 13, 2018), https://www.ecb.europa.eu/press/inter/date/2018/html/ecb.in180313.en.html (outlining nonclarity of whether CBDC was necessary or desirable for consumer and business payments).

171. *See* G7 Working Group on Stablecoins, *supra* note 19.

interest rather than algorithmic stablecoins.[172] This acknowledged limitations in existing cross-border payment systems which were slow, expensive, and opaque, especially in relation to retail remittances with 1.7 billion people globally remaining unbanked or underbanked.[173] While global stablecoins may bring technological advances, they were only one solution and were largely untested.[174]

The Financial Stability Board (FSB) under its Chairman Randal K. Quarles, U.S. Federal Reserve Governor and Vice Chairman for Supervision, issued a Regulatory Note on Stablecoins in October 2019.[175] This followed the G20 Leaders' Osaka Declaration call in June 2019 for further study of the existing and emerging risks that arose with crypto-assets.[176] The FSB noted the potential advantages of stablecoins with the need to contain relevant risks through adequate and comprehensive regulatory and oversight arrangements.[177] The FSB would review and assess the adequacy of existing supervisory and regulatory approaches and emerging practices and advise on the possible adoption of new multilateral responses to deal with any relevant financial stability or systemic risk concerns.[178]

Randal Quarles, had stated before the G20 meeting in Japan, that the "wider use of new types of crypto assets for retail payment purposes would warrant close scrutiny by authorities to ensure that they are subject to high standards of regulation."[179] Randal Quarles had confirmed that the wider use of crypto-assets for retail payment purposes would require authorities to ensure that they were subject to high standards of regulation.[180] Facebook had met with the FSB's Financial Innovation Network although only to discuss more general matters.[181] The BIS had confirmed separately that authorities would have to develop a coordinated response to the new risks that may arise from technology companies moving into finance (TechFin).[182]

It was reported that Facebook had already commenced discussions with relevant regulatory authorities including with the Commodity Futures

172. *Id.* at 1.

173. *Id.* at 3.

174. *Id.* at ii.

175. *Regulatory Issues of Stablecoins, supra* note 18.

176. *G20 Osaka Leaders' Declaration*, MINISTRY OF FOREIGN AFFS. OF JAPAN, (June 29, 2019), https://www.mofa.go.jp/policy/economy/g20_summit/osaka19/en/documents/final_g20_osaka_leaders_declaration.html#:~:text=WE%2C%20the %20Leaders%20of%20the,for%20the%20benefit%20of%20all.

177. *Id.* at 3.

178. *Regulatory Issues of Stablecoins, supra* note 18.

179. Wolf, *supra* note 162.

180. Huw Jones, *Facebook's Libra Coin Closely Watched by Authorities*, REUTERS (June 25, 2019), reuters.com/article/us-g20-fsb/facebooks-libra-coin-closely-watched-by-authorities-fsb-id USKCN1TQ1Z5#:~:text=&The%20FSB%20and%20standard%20setting,Reserve%20Vice %20Chair%20for%20Supervision.

181. *Id.*

182. *See* discussion *infra* Section I. *See also* sources cited *supra* note 26.

Trading Commission (CFTC) in the United States.[183] It was confirmed that Novi would be regulated and was in the process of applying for a money transmitter licence.[184] Facebook had had a "courtesy meeting" with the BIS before its project announcement in June 2019.[185]

Bank of England Governor, Mark Carney, stated before a central bank meeting in Portugal that the Bank would consider Facebook's ambitions "with an open mind" but not "an open door."[186] Mark Carney subsequently confirmed that "the terms of engagement for any new systemic private payments system must be in place well before any launch."[187] Mark Carney indicated that a new Synthetic Hegemonic Currency (SHC) may be better provided by the public sector such as through a network of central bank digital currencies based on a basket of underlying currencies.[188] This could limit the destabilising effects of the international financial systems' reliance on the U.S. dollar as reserve currency. French finance minister, Bruno Le Maire, has opined that Libra must not be allowed to become a sovereign currency.[189]

The U.S. Senate Banking Committee announced a hearing on Libra the day after its launch with the House Financial Services Committee calling for a moratorium on its development.[190] It was reported that the Senate Banking Committee examined Libra on May 9, 2019 with an open letter

183. Hannah Murphy, *What Is Libra, Facebook's New Digital Coin?*, FIN. TIMES (June 18, 2019), https://www.ft.com/content/c3746b5c-90de-11e9-aea1-2b1d33ac3271.

184. *Id.*

185. Huw Jones & Tom Wilson, *Politicians Need to Move Fast as Facebook Was Successful in Attracting New Users*, REUTERS (June 23, 2019), https://www.reuters.com/article/us-bis-tech-regulations/politicians-need-to-move-fast-as-facebook-co-move-into-finance-bis-idUSKCN1TO0OH.

186. Roger Baird, *Bank of England Welcomes Facebook's Libra with 'Open Mind, Not Open Door'*, ALTFI, (June 21, 2019), https://www.altfi.com/article/5467_bank-of-england-welcomes-facebooks-libra-with-open-mind-not-open-door (stating that that if Facebook was successful in attracting new users "it would instantly become systemic and will have to be subject to the highest standards of regulation.").

187. Mark Carney, Former Governor, Bank of England from 2013 to 2020, Speech at Jackson Hole Symposium (Aug. 23, 2019) *in The Growing Challenges for Monetary Policy in the Current International Monetary and Financial System*, BANK OF ENG. (Aug. 23, 2019), https://www.bankofengland.co.uk/speech/2019/mark-carney-speech-at-jackson-hole-economic-symposium-wyoming (highlighting challenges and anachronisms for monetary policy in the current international monetary and financial system. Policy implications were assessed in the short, medium and long term to create a more multipolar international monetary and financial system.).

188. *Id.* at 15.

189. Kyle Torpey, *How Will Facebook's Libra Cryptocurrency Affect Bitcoin Price?*, FORBES (June 19, 2019), https://www.forbes.com/sites/ktorpey/2019/06/19/how-will-facebooks-libra-cryptocurrency-affect-the-bitcoin-price/#64f941a3155f.

190. Press Release, Maxine Waters et al., Committee Democrats Call on Facebook to Halt Cryptocurrency Plans (July 2, 2019), https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=404009. (requesting that "Facebook and its partners immediately agree to a moratorium on any movement forward on Libra").

being sent to Facebook by Chairman Michael Crapo and ranking member Sherrod Brown.[191]

Treasury Secretary, Steven Mnuchin, stated that Libra "could be misused by money launderers and terrorist financiers" and that it therefore was a "national security issue."[192] Bitcoin and other cryptocurrencies had been "exploited to support billions of dollars of illicit activity like cybercrime, tax evasion, extortion, ransomware, illicit drugs, and human trafficking" and that he was "not comfortable today" with the launch of Libra.[193] U.S. Federal Reserve Chairman, Jerome Powell, considered that the Libra project could not "go forward" until "serious concerns" had been resolved including with regard to privacy, money laundering, consumer protection and financial stability.[194] The value of Bitcoin fell sharply following the warnings.[195] President Donald Trump had stated that cryptocurrencies were "unregulated crypto assets" based on "thin air."[196]

The U.S. Federal Reserve Board warned that stablecoins could create havoc in the global economy in the event on a run on the coin issuer with coin holders panicking and demanding return of staked assets.[197] Federal Reserve Board member, Lael Brainard, warned of the challenges of stablecoins and of the implications of CBDC introduction.[198] Lael Brainard referred to other payment innovations including the new consumer and business 24/7 FedNow payment service with the Federal Reserve continuing to monitor the benefits and costs of CBDC and initiatives in other

191. Press Release, Mike Crapo & Sherrod Brown, Crapo, Brown Request Information for Facebook on Data Collection, (May 10, 2019), https://www.banking.senate.gov/newsroom/majority/crapo-brown-request-information-from-facebook-on-data-collection.

192. Kate Rooney, *Mnuchin: US Has 'Very Serious Concerns' that Facebook's Libra Could be Misused by Terrorists*, CNBC (July 15, 2019), https://www.cnbc.com/2019/07/15/treasury-secretary-mnuchin-will-hold-a-news-conference-on-cryptocurrencies-at-2-pm-et.html.

193. *Id.*

194. Billy Bambrough, *Blow to Bitcoin as Fed Chair Jerome Powell Issues Stark Facebook Warning*, FORBES (July 11, 2019), https://www.forbes.com/sites/billybambrough/2019/07/11/blow-to-bitcoin-as-fed-chair-jerome-powell-issues-stark-facebook-warning/#7535c30f3eaf.

195. *Id.* (stating Bitcoin had recovered 250 percent of its earlier value during the first half of 2019 and lost ten percent following the Federal Reserve announcement. Around twenty-six percent of total Bitcoin activity was conducted in the United States.).

196. Billy Bambrough, *Donald Trump Just Made Bitcoin a 2020 Election Issue*, FORBES (July 13, 2019), https://www.forbes.com/sites/billybambrough/2019/07/13/donald-trump-just-made-bitcoin-a-2020-election-issue/#5c999ae72db2.

197. Danny Nelson, *Stablecoin Crisis Could Wreck Global Finance, Fed Warns in New Report*, COINDESK (Nov. 15, 2019), https://www.coindesk.com/stablecoin-crisis-could-wreck-global-finance-fed-warns-in-new-report.

198. Lael Brainard, Speech at The Future of Money in the Digital Age, (Oct. 16, 2019), *in Digital Currencies, Stablecoins, and the Evolving Payments Landscape*, BD. OF GOVERNORS OF FED. RSRV. SYS., 2-3 (Oct. 16, 2019), https://www.federalreserve.gov/newsevents/speech/brainard20191016a.htm. *See also* Lael Brainard, Speech at Monetary Policy: The Challenges Ahead (Dec. 18, 2019), *in Update on Digital Currencies, Stablecoins, and the Challenges Ahead*, BD. OF GOVERNORS OF FED. RSRV. SYS. (Dec. 18, 2019), https://www.federalreserve.gov/newsevents/speech/brainard20191218a.htm.

countries.[199] A Bill was presented by Sylvia R. Garcia in November 2019 to bring stablecoins within U.S. regulation by classifying "managed stablecoins" as securities for the purposes of the Securities Act 1933 and Securities Exchange Act 1934.[200]

ECB President, Mario Draghi, warned that cryptocurrencies were "shaking the system" and would have to be reconsidered.[201] The European Commission confirmed that it would investigate Libra from a competition perspective with questionnaires being sent out to collect preliminary information.[202] A Joint Statement by the Council of the European Union and Commission on Stablecoins was published in November 2019 which stated that no global stablecoin should be allowed to operate within the European Union until all relevant legal, regulatory, and oversight challenges and risks had been adequately identified and addressed.[203]

Facebook warned investors that Libra may never be formally released due to regulatory concern.[204] Facebook stated that while it intended to launch Libra in 2020, a number of factors could prevent this including "pushback" from lawmakers and regulators.[205] Jorn Lambert of Mastercard had earlier stated that the Libra project may not launch if it received too much "pushback" from regulators.[206] "Market acceptance of [the] currency was also subject to significant uncertainty."[207] There was therefore no assurance that Libra and the associated products and services could be made available in a timely manner.[208] Facebook did not have significant "prior experience with digital currency or blockchain technology, which may adversely affect [its] ability to successfully develop and market [the new] products and services" proposed.[209]

Ueli Maurer, Switzerland's Finance Minister and outgoing President, stated in December 2019 that he did not think that the Libra project could continue in its existing form and had to be reworked to obtain approval

199. *Id.*

200. Managed Stablecoins are Securities Act of 2019, H.R. 5197, 116th Congress § 3(a) (2019) (defining "managed stablecoin" and "digital asset").

201. *Id. See also* Billy Bambrough, *Is This the Biggest Threat to Bitcoin, Crypto, and Facebook's Libra?*, FORBES (Sept. 14, 2019), https://www.forbes.com/sites/billybambrough/2019/09/14/the-real-threat-to-bitcoin-crypto-and-facebooks-libra/#4cc5aee24f0d.

202. Madhumita Murgia et al., *Facebook Cryptocurrency Investigated by EU*, FIN. TIMES, (Aug. 22, 2019), https://www.ft.com/content/02fe16e6-c402-11e9-a8e9-296ca66511c9.

203. Presidency Conclusions, Any Other Business: Stablecoins- Information from the Presidency, (Nov. 6, 2019), 13571/19 (Annex.) 2.

204. Salvador Rodriguez, *Facebook Warns Investors that Libra Digital May Never See the Light of Day*, CNBC, (July 29, 2019), https://www.cnbc.com/2019/07/29/facebook-warns-investors-that-libra-may-never-see-the-light-of-day.html.

205. *Id.*

206. Kyle Torpey, *How Will Facebook's Libra Cryptocurrency Affect the Bitcoin Price?*, FORBES (June 19, 2019), https://www.forbes.com/sites/ktorpey/2019/06/19/how-will-facebooks-libra-cryptocurrency-affect-the-bitcoin-price/#54b17a24155f.

207. Rodriguez, *supra* note 204.

208. *Id.*

209. *Id.*

especially in light of the basket of currencies underpinning it.[210] It was later confirmed that the Swiss authorities remained open to Libra's possible approval.[211]

Separate issues arise with regard to the originality of the Libra product design with parties claiming that the Libra White Paper has copied parts of other coin proposals as set out in other academic work.[212]

III. Libratech Advantage

Libra attempts to draw together all of the principal advantages of distributed ledger and blockchain technology and to realise these together in a single system based on a model. Markets have generally undergone substantial change in terms of digitalisation, dematerialisation, disintermediation, privatisation or virtualisation of products and services, and with the deconstruction or break-down of financial risk for separate management purposes, and with the general monetisation of assets and opportunities. Clients and customers have also benefited from the mobilisation, personalisation, datalisation, socialisation, and democratisation of products and services.[213]

A series of technology, business model, consumer, user and stakeholder, market, governance and regulation, infrastructure, central banking and monetary policy, and financial stability advantages can be identified.[214] The principal benefits that arise are concerned with speed and capacity, low latency (delay), cost and efficiency, flexibility and confidentiality, security with improved accessibility, separability and solidity, durability and immutability, consistency and transparency, scalability and expansion, control and confidence, interoperability, innovation, and evolution and stability.[215] These can be restated in terms of decentralisation with disintermediation, digitalisation, data control, authentication, automation,

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210. *Facebook's Libra Has Failed in Current Form: Swiss President*, REUTERS, (Dec. 27, 2019), https://www.reuters.com/article/us-facebook-cryptocurrency/facebooks-libra-has-failed-in-current-form-swiss-president-idUSKBN1YV1G8.

211. Paddy Baker, *Switzerland Softens Tone on Libra After Ex-President Says Project Failed*, COINDESK (Jan. 21, 2020), https://www.coindesk.com/switzerland-softens-tone-on-libra-after-ex-president-says-project-failed.

212. A money services business consists of 'any person doing business, whether or not on a regular basis or as an organised business concern, in one of more of the following capacities: (1) currency dealer or exchanger; (2) check casher; (3) issuer of traveller's checks, money orders or stored value; (4) seller or redeemer of traveller's checks, money orders or stored value; (5) money transmitter; or (6) U.S. Postal Service.' Ian Alison, *MIT Fellow Says Facebook 'Lifted' His Ideas for Libra Cryptocurrency*, COINDESK, (July 26, 2019), https://www.coindesk.com/mit-fellow-accuses-facebook-of-lifting-his-ideas-for-libra-cryptocurrency.

213. *See generally*, G.A. Walker, *Financial Technology Law: A New Beginning a New Future*, 50:1 INT'L LAW. 137 (2017).

214. *Id.*

215. Melinda Andoni et al., *Blockchain Technology in the Energy Sector: A Systematic Review of Challenges and Opportunities*, SCI. DIRECT (2018), https://www.sciencedirect.com/science/article/pii/S1364032118307184.

replication, reconciliation, modularisation, personalisation, interlinkage, codification and shared function, shared responsibility, and shared liability.

Business models also more specifically benefit from increased market opportunity, access, funding, mentoring and support, incubation and acceleration, regulatory support such as through the UK Project Innovate, open access and technical linkage, technical support, market expansion and growth, product development and innovation, increased earnings and reinvestment and product disposal, acquisition, and market exit. Other benefits can be identified.[216]

The G7 accepts that it may be faster, cheaper, and more inclusive than existing global payment systems and be useable for payment and store of value purposes.[217] These could extend access and inclusion and create efficiencies in cross-border retail payment.[218] It was expected that technology's impact on banking and financial services may be more significant in the area of payment.[219]

Substantial financial and wider social benefits could arise through continued technological advance and innovation in other areas. This includes further advances in mobile, shared, cloud, super and quantum computing, telecommunications, blockchain and graph technology, internet and world wide web reform, automation and smart contracts, biotech and cryptography, synthetic biology, nanotechnology, big data analytics, robotics, machine reading, machine learning and machine sentience, and general artificial intelligence (AI).[220] This can be collectively referred to as NewTech or FutureTech.

IV. Libratech Disadvantage

A corresponding series of limitations or constraints also have to be taken into consideration. These can again be considered in terms of technology, business models, users and stakeholders, markets, regulation and control, infrastructure, central banking and monetary policy, and wider financial stability issues. Particular technological difficulties arise in terms of limited relative speed and latency or technical inefficiency,[221] relative size and capacity high data and other costs and fees, access obstacles, opaqueness, lack of integrity, limited consensus, inefficiency and waste, lack of personal

216. *Id.*

217. *See* G7 Working Group on Stablecoins, *supra* note 19.

218. *Id.*

219. Kathryn Petralia, et al., *Banking Disrupted? Financial Intermediation in an Era of Transformational Technology*, CEPR (Sept. 2019), https://cepr.org/content/geneva-report-22-banking-disrupted-financial-intermediation-era-transformational-technology.

220. *Global STI Trends*, STI, (Mar. 2017), http://www.naci.org.za/STIForesight2018/index.php/relevant-documents/technology-trends-global/598-global-sti-trends-for-foresight-march-2017/file.

221. Ahmed Banafa, *Libra: Technological and Business Challenges*, OpenMind, (Aug. 21, 2019), https://www.bbvaopenmind.com/en/economy/finance/libra-technological-and-business-challenges/.

security,[222] limited interoperability, code rigidity, and overall instability. These may be restated in terms of market fragmentation, asset protection, loss of privacy, complexity, displacement, separation, reduced competition, increased concentration, confusion, limited functionality, technology lock, and governance failure.[223]

The most significant difficulties that arise are possibly concerned with the decentralisation of markets and consequent disruption to traditional forms of regulation and supervision which may specifically lead to supervisory divisions or gaps and regulatory dilution and dislocation.[224] While commentators refer to the advantages of decentralisation, this only applies with regard to ledger access and revision on the basis of the agreed consensus mechanisms established.[225] Blockchain operates on a highly centralised basis with a single ledger and with multiple copies of the ledger having to be maintained at any point in time.[226] While this was intended to reduce single point of failure (SPF) and single point of attack (SPA) difficulties, this creates a corresponding series of problems in terms of multiple point of access (MPAs) or multiple possible points of attack (MPAt) and with consequential multiple point of failure (MPF).[227]

Significant levels of new technology and digital information and data risk also arise. Substantial amounts of technological dependence are created with firms having to rely on technology that can fail with possibly limited continuity planning protections and no substitute forms of product or service delivery. Substantial levels of dependence are created with firms having to rely on small groups of specially trained staff. High levels of concentration can arise with technology itself acting as a highly conducive conductor of loss and loss transmission. This substantially increases the dangers of exceptionally fast contagion with unclear emergent effects and a

222. Fran S., *Steve Sprague's Security Analysis of the Libra Blockchain*, DITTO TRADE, (July 8, 2019), https://www.dittotrade.academy/market-news/crypto/libra/libra-steve-sprague-security-analysis-of-the-libra-blockchain/; Josh Constine, *The Real Risk of Facebook's Libra Coin Is Crooked Developers*, TECH CRUNCH, (Jun. 18, 2019), https://techcrunch.com/2019/06/18/libra-analytica/.

223. *The Rise of Libra and Potential Challenges*, INT'L DIR., (Aug. 12, 2019), https://internationaldirector.com/finance/the-rise-of-libra-and-potential-challenges/. Diego Zuluaga, *Of Libras and Zebras: What Are the True Financial Risks of the Facebook-Led Digital Currency?*, CATO INST., (July 17, 2019), https://www.cato.org/blog/libras-zebras-what-are-true-financial-risks-facebook-led-digital-currency-part-iii-national.

224. Ross Buckley, *Regulating Libra*, HARV. L. SCH. F. IN CORP. GOVERNANCE, (July 10, 2019), https://corpgov.law.harvard.edu/2019/07/10/regulating-libra/.

225. *Backlash to Facebook's Libra Accentuates the Importance of Decentralization*, NZE NEWS, (July 3, 2019), https://nzenews.com/2019/07/03/backlash-to-facebooks-libra-accentuates-the-importance-of-decentralization/.

226. *What Is Blockchain?*, LEDGER, (Oct. 23, 2019), https://www.ledger.com/academy/blockchain/what-is-blockchain/.

227. *See generally* Ross Mauri, *Three Features of Blockchain that Help Prevent Fraud*, IBM, (Sept. 19, 2017), https://www.ibm.com/blogs/blockchain/2017/09/three-features-of-blockchain-that-help-prevent-fraud/; Kris Martel, *Blockchain: The Good, the Bad, and the Ugly*, U.S. CYBERSECURITY MAG., https://www.uscybersecurity.net/csmag/blockchain-good-bad-ugly/.

substantial increase in uncertainty and risk of systemic crisis and collapse.[228] Digital coins may also be exposed to possible denial of access, denial of choice, no substitution, and dependence on a lack of support or redress.

Additional exposures can also arise in terms of business disruption, user and stakeholder interest, markets, regulation and control, infrastructure, central banking and monetary policy, and more general financial stability.

The G7 Finance Ministers and Central Bank Governors accepted that may raise significant regulatory and systemic concerns at their Chantilly Meeting in July 2019.[229] Ministers and Governors agreed that initiatives had to satisfy high standards of financial regulation with regulatory gaps being corrected.[230] The G7 confirmed in its subsequent report on GSCs on October 2019 that no project should be allowed to commence operation until all legal and regulatory oversight challenges and risks had been addressed.[231] The G7 identified a number of general legal, regulatory, oversight, and public policy issues,[232] and three specific challenges that arose with regard to GSCs.[233]

It is essential to ensure that all of these potential vulnerabilities are properly identified, quantified, and managed over time.

V. Libra Legal and Regulatory Issues

A number of significant initial legal and regulatory issues arise in determining the nature of the new Libra coin in law and constructing an appropriate regulatory control framework. As a new digital coin, Libra, effectively exists in a form of supervisory and regulatory vacuum pending further clarification. The G7 group has examined this[234] while it would also be considered by other international bodies such as the FSB and IMF and with domestic authorities reviewing all of the relevant policy considerations that arise.[235]

It is essential to ensure that a clear, certain, and consistent legal and regulatory regime is created for Libra and SuperCoins or SuperApps. The G7 has stressed the need to construct a "well founded, clear and transparent legal basis" for payment, clearing, and settlement arrangements.[236] All technical arrangements for any new must be subject to certain and predictable legal specification. A wide variety of different and possibly

228. Barry Eichengreen, *Libra: The Known Unknowns and Unknown Unknowns*, VOXEU (Sept. 4, 2019), https://voxeu.org/article/libra-known-unknowns-and-unknown-unknowns.

229. *Chair's Summary: Finance Ministers and Central Bank Governors*, GOUVERNEMENT, at 2 (July 17–18, 2019), https://www.gouvernement.fr/en/chair-s-summary-g7-finance-ministers-and-central-bank-governors-meeting.

230. *Id.* at 2–3.

231. *See* G7 Working Group on Stablecoins, *supra* note 19.

232. *Id.* at 2.1.1–3.

233. *Id.*

234. *Id.* at 29(5).

235. G7 Working Group on Stablecoins, *supra* note 19.

236. *Id.* at Sec. 2.1.1.

conflicting underlying contractual and legal and regulatory measures may apply in practice. Specific issues arose with regard to legal definition, contractual or property classification, associated rights and obligations, and remedies in addition to confirming the legal nature of the underlying digital information and data used in the code created.[237] Separate issues arise with regard to determining the most appropriate governing law[238] and jurisdiction[239] to resolve cross-border disputes.[240]

A series of specific legal questions arise in terms of definition and determination of the particular legal framework and obligations to apply to Libra and others. A series of wider regulatory issues also arise.[241] A number of provisional legal and regulatory issues can be identified with regard to Libra coin.

A. MONEY

It is unclear whether Libra coin will constitute money. Money is generally defined in terms of its economic functions of acting as a store of value, medium of exchange, and unit of account.[242] It is commonly accepted that cryptocurrencies are a poor store of value due to their high volatility. They are an inefficient medium of exchange due to their low use and

237. *See* G7 Working Group on Stablecoins, *supra* note 19, at sec. 2.1.1. (stating G7 refers to money equivalence, contractual claims and property rights and rights against the issuer or underlying asset); *See also* G.A. Walker, *Digital Information Law - Meaning, Challenge and Future*, *supra* note 5 (speaking on the nature of digital information, data and on the nature of digital property).

238. A "digital waterfall" approach can be developed which extends the existing Place of the Relevant Intermediary Approach (PRIMA) approach used in relation to international securities holdings and especially for custody and collateral transactions. PRIMA was adopted within the European Union under the Settlement Finality Directive in 1998 and 2002. The governing law is that agreed between the parties (art. 4) failing which the location of the account (art. 5 (1)) or the place of incorporation or principal place of business of the intermediary (art. 5 (2) and (3)). PRIMA can be extended in the digital area to include inter alia: (a) place of relevant administrator account (PRAMA); (b) place of relevant operating account (PROPA); and (c) Primary Residence of private Encryption Master Account (PREMA). *See Convention on the Law Applicable to Certain Rights in Respect of Securities Held with an Intermediary*, HCCH (July 5, 2006) (adopting a "digital waterfall" approach). Equivalent ideas were adopted by the Financial Markets Law Committee (FMLC) in FMLC. The author was a member of the Working Group. *See Distributed Ledger Technology and Governing Law: Issues of Legal Uncertainty*, FMLC (Mar. 2018), http://fmlc.org/wp-content/uploads/2018/05/dlt_paper.pdf. On U.S. law, *see generally* ERICA JOHANSSON, PROPERTY RIGHTS IN INVESTMENT SECURITIES AND THE DOCTRINE OF SPECIFICITY (Springer, Berlin, Heidelberg, 2009).

239. *See* sources cited *supra* note 238 (showing an equivalent "digital jurisdiction waterfall" can be construed).

240. G7 Working Group on Stablecoins, *supra* note 19, at sec. 2.1.1.

241. *Id.* at sec 7(8).

242. *See* CHARLES PROCTOR, MANN ON THE LEGAL ASPECT OF MONEY (OUP Oxford, 6th ed. 2005).

acceptance. They are rarely used as units of account.[243] Libra is intended to act as a common means of payment with its value being stabilised by being tied to a basket of currencies and government assets.[244] It is arguable that Libra will not constitute money although it may be a form of currency.

Whether an asset constitutes money in law is simply a matter of definition. Money is described in this paper as a complex or combination concept with its meaning being dependent on party use and intent.[245] It is for this reason that money is given a wide definition in, for example, shipping charter party and testamentary disposition cases.[246] Money generally refers, for the purposes, of this paper, to any item that is denominated in the form of an official reference asset which would include coinage and banknotes as well as bank accounts, as all of these are either issued directly or indirectly by the state or used with the authority of the state.[247]

The term currency is generally used to refer to other assets that carry out monetary functions without being denominated in the local domestic monetary unit, which would include foreign exchange and other private currencies.[248] This may include digital monetary units.[249] Libra could therefore be classified as a form of currency rather than money.

B. PAYMENT

The principal motivation for Libra is to act as a new form of payment media.[250] The Libra Association will consequently have to register as a payment provider in all relevant jurisdictions where some degree of payment regulation is in place. This will include being registered as a money transfer service or transmitter in the United States[251] or as a payment provider in the

243. Mark Carney, Bank of England Governor, Speech to the Inaugural Scottish Economics Conference, Edinburgh University (Mar. 2, 2018), *in The Future of Money*, BANK OF ENG., at 6–9 (Mar. 2, 2018), https://www.bankofengland.co.uk/-/media/boe/files/speech/2018/the-future-of-money-speech-by-mark-carney.pdf?la=EN&hash=A51E1C8E90BDD3D071A8D6B4F8C1566E7AC91418.

244. G7 Working Group on Stablecoins, *supra* note 19, at sec. 2(4).

245. *See also* Proctor, *supra* note 242.

246. Committee on Payment and Settlement Systems, *A Glossary of Terms Used in Payments and Settlement Systems*, BANK FOR INT'L SETTLEMENTS [BIS] (Mar. 2003), https://www.bis.org/cpmi/glossary_030301.pdf.

247. *See Money*, BK101 KNOWLEDGE BASE, http://www.basicknowledge101.com/subjects/money.html (last visited July 23, 2020).

248. *Money as a Tool*, LUMEN, https://courses.lumenlearning.com/boundless-business/chapter/money-as-a-tool/ (last visited July 23, 2020).

249. *Virtual Currency*, INVESTOPEDIA, (Jun. 30, 2020), https://www.investopedia.com/terms/v/virtual-currency.asp.

250. *See* Libra Ass'n Members, *supra* note 101.

251. Money transmitters are regulated at the state rather federal level in the United States. *See* Adam Atlas, *Money Transmitter Licensing*, MONEY TRANSMITTER BLOGSPOT (Jan. 28, 2010), https://moneytransmitterlicense.blogspot.com.

United Kingdom under the Payment Services Regulations 2017[252] which implemented the EU Payment Services Directive 2 (PSD2).[253]

Persons engaged with virtual currencies may constitute money transmitters or money services businesses (MSBs) for FinCEN purposes.[254] Stablecoins would generally constitute a "convertible virtual currency" (CVC).[255] FinCEN issued guidance on the application of its Regulations to CVCs in May 2019.[256] The guidance explains how FinCEN applies its obligations in relation to money laundering under the Bank Secrecy Act (BSA) 1970.[257]

Stablecoin issuers may be required to obtain separate money transmitter licenses at the state level with many states participating in the Nationwide Multi-State Licensing System and Registry (NMLS).[258] Parties involved with stablecoins, including issuers, exchanges, and dealers, have to be careful not to issue stablecoins to U.S. persons or through U.S. intermediaries or information technology infrastructure as this may trigger the exterritorial application of U.S. law.[259]

It was reported that Novi had applied for a money transfer licence and registered with FinCEN as a money services business.[260] It had sought a licence to operate a cryptocurrency business in New York through the New York Department of Financial Services.[261] It was not expected that Novi would apply for a local banking licence in each country with reserves being subject to monetary policies within countries.[262]

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252. Payment Services Regulations 2017, SI 2017/752 (Eng.).

253. *See* Council Directive 2015/2366, 2015 O.J. (L 337).

254. *Money Services Business Definition*, FINCEN, https://www.fincen.gov/money-services-business-definition (last visited July 27, 2020).

255. A virtual currency is "a medium of exchange that operates like a currency in some environments but does not have all the attributes of real currency [and] . . . does not have legal tender status in any jurisdiction." A CVC is a type of virtual currency that has an equivalent value in real currency or acts as a substitute for real currency. *See* U.S. TREASURY FIN. CRIMES ENF'T NETWORK, FIN-2019-G001, APPLICATIONS OF FINCEN'S REGULATIONS TO CERTAIN BUSINESS MODELS INVOLVING CONVERTIBLE VIRTUAL CURRENCIES, at 7 (May 9, 2019).

256. *Id.*

257. The Guidance covers seven specific business models: (a) P2P exchanges; (b) CVC wallets; (c) CVC kiosks; (d) decentralised applications (DApps); (e) anonymity-enhanced CVC transaction; (f) payment processing services; and (g) internet casinos. FinCEN Guidance (n). *See* Jesse Overall et al., *Stablecoins: A Global Overview of Regulatory Requirements in Asia Pacific, Europe, the UAE and the US*, CLIFFORD CHANCE LLP, 8 (Sept. 2019), https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2019/09/stablecoins-a-global-overview-of-regulatory-requirements-in-asia-pacific-europe-the-uae-and-the-us.pdf.

258. *Id.* at 8–9.

259. *Id.* at 9.

260. Anna Irrera & Katie Paul, *Facebook's Libra Coin Likely to Run a Regulatory Gauntlet*, REUTERS (June 28, 2019), https://in.mobile.reuters.com/article/amp/idINKCN1TT30A.

261. *Id.*

262. *Id.*

C. BANKING

The Libra Association would require a separate banking license to the extent that it wished to carry out deposit taking and lending services in any particular country.[263] The Libra website states that there is no intention to apply for separate banking licenses initially, although this may clearly become relevant later.[264] This will raise significant regulatory and more general policy issues.

The meaning of the terms bank and banking are unclear under many laws as with money. Banking in the United Kingdom has traditionally been defined in terms of deposit taking business, which includes both the receipt of funds from the general public and the making of loans.[265] EU law focuses on the definition of a credit institution, which is an entity that accepts repayable funds from the general public and advances credit on its own account.[266] A separate dual banking system was adopted in the United States with banks being regulated at both the state and federal level.[267] A bank is defined for Federal purposes as an institution that receives deposits and makes loans and discounts or exercises fiduciary powers.[268]

The Libra Association would become subject to all relevant domestic banking regulation to the extent that it wished to conduct banking business through the receipt of deposits and advance of credits. This would require it to maintain substantial initial and continuing capital and liquidity as well as comply with all other requirements on management and systems and controls. A new EU banking operation would be subject to all of the requirements imposed under the CRD IV Directive and Regulation (CRR) as well as other measures forming part of the European Banking Rulebook maintained by the European Banking Authority.[269] A business unit in the United Kingdom would be subject to regulation by the Prudential Regulation Authority (PRA) and all of the relevant provisions set out in the PRA Rulebook including CRD IV.[270] U.S. banking operations would be

263. *Id.*

264. *See* Section VII below.

265. Banking Act 1979, c.37 (Eng.); Banking Act 1987, c. 22 (Eng.).

266. *See* Council Directive No. 2013/36, 2013 O.J. (L 176); Commission Regulation No. 575/2013, 2013 O.J. (L 176).

267. OFF. OF THE COMPTROLLER OF NAT'L BANKS, NATIONAL BANKS AND THE DUAL BANKING SYSTEM, (Sept. 2003).

268. *See* 26 U.S.C. § 581 (1976) (defining "bank" as "a bank or trust company incorporated and doing business under the laws of the United States (including laws relating to the District of Columbia) or of any State, a substantial part of the business of which consists of receiving deposits and making loans and discounts, or of exercising fiduciary powers similar to those permitted to national banks under the authority of the Comptroller of the Currency, and which is subject by law to supervision and examination by State or Federal authority having supervision over banking institutions.").

269. *See* Commission Regulation No. 575/2013, *supra* note 266.

270. Bob Penn, Allen & Overy, *Banking Regulation in the UK: Overview*, REUTERS, (Aug. 1, 2018) https://uk.practicallaw.thomsonreuters.com/w-008-0211?transitionType=default&contextData=(c.Default)&firstPage=true.

subject to relevant state laws and provisions adopted under the Banking Act 1933 and Bank Holding Company 1956 and other related statutes.[271]

Separate controls on lending may also be relevant if the Libra Association decides to provide more specific loan services over time. These would, for example, include the Consumer Protection Act 1974 in the United Kingdom which regulates provision of consumer credit contracts worth up to £5,000.[272] This followed the recommendations of the Crowther Committee in 1965. The limit was subsequently extended to £25,000 with no limit then imposed under the Consumer Credit Act 2006.[273] The consumer credit regime was formally administered by the Director General of Fair Trading and is now managed by the FCA.[274] UK consumer protection law was consolidated under the Consumer Rights Act 2015 which applies to consumer contracts for goods, digital content and services, unfair contract terms, and other general provisions, including competition law, disclosures, and secondary ticketing.[275]

A stablecoin may constitute a deposit under U.S. law[276] or other evidence of debt which would require an issuer of stablecoins to be licensed as a bank or trust company.[277] Paxos Trust which issues the Paxos Standard (PAX) stablecoin and the Gemini Trust which issues the Gemini dollar (GUSD) are licensed as limited trust companies in New York and hold dollar deposits with third party banks to be eligible for Federal Deposit Insurance Corporation (FDIC) payments.[278] Other stablecoin issuers in New York have obtained a BitLicense from the New York Department of Financial Services and maintain segregated accounts with licensed banks.[279]

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271. *See Laws & Regulations*, FDIC, https://www.fdic.gov/regulations/laws/ (last visited July 27, 2020).

272. The Act generally applies to regulated consumer credit agreements, regulated consumer hire agreements, and partially regulated agreements. *See* Consumer Credit Act 1974 ch. 39 §§ 8, 15 (Eng.). Individual is defined to include a partnership or other unincorporated bodies excluding registered companies or corporations created by act of Parliament or royal charter. *Id.* at 89(1).

273. Consumer Rights Act 2006, c.14 (Eng.).

274. Jake Green & James Perry, *OFT to FCA: Two Years of FCA Regulation of the Consumer Credit Industry*, ASHURST (Apr. 1, 2016), https://www.ashurst.com/en/news-and-insights/legal-updates/oft-to-fca-two-years-of-fca-regulation-of-the-consumer-credit-industry/.

275. Consumer Rights Act 2015, c. 15 (Eng.).

276. A deposit is the placing of money with the bank to be written upon the depositor's demand or under rules or regulations agreed upon. Federal Deposit Insurance Act, 12 U.S.C. 1813(l)(1)–(5).

277. N.Y. BANKING LAW § 131 (McKinney 2008) (prohibiting parties other than banks or trust companies from issuing notes or other evidences of debt to be loaned or put in circulation as money or receiving deposits).

278. Overall et al., *supra* note 257 at 6.

279. *Id.*

D. SECURITY

It is unlikely that Libra would initially constitute a security under U.K., EU, and probably U.S. law. Security is defined narrowly under the UK Financial Services and Markets Act (FSMA) 2000 and Regulated Activities Order (RAO).[280] EU definitions of financial instruments[281] and transferable securities[282] are more inclusive, but still constrained under the second Markets in Financial Instruments Directive (MiFID 2). Security is defined much more extensively under U.S. law as this includes investment contracts under the Howey test.[283] The Securities and Exchange Commission (SEC) has confirmed that this would not apply to cryptocurrencies used solely for payment purposes such as Bitcoin.[284] It is expected that Libra by analogy would generally not be considered to constitute a security under U.S., EU, and UK laws. This may nevertheless change over time depending upon its specific use and application and this may vary in other geographical areas or territories.

The Howey test generally requires that an investment contract is an investment of money, in a common enterprise, in which profits are expected and derived from the entrepreneurial and managerial efforts of others.[285] The SEC issued a Framework for Digital Asset Analysis[286] in April 2019 which exempts stablecoins that are not likely to appreciate in value.[287] Libra may not be considered to involve a common enterprise,[288] there is no profit with the price stabilised[289] and with any profit deriving from market conditions rather than third party managerial efforts. Fixed redemption

280. *See Consultation Paper: Guidance on Cryptoassets*, FCA (Jan. 2019), https://www.fca.org.uk/publication/consultation/cp19-03.pdf; *see also* Financial Services and Markets Act 2000 (Regulated Activities), c. 8, art. 5, 74 (Eng.).

281. Council Directive 2014/65, art. 4, 2014 O.J. (L 173) Annex I § C (EU) (listing eleven categories of financial instruments).

282. The European Union defines transferable securities as "those classes of securities that are negotiable on a capital market (excluding instruments of payment) but including: (a) shares in companies and other securities equivalent to shares in companies, partnerships or other entities and depository receipts in shares; (b) bonds or other forms of securitized debt, including depository receipts in such securities; and (c) any other securities granting the right to acquire or sell any such transferable securities or giving rise to a cash settlement determined by reference to transferable securities, currencies, interest rates or yields, commodities or other indices or measures." *Id.* at 1, 44. *See also* Eur. Sec. & Mkts. Auth [ESMA], *Own Initiative Report on Initial Coin Offerings and Crypto-Assets*, ESMA22-106-1338 (Oct. 19, 2018).

283. SEC v. W.J. Howey Co., 328 U.S. 203 (1946) (extending the definition of a security in the United States to include an investment contract; this case was the leading case to define security).

284. *Framework for 'Investment Contract' Analysis of Digital Assets*, SEC (Apr. 3, 2019), https://www.sec.gov/corpfin/framework-investment-contract-analysis-digital-assets#edn1.

285. *Id.*

286. *Id.*

287. *See* TurnKeyJet, Inc., SEC No-Action Letter, James Prescott Curry (Apr. 2, 2019).

288. Overall et al., *supra* note 257 at 4.

289. NOA v. Key Futures, Inc., 638 F.2d 77 (1960) (stating fluctuations in the silver market were held not to constitute an investment contract).

currency backed stablecoins should not constitute securities[290] although difficulties may arise with variable redemption stablecoins and algorithmic stablecoins.[291]

E. COMMODITY

The definitions of commodity would have to be considered, in particular, under U.S. law to confirm the extent to which the jurisdiction of the Commodity Futures Trading Commission (CFTC) would apply under the Commodity Exchange Act (CEA).[292] The CFTC had been set up in 1974 and is principally responsible for the regulation of commodity futures and option markets in the United States.[293] Libra related activities would become subject to the CEA and CFTC if they involved futures or options or other derivative related contracts. Libra may be considered to constitute a spot commodity and become subject to the anti-fraud and anti-manipulation jurisdiction of the CFTC.[294] A currency stablecoin may not constitute a derivative provided it is sold at one-hundred percent of redemption value, no leverage or periodic margin payments are involved, and physical settlement is available.[295]

F. COLLECTIVE INVESTMENT SCHEME

Promoters of new digital asset arrangements have to consider whether this may constitute a collective investment scheme under U.K. or EU law or an

290. *See* Clifford Change, *supra* note 20. (first citing Leighton v. S.E.C., 221 F.2d 91 (1955); then *Trading Stamps*, SEC Release No. 3890, 1958 WL 2204 (Jan. 21, 1958); and then *No-Action Position Relating to Certain Offerings of Gold*, SEC Release No. 5552, 1974 WL 161724 (Dec. 26, 1974)).

291. *See* Overall et al., *supra* note 257 at 5–6.

292. The Commodity Futures Trading Commission (CFTC) defines a commodity as "(1) A commodity under the Commodity Exchange Act includes the agricultural commodities enumerated in Section 1a(4) of the Commodity Exchange Act, 7 USC 1a(4) and all other goods and articles excepts onions as provided in Public Law 85/839 (7 USC 13-1) which banned futures trading in onions, and all services, rights and interests in which contracts for future delivery are presently or in the future dealt in; (2) A physical commodity such as an agricultural product or a natural resource as opposed to a financial instrument such as a currency or interest rate." *CFTC Glossary: A Guide to the Language of the Futures Industry*, CFTC, https://www.cftc.gov/LearnAndProtect/EducationCenter/CFTCGlossary/glossary_co.html (last visited Aug. 17, 2020).

293. *Id.* (defining a futures contract as "[a]n agreement to purchase or sell a commodity for delivery in the future: (1) at a price that is determined at initiation of the contract; (2) that obligates each party to the contract to fulfil the contract at the specified price; (3) that is used to assume or shift price risk; and (4) that may be satisfied by delivery or offset," and defining an option as [a] contract that gives the buyer the right, but not the obligation, to buy or sell a specified quantity of a commodity or other instrument at a specific price within a specified period of time, regardless of the market price of that instrument").

294. The CFTC succeeded in an action alleging fraud in virtual currencies, including Bitcoin and Litecoin, in CFTC v. McDonnell, 287 F. Supp 3d 213 (E.D.N.Y. 2018).

295. Chance, *supra* note 230, at 7.

investment contract under U.S. law. A collective investment scheme is defined under § 235 of the Financial Services and Markets Act (FSMA) in the United Kingdom.[296] The risk is that digital token schemes could be considered to constitute an arrangement managed by the organisers, and possibly miners, that allow participants to profit from the sale, disposal, or management of the tokens concerned. It is nevertheless questionable to what extent token owners have surrendered day to day control over the management of the tokens,[297] whether the contributions and profits of token holders are pooled and if there is an identifiable operator on behalf of whom the property is managed as a whole.[298] Where the contributions or profits are pooled, participants must also be able to exchange rights between different parts of the scheme.[299]

It is unlikely that many digital coin schemes may constitute collective investment schemes although equity tokens may constitute securities under U.K., EU, and U.S. law and related arrangements collective investment schemes under U.K. and EU law and investment contracts under U.S. law. The circumstances of each specific scheme would have to be examined in further detail.

G. Market Infrastructure

The stable operation of payment and infrastructure systems are essential to financial systems and economies.[300] Significant infrastructure disruption can create systemic risk. Infrastructure protection has attracted increased attention at national regulatory levels with specific frameworks being set up in this regard, such as within the Bank of England.[301] While relevant standards are generally technology neutral, Libra would be expected to comply with relevant domestic provisions.

Libra Association would have to consider to what extent the Libra arrangements may constitute an infrastructure scheme and be subject to relevant domestic provisions in each country concerned. General principles concerning financial market infrastructures (PFMI) have been produced by the Committee on Payment and Settlement Systems (CPSS and now the Committee on Financial Market Infrastructures (CFMI)), and the Technical

296. A collective investment scheme means "any arrangements with respect to property of any description, including money, the purpose or effect of which is to enable persons taking part in the arrangements (whether by becoming owners of the property or any part of it or otherwise) to participate in or receive profits or income arising from the acquisition, holding, management or disposal of the property or sums paid out of such profits or income." Financial Services and Markets Act 2000, *supra* note 280, at § 235(1).

297. *Id.* at § 235(2).

298. *Id.* at § 235(3)(a), (b).

299. *Id.* at § 235(4).

300. G7 Working Group on Stablecoins, *supra* note 19, at § 2.1.4.

301. *Financial Market Infrastructure Supervision*, Bank of Eng. (June 4, 2020), https://www.bankofengland.co.uk/financial-stability/financial-market-infrastructure-supervision; *See also* George Walker et al., Financial Services Law (4th ed. 2018).

Committee of the International Organisation of Securities Commissions (IOSCO) in April 2012.[302] Financial market infrastructure is defined as any multilateral system between participating institutions, including the system operator, used for the purposes of clearing, settling, or recording payments, securities, derivatives, or other financial transactions.[303] Official and private domestic systems apply these principles in practice.

H. Note Issuance and Legal Tender

Domestic central banks are generally given monopoly rights on domestic banknote issuance. This includes the Bank of England's monopoly under the Bank Charter Act 1844[304] and the Federal Reserve's monopoly in the United States.[305] Treasuries or Mints are also given parallel monopoly rights to issue metal coins. Central banks and governments are generally not concerned with private digital currencies to the extent that they have provisionally remained of limited relative value. These restrictions generally do not apply to the issuance of private digital currencies such as Bitcoin, which are not paper notes or metallic coins. Countries may consider extending existing legal and regulatory regimes to include Libra as monetary policy or other concerns arise.[306]

Domestic legislative law also determines the legal tender status of domestic coins and banknotes. This is usually achieved by specifying that specific amounts of metal coins are legal tender up to particular values and that banknotes are legal tender more generally.[307] The legal significance of this is that legal tender has to be accepted by a creditor in discharge of a debt. Legal tender status would not apply to Libra in the absence of separate legislative amendment.

I. Counterfeiting

Domestic legislation prohibits the counterfeiting of money. It is, for example, an offence under the Forgery and Counterfeiting Act 1981 in the United Kingdom to make a counterfeit of a currency note or of a protected coin or tender this as genuine without lawful authority or excuse.[308]

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302. Committee on Payment and Settlement Systems, *Principles for Financial Market Infrastructures*, Bank for Int'l Settlements [BIS] (Apr. 2012), https://www.bis.org/cpmi/publ/d101a.pdf.

303. Twenty-four principles are imposed with five additional responsibilities defined in terms of central banks, market regulators, and other authorities involved with financial market infrastructure. *Id.* at 7, ¶ 1.8. These may be applicable to the Libra Association to the extent that it is involved infrastructure activities.

304. Bank Charter Act 1884, 7 & 8 Vict. c.8, § 1 (Eng.).

305. Federal Reserve Notes are issued under Federal Reserve Act § 16, (codified as amended at 12 U.S.C. § 411).

306. *See* discussion *infra* Section VII.C.

307. Legal tender is dealt with in the United Kingdom under the Coinage Act 1971, c.24 (Eng.). *See also* Currency Act 1983, c.9 (UK).

308. Forgery and Counterfeiting Act 1981, c. 45, § 14 (Eng.).

Additional offences are imposed on passing, custody, and control, and materials and implements as well as importation and exportation.[309] A separate offence is committed for reproducing currency notes or in imitating coins.[310] Parties can be convicted of up to ten years imprisonment on indictment.[311] A coin is defined in relation to legal tender which would not include digital currencies. Domestic counterfeiting laws would again have to be revised if they were to apply to private digital currencies such as Libra.

J. Anti-Money Laundering and Terrorist Financing

Commercial banks are subject to anti-money laundering (AML) and counter-terrorist financing (CFT) restrictions.[312] Central banks are generally exempt.[313] Any new credit institutions and financial institutions are subject to the European Money Laundering Directives, which have been extended to include professional parties as well as trusts or company service providers, estate agents, goods, merchants (receiving cash over €10,000), and gambling service providers.[314] These measures were extended again under the Fifth Money Laundering Directive.[315] Governments would have to consider to what extent further revisions would be required to include digital currencies, digital currency operators such as the Libra Association, digital wallet providers such as Novi, and digital exchanges within these regimes.

K. Data Protection and Information Provision

Any data collected by the Libra Association and Novi would become subject to the EU General Data Protection Regulation (GDPR) and UK Data Protection Act (DPA) 2018 to the extent that this constituted personal data.[316] Personal data means any information relating to an identified or identifiable natural person with identification including direct or indirect sources.[317] Six general principles are imposed under the GDPR with additional provisions on exceptions for national security, criminal and taxation purposes and in relation to enforcement actions and surveillance contained in the DPA 2018.[318] In the United States, other specific protections are provided such as under the Federal Trade Commission Act, which empowers the FTC to bring enforcement actions to protect consumers against unfair or deceptive practices and to apply federal privacy

309. *Id.* at §§ 15–17, 20–21.
310. *Id.* at § 14.
311. *Id.* at §§ 18–19, 22.
312. *See* discussion *infra* Section VII.G; *see also infra* notes 433–35.
313. The Bank of England is exempt under the Money Laundering, Terrorist Financing and Transfer of Funds (Information on the Payer) Regulations 2017, SI 2017/692 § 15(4)(c) (Eng.).
314. Council Directive 2015/849, art. 2, 2015 O.J. (L 141) 83.
315. Council Directive 2018/843, 2018 O.J. (L 156) 43.
316. Commission Regulation, 1967 O.J. (L 119) 1.
317. *Id.* at 33, art. 4(1).
318. *Id.* at 35, art. 5(1)(a)–(f). For source of U.S. federal protections, see Privacy Act of 1974, 5 U.S.C. § 552a.

and data protection laws.[319] This applies to personal identifiable information maintained on federal agency records. The Libra Association and Novi would be subject to all relevant national laws on data protection. Parallel sets of provisions are imposed with regard to anti-terrorist financing.[320]

Public authorities are generally subject to obverse provisions on the disclosure of public information. This includes disclosure under the Freedom of Information Act 2000 in the United Kingdom.[321] Persons are entitled to be informed in writing by public authorities whether they hold information of a specified description and to have the relevant information communicated.[322] This is subject to the exemptions set out in Part II of the Act.[323] This would not apply to disclosure which may prejudice the economic interests of the United Kingdom (or any part of the United Kingdom) or where the financial interests of any administration in the United Kingdom would be prejudiced.[324] The Libra Association would generally not be subject to such provisions to the extent that it is not a public authority although this should be confirmed. Specific legislatures may decide to extend equivalent provisions to apply to the association in particular cases.

L. Cyber Security

Financial firms must maintain necessary safeguards against potential cyber threats and attacks and have appropriate continuity planning in place to allow them to continue in operation and protect legacy and current data at all times. Stablecoins could be impacted through their core infrastructure or separate trading platforms or wallets.[325] Distributed ledgers may have some additional resilience, in particular, through the use of decentralisation and cryptographic access controls, although blockchain still operates on the basis of a single centralised ledger.[326]

Cybersecurity is generally dealt with as a form of operational risk with firms being required to maintain appropriate systems, policies, procedures and controls. The U.K. FCA has published a number of papers in this area.[327] The FCA requires firms to develop an appropriate "security culture" to protect information assets, including hardware, software and people, detect breaches and respond to and recover from attacks with safeguard

319. Federal Trade Commission Act, 15 U.S.C. §§ 45, 57b-2a (1950).

320. *See, e.g.*, Anti-terrorism, Crime and Security Act 2001, c. 24, § 1 (Eng.); Terrorism (United Nations Measures) Order 2001, SI 2001/3365, § 3 (Eng.).

321. *See* Freedom of Information Act 2000, c. 36 (Eng.).

322. *Id.* at § 1(a), (b).

323. *See id.* at Part II.

324. *Id.* at § 29(1).

325. G7 Working Group on Stablecoins, *supra* note 19, at 8–9.

326. *See* Christina Majaski, *Distributed Ledgers*, Investopedia (May 12, 2020), https://www.investopedia.com/terms/d/distributed-ledgers.asp.

327. *See, e.g.*, *Cyber Resilience*, Fin. Conduct Auth. (May 18, 2017), https://www.fca.org.uk/firms/cyber-resilience.

measures being constantly updated.[328] Guidance is provided through the National Cyber Security Centre (NCSC)[329] which came into operation within the Government Communications Headquarters (GCHQ) in 2016.[330] The U.K. protection programme is set out in its National Cyber Security Strategy with the Government to invest £1.9 billion in infrastructure security.[331] While the risk of single point of attack (SPA) and single point of failure (SPF) is reduced, the extended access within distributed ledgers creates multiple points of access (MPA) and potential multiple points of failure (MPF).[332]

The U.S. National Institute of Standards and Technology (NIST) has created a Cybersecurity Framework with Version 1.0 published in 2014 and 1.1 in 2018.[333] Information security management system (ISMS) standards have also been produced by the International Organisation for Standardization (IOS) and the International Electrotechnical Commission (IEC) as part of a 27,000 series prepared by the Joint Technical Committee (JTC1) Subcommittee 27 (SC27).[334] A number of standards have been produced as part of the series covering information technology, management

328. *Id.*

329. *See* NAT'L CYBER SEC. CENT., https://www.ncsc.gov.uk/ (last visited Aug. 8, 2020).

330. The NCSC was established in October 2016 using expertise from the Communications Electronics Security Group (CESG) within Government Communications Headquarters (GCHQ), the Centre for Cyber Assessment, Computer Emergency Response Team (CERT UK), and the Centre for Protection of National Infrastructure (CPNI). The NCSC developed an understanding and practical guidance on cybersecurity, response to incidents, promote the development of UK cybersecurity capability and attempts to reduce risk by securing public and private sector networks. *See About the NCSC*, NAT'L CYBER SEC. CENT., https://www.ncsc.gov.uk/section/about-ncsc/what-we-do (last visited July 27, 2020).

331. *See National Cyber Security Strategy 2016-2020*, HM GOV'T, § 3–9 (2016), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/567242/national_cyber_security_strategy_2016.pdf. The strategy report lists threats, including cyber criminals, states and state-sponsored activities, terrorists, "hacktivists," "Script kiddies," and other vulnerabilities with the UK response. *Id.* at 18–20. The implementation plan is based on defense, deterrence and development with additional international action being taken and a separate set of metrics produced. *Id.* at 47.

332. *See Distributed Ledger Technology in Payment, Clearing and Settlement: An Analytical Framework*, BANK FOR INT'L SETTLEMENTS [BIS] 14 (Feb. 2017), https://www.bis.org/cpmi/publ/d157.pdf.

333. *See Framework for Improving Critical Infrastructure Cybersecurity, Version 1.1*, NAT'L INST. OF STANDARDS & TECH. (2018), https://nvlpubs.nist.gov/nistpubs/CSWP/NIST.CSWP.04162018.pdf. The Cybersecurity Framework was initially developed for critical infrastructure but can be applied to any section of community. *Id.* at 3. The framework uses business drivers to control cybersecurity risks in an Organization's risk management process based on a Framework Core (activities, outcomes, and informative references), Implementation Tiers and Framework Profile. *Id.* at v. The Framework is also intended to act as a model for international cooperation. *Id.* at 3.

334. *See, Information Security, Cybersecurity and Privacy Protection*, ISO/IEC JTC 1/SC 27, INT'L ORG. FOR STANDARDIZATION [ISO], https://www.iso.org/committee/45306.html (last visited July 19, 2020).

systems, security risk management, network and information security, intrusion prevention discovery and privacy, and confidentiality.[335]

The European Commission adopted a cybersecurity package in September 2013 with an EU Cybersecurity Act in April 2019.[336] The purpose was to strengthen the EU Agency for Network and Information Security (ENISA) including the implementation of the EU Directive on the security of Network and Information Systems (NIS).[337] The European Union proposed to create a single cybersecurity market based on appropriate products, services, and processes and to use a central certification framework based on the ENISA.[338]

The CPMI and IOSCO have published separate Guidance on cybersecurity in FMIs.[339] This supplements the PFMI and specifically the principles on governance, risk management, settlement finality, operational risk, and links.[340] The guidance identifies five primary cyber related risk management categories: governance, identification, protection, detection and response, and recovery.[341] These are to be considered in terms of testing, situational awareness and learning, and evolution.[342] The guidance is expected to be used by payments systems, central securities depositories (CSDs), securities settlement systems (SSSs), central counterparties (CCPs) and trade repositories (TRs), and any other forms of FMI.[343] It remains to be seen to what extent Libra will be subject to such measures.

VI. Libra Technology Challenges

The objective of Libra coin is to attempt to realise all of the principal advantages available through modern blockchain and distributed ledger technology at the same time as avoiding continuing limitations and constraints.[344] This may create a highly attractive composite market model

335. *See id.*

336. *See generally Resilience, Deterrence and Defence: Building Strong Cybersecurity for the EU*, JOIN/(2017)/450 final (Sept. 13, 2017); Commission Regulation 2019/881, On the European Union Agency for Cybersecurity (ENISA) and On Information Communications Technology Cybersecurity Certification and Repealing Regulation 526/2014/EU (Cybersecurity Act), 2019 O.J. (L 151) (EU).

337. *See* Directive 2016/1148, Of the European Parliament and Council of 6 July 2016 on Concerning Measures for a High Common Level of Security of Network and Information Systems Across the Union, 2016 O.J. (L 194) 1.

338. *Cybersecurity*, EUR. COMMISSION (July 7, 2020), https://ec.europa.eu/digital-single-market/en/cyber-security.

339. *See* CPMI & IOSCO, *Guidance on Cyber Resilience for Financial Market Infrastructures*, BANK FOR INT'L SETTLEMENT [BIS] (June 2016), https://www.bis.org/cpmi/publ/d146.pdf.

340. *See* Committee on Payment and Settlement Systems, *supra* note 302, at 7–10.

341. *See* CPMI & IOSCO, *Guidance on Cyber Resilience for Financial Market Infrastructures supra* note 339, at 1.

342. *Id.*

343. *See id.* at 7.

344. Libra provides a testnet to develop new programs. *Libra Blockchain Explorer*, LIBROWSER, https://librabrowser.io (last visited Aug. 9, 2020).

following the last twelve years of experimentation in the area beginning with the launch of Bitcoin in 2008 and 2009. It remains unclear whether these highly desirable although challenging technical aspirations can be achieved.

Libra has in effect created a SuperCoin, which may be extended to create a new SuperApp.[345] 2.4 billion people may initially use or experiment with Libra which represents around a third of the global population.[346] Blockchain and distributed ledger technology can provide a number of advantages especially in terms of speed, efficiency, and security with its decentralisation avoiding the need for expensive and high-risk central controls.[347]

Many blockchain experiments have nevertheless simply internalised external issues such as reconciliation and governance problems.[348] It may be possible to design appropriate solutions over time with these systems increasingly moving towards full automation without the need for human involvement in the mining and validation processes. Different governance models are also being experimented with, although no clear solution has yet been produced.[349] Blockchain may then not be appropriate for many government and public or official and high value functions, while experimentation in all areas of potential application should still be encouraged and supported.

It remains to be seen whether Libra and the Libra token can resolve all of the technical obstacles and challenges identified. A basic twelve-point architecture can be constructed to examine private digital currencies and other digital tokens and platforms.[350] This can be used to assess the effectiveness of the original Libra proposal. The following specific points may be considered.

A. DECENTRALISATION

The core advantage of distributed ledger technology and blockchain is referred to as being its decentralised nature of operation.[351] This means that access to the ledger and transaction verification is carried out on a localised

345. *See, e.g.*, *Introducing Super App: A New Approach to All-in-One Experience*, MEDIUM (Dec. 24, 2019), https://medium.com/@infopulseglobal_9037/introducing-super-app-a-new-approach-to-all-in-one-experience-8a7894e8ddd4.

346. *See, e.g.*, *id.*

347. See discussion *supra* Section III.

348. *See* Andrés Franco, *Facebook's Libra: Cure for the Common Cryptocurrency?*, AM. U.: KOGOD SCH. OF BUS. (Sept. 25, 2019), https://www.american.edu/kogod/news/facebook-libra-crypto.cfm.

349. *See, e.g.*, Rakesh Sharma, *Governance: Why Crypto Investors Should Care*, INVESTOPEDIA (Jun. 25, 2020), https://www.investopedia.com/tech/governance-why-crypto-investors-should-care/.

350. *See supra* note 11.

351. *See* Andrew Meola, *Distributed Ledger Technology & the Blockchain Explained*, BUS. INSIDER (Jan. 16, 2020), https://www.businessinsider.com/distributed-ledger-technology-blockchain.

and non-centralised basis.[352] Such systems are still highly centralised to the extent that they involve the creation of a single central ledger which is then held in multiple copy forms. The advantage of this is that it can remove the need for other separate ledgers to be maintained between participating parties, which then have to be separately reconciled, such as with bank accounts.[353] The disadvantage is that the ledger will necessarily become increasingly large over time, which means that it can only be held and used on more powerful computer systems.[354] Single point of access (SPA) and single point of failure (SPF) are then replaced with multiple points of access (MPA) and possible multiple points of failure (MPF),[355] although this is limited by the strength of the cryptographic access and transaction hashing controls.

Libra coin aspires to full decentralisation, although it has been accepted that it has to operate on a permissioned rather than permissionless basis at an early stage.[356] Programme access will then be restricted to the initial subscribing members to the Libra Association.[357] It is intended that this will be extended to one hundred leading technology, payment, and NGO institutions over time although associated difficulties can arise with regard to such open permissionless systems as Bitcoin.[358] It has to be accepted that substantial advantages arise in the use of closed permissioned models especially where each node or validator is of an experienced or sophisticated nature and has financial capital and a professional reputation to protect.[359] This combines the advantages of decentralisation with controlled access.

It may be that the Libra Association will conclude over time that it is more effective to operate with an extended validator base of between twenty-eight and one hundred professional institutions rather than making the system completely open and permissionless.[360] This might be referred to as creating a form of "Proof of Appointment," "Proof of Agency," or "Proof of Authority" (PoA) model in place of more traditional "Proof of Work" (PoW)

352. *See* Majaski, *supra* note 326.

353. *See* Marco Iansiti & Karim R. Lakhani, *The Truth About Blockchain*, 95 HARV. BUS. REV. 118 (2017).

354. *See* Dalia Adib, *What's Blockchain Got to Do with Edge Computing?*, STL PARTNERS, https://stlpartners.com/edge-computing/whats-blockchain-got.

355. *See* Andoni, et al., *supra* note 215.

356. *An Open and Competitive Network*, LIBRA, https://libra.org/en-US/open-competitive-network/#exploring-an-open-transparent-and-competitive-market-for-network-services-and-governance (last visited Aug. 11, 2020).

357. *See* Amsden et al., *supra* note 119, at 2.

358. *Id.* Forbes notes that with one hundred validating nodes, Libra "already feels more decentralised than most of the public chains controlled by several mining pools" with Libra being "a bold initiative for a new type of decentralised platform." Biser Dimitrov, *Enterprise Blockchain Is Redefined by Facebook Libra*, FORBES (June 26, 2019), https://www.forbes.com/sites/biserdimitrov/2019/06/26/enterprise-blockchain-redefined-facebook-libra/#3567dd55104f.

359. *See* SHERMIN VOSHMGIR, TOKEN ECONOMY (2019), *in Blockchains & Distributed Ledger Technologies*, BLOCKCHAINHUB BERLIN, https://blockchainhub.net/blockchains-and-distributed-ledger-technologies-in-general/ (last visited Aug. 9, 2020).

360. *See* Libra Ass'n Members, *supra* note 89; *see also* De, *supra* note 93.

and Proof of Stake (PoS) options.[361] It is reported that over one million nodes participate in the Bitcoin system which of itself incorporates delay and can create significant governance issues where each has a vote on any alteration within the decision taking model adopted.[362]

B. Digital Asset

The digital asset is stated to be the Libra coin with members also holding Libra Investment Tokens (LITs).[363] The legal nature of digital coins, such as Bitcoin and Libra, are unclear in law. It is specifically not certain whether these constitute property in law.[364] It is arguable that these should constitute property[365] and that modern property law can be reinterpreted and restructured to allow many different types of digital coins and tokens to be classified as property.[366] It is further unclear whether Libra will operate on the basis of an actual digital coin or simply a monetary unit and account type model which is considered further below.[367] The value of the Libra reserve base will also be vulnerable to foreign exchange fluctuations and financial shocks (including exchange controls), which could have a significantly disruptive effect.[368]

C. Digital Identification

The Libra Association will attempt to develop a common individual digital identity system which could be of particular value in connection with Libra specifically and independently from the Libra coin arrangement.[369] Novi and Facebook passwords will be separate with users having to create new identification credentials.[370] A common identity system will allow transparency and compliance with relevant AML and CTF laws. This could also allow parties to have full control over the digital identities including in terms of privacy and portability. It remains to be seen how this will be developed and operate in practice.

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361. *See, e.g.*, *Proof of Authority Explained*, Binance Academy, https://academy.binance.com/blockchain/proof-of-authority-explained (last visited July 29, 2020).

362. *See* discussion *infra* Section VII, L.

363. *See* Drey Ng, *The Second Token: Libra's Security Token*, Medium (July 14, 2019), https://medium.com/liquefy/the-second-token-libras-security-token-71e1b4d0bda8. (n 118).

364. G.A. Walker, *Digital Property Law: New Meaning and New Beginning*, 54 Int'l Law. (forthcoming 2021).

365. *Id.*

366. *Id.*

367. *See* discussion *infra* Section VI.E.

368. Wolf, *supra* note 162.

369. *See* discussion *supra* Section II.

370. Dimitrov, *supra* note 358.

D. Access Authentication

DLT access is generally controlled using dual public private key cryptography.[371] This limits access to the blockchain and authorises individual transactions with coin owners only controlling access through the use of the private key which is validated by the public key.[372] Libra would appear to follow market practice in this area.[373]

E. Value Transfer

All coins are to be held on the blockchain in a ledger state with values being transferred through transactions.[374] The unique feature of distributed and blockchain ledgers is that they become title registers with token title only being created, transferred, or destroyed on the ledger.[375] This is distinct from more traditional registers which are evidential with title being transferred through separate underlying contracts such as with house sales and separate written dispositions or missives. The technical details for Libra of the transactions are provided in the White Paper.[376] This includes transaction structure and execution.

Most blockchain and distributed ledger structures generally operate on a transaction rather than an account basis.[377] This holds transactions chronologically which creates a series of transfer records rather than net or final account balances.[378] This can be complex with many transactions involving the movement of large numbers of separate broken value units from previous transfers. Some systems provide account details such as with Ethereum.[379] Wallets can also display balances although this simply represents an aggregation of the underlying transfers received by the token owner.[380] The Libra White Paper claims that Libra will operate on an

371. *See Public Keys and Private Keys in Public Key Cryptography*, Sectigo, https://sectigo.com/public-key-vs-private-key (last visited July 29, 2020). Libra is expected to use an Edwards curve Digital Signature Algorithm (EdDSA) with an edwards25519 elliptic curve with smaller 32-byte public keys and 64 byte signature. *See* Andreas Baumhof, *Facebook's Libra Blockchain*, Quintessence Labs (Jun. 24, 2019), https://www.quintessencelabs.com/blog/facebooks-libra-blockchain.

372. *See Public Keys and Private Keys in Public Key Cryptography*, *supra* note 371.

373. *See Life of a Transaction*, Libra Assoc., https://developers.libra.org/docs/life-of-a-transaction (last visited July 29, 2020).

374. *See, e.g.*, *Transaction*, BitcoinWiki, https://en.bitcoin.it/wiki/Transaction (last visited July 20, 2020).

375. Amsden et al., *supra* note 119.

376. *See generally*, Libra Ass'n Members, *supra* note 89.

377. *See* Voshmgir, *supra* note 359.

378. *See id.*

379. *See generally*, *ETH Account Balance Checker*, Ethereum, https://etherscan.io/balancecheck-tool (last visited July 29, 2020).

380. *See Understanding Transfer Restrictions for Digital Securities*, Securitize, https://www.securitize.io/thought-leadership/blogs/understanding-transfer-restrictions-for-digital-securities (last visited July 19, 2020).

account basis and will provide for an account system.[381] How this may be achieved in practice remains to be determined.

F. Transaction Hashing

All transactions on blockchain and distributed ledgers are generally hashed to create fixed standard byte sized representations of the executed transaction.[382] This produces an encrypted standard size immutable record of the activity which is one of the primary advantages including with the cryptographic access control.[383] Bitcoin uses the Secure Hash Algorithm (SHA) 2-256, although a large number of other options are available.[384] It is expected that Libra will use the more recent SHA3 which was released by the National Institute of Standards and Technology (NIST) in August 2015.[385]

Transaction hashes are generally held in a Merkle tree for each block within a blockchain with nodes or miners calculating the Merkle root, which is then used to link the blockchains together.[386] Libra states that it will operate on the basis of a consolidated Merkle tree model data structure.[387] Ethereum, for example, uses up a Patricia trie[388] (rather than tree) although it remains to be seen how Libra records will operate in practice.

G. Reconciliation

Digital ledgers require some authentication system which generally uses nodes or validators in place of a centralised trusted third party.[389] This is an aspect of the internalisation of external functions within blockchains on distributed ledgers with the other main issues arising with regard to governance. Authentication and verification will be carried out by the validators within the Libra model.[390] Different models are used for this

381. *See* Libra Ass'n Members, *supra* note 89, at 7.

382. Dylan Yaga, et al., *Blockchain Technology Overview*, at 2, NISTIR 8202, Nat'l. Inst. of Standards & Tech. (Oct. 2018).

383. *See id.*

384. These include, for example, BLAKE/BLAKE 2, COST R, HAVAL, MD 2, 3 4, 5, 6, and RIPEMD and SHA 0, 1, 3, 224, 384, 512/224 and 512/256. *See id.*, at 12.

385. Paul Hernandez, *NIST Releases SHA-3 Cryptographic Standard*, NIST (Aug. 5, 2015), https://www.nist.gov/news-events/news/2015/08/nist-releases-sha-3-cryptographic-hash-standard.

386. *See, e.g.*, Will Kenton, *Merkle Root (Cryptocurrency)*, Investopedia (Apr. 3, 2020), https://www.investopedia.com/terms/m/merkle-root-cryptocurrency.asp.

387. *See* Libra Ass'n Members, *supra* note 89, at 8.

388. *See* Kiyun Kim, *Modified Merkle Patricia Trie—How Ethereum Saves a State*, Medium (June 26, 2018), https://medium.com/codechain/modified-merkle-patricia-trie-how-ethereum-saves-a-state-e6d7555078dd.

389. UK Government Chief Scientific Adviser, *Distributed Ledger Technology: Beyond Block Chain*, Gov't Off. for Sci. GS/16/1 at 17–18 (2016), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf.

390. Amsden et al., *supra* note 119, at 2.

purpose in blockchain and other distributed ledger applications. Bitcoin adopted a revised Proof of Work (PoW) methodology with nodes having to demonstrate an applied amount of computational effort through the production of a hash route number lower than a specified figure.[391] The degree of difficulty is adjusted over time to ensure consistency and a standard block closing time of around ten minutes.[392] On Libra, after transaction execution, validators translate the changes to the logical data model into an authenticated data structure to represent the revised ledger or database.[393] Transactions are to be ordered in accordance with a consensus protocol.[394]

The Libra blockchain was to operate using a series of replicas, or validators, that will maintain a database of programmable resources owned by different user accounts and authenticated using dual public key cryptography with its own consensus scheme. Libra is to use a BFT protocol based on "Hot Stuff" from VMware Research.[395] The Libra BFT consensus mechanism should maintain agreement providing sixty-six percent of network nodes are honest.[396] Libra is expected to move towards Proof-of-Stake (PoS) over time based on token holdings. Transactions are also stated to be "based on predefined and . . . [later], user-defined smart contracts set in the new programming language called Move."[397] Further detail is required.

H. Blocking, Scalability, and Resilience

Blockchains such as Bitcoin operate by having a fixed number of transactions carried out in a pre-determined block size such as with Bitcoin which has an average of 1,609 transactions.[398] Average block size is 0.804 MB with an average block time of 9.231 minutes.[399] Because Bitcoin only processes around seven or eight transactions per second compared to Visa achieving 24,000 transactions per second, significant scalability issues arise.[400] The block is closed with a Merkle tree root being calculated which is then used to form the header for the next block.[401] Blocks are then

391. *Proof of Work*, BitcoinWiki, https://en.bitcoin.it/wiki/Proof_of_work (last visited July 20, 2020).
392. *Difficulty*, BitcoinWiki, https://en.bitcoin.it/wiki/Difficulty (last visited July 20, 2020).
393. Amsden, et al., *supra* note 119, at 12.
394. *Id.* at 17.
395. Maofan Yin, *HotStuff: BFT Consensus in the Lens of Blockchain*, VMWare (Mar. 2018), https://arxiv.org/pdf/1803.05069.pdf.
396. Dimitrov, *supra* note 358.
397. Amsden, et al., *supra* note 119, at 1.
398. Patrick Thomson, *The Current State of the Bitcoin Network and its Biggest Block*, CoinTelegraph (Sept. 26, 2018), https://www.google.com/amp/s/cointelegraph/.com/news/the-current-state-of the-becoming-network-and-its-biggest-block/amp.
399. *Id.*
400. *Id.*
401. All of the transactions within a block are hashed in pairs and then re-hashed in rows of "branches" (with any single hash being hashed with itself) until this produces a single Merkle

collected together in a sequential chronological order.[402] This creates security and immutability, although the size of the ledger necessarily increases substantially over time with Bitcoin now being over 242 GB.[403] This limits portability and accessibility with many users having to access the blockchain through third-party service providers. Blockchains accordingly suffer from core scalability issues within the block structure although these may be dealt with through using an off-chain "Lightning Network" with Bitcoin[404] or alternatively by using graph technology such as Directed Acyclic Graphs (DAGs).[405] Libra claims to be able to process 1,000 transactions per second with ten second intervals between transactions although further detail is required.[406]

I. WALLET PROVISION

Libra has confirmed that personal wallets will be made available through the separate Facebook subsidiary, Novi, with other services following.[407] The open source code should allow other nodes to be used in addition to Novi.[408] Digital wallets are generally provided to store electronic keys rather than funds directly with digital coins remaining on the underlying blockchain. It is expected that Libra will use cryptographic access controls with a slightly different elliptic curve in the same manner as a Bitcoin.[409] It is nevertheless unclear whether Libra will use a separate blockchain and create a distinct digital coin.[410] It is expected that the proposed new Chinese Digital Currency Electronic Payment System (DCEP) will use a form of

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root hash. *See Protocol Documentation*, BITCOINWIKI, https://en.bitcoin.it/wiki/protocol_documentation#merkle_trees (last visited July 20, 2020).

402. Thomson, *supra* note 398; Nikolai Kuznetsov, *SegWit, Explained*, COINTELEGRAPH (Sept. 28, 2019), https://cointelegraph.com/explained/segwit-explained.

403. Shanhong Liu, *Bitcoin Blockchain Size 2010-2020, by Quarter*, STATISTA.COM (Jun. 10, 2020), https://www.statista.com/statistics/647523/worldwide-bitcoin-blockchain-size/.

404. *What Is Lightning Network and How it Works*, COINTELEGRAPH, https://cointelegraph.com/lightning-network-101/what-is-lightning-network-and-how-it-works (last visited July 14, 2020).

405. Blockchain may be replaced by graph technology, including Directed Acyclic Graphs (DAGs), due to the inherent limitations of scale that arise. DAGs allow for multiple transaction chains rather than consecutive size restricted blockchains. DAGs are used by such coins as IOTA and Dagcoin. *See* Fantom Foundation, *An Introduction to DAGs and How They Differ from Blockchains*, MEDIUM.COM (Jun. 20, 2018), https://medium.com/fantamfoundation/an-introduction-to-dags-and-how-they-differ-from-blockchains-a6f703462090; *see also Directed Acyclic Graphs*, BITCOINWIKI, https://en.bitcoinwiki.org/wiki/ directed_acyclic_graphs_(dags) (last visited July 20, 2020).

406. Dimitrov, *supra* note 358.

407. *See* discussion *supra* Section II.C.

408. Dimitrov, *supra* note 358.

409. Wolf, *supra* note 162.

410. *See* discussion *supra* Section VI.B, VI.E.

digital monetary value rather than a separate digital coin.[411] The use of the wallets then remains unclear. It is possible that the wallets will be used as a form of separate account management device that holds or displays credit balances. It remains to be seen how this will operate in practice.

J. Interoperability and Smart Contract Function

It is unclear to what extent Libra will be able to connect with other systems even though this appears to be one of the objectives of the scheme. Blockchains can, for example, use "atomic swaps"[412] or "hyperledgers."[413] These operate by creating temporary escrow accounts on separate blockchains with values being credited and debited on a temporary basis and then transferred or switched in the event of the trigger conditions being satisfied.[414] The effect is to transfer values across separate blockchains. This is atomistic in that if the relevant trigger conditions are not satisfied, all debit and credit balances are restored to their original positions with the escrow accounts being closed.[415]

It was announced that Libra would include smart contract functionality, although the details were unclear. Rather than launch a competing coin, other operators such as Google have been focusing on its mobile payment platform, Google Pay, and developing smart contract functionality.[416] Google had originally set up a Google Wallet as a peer-to-peer payments service, which was later renamed Google Pay Send and then integrated into Google Pay.[417] Google Pay began as Android Pay in September 2015[418] and was renamed Google Pay in January 2018.[419] Google incorporated blockchain data in its BigQuery data analytics platform and then connected this with Chainlink and its oracle function to support on-chain smart

411. *See* Wolfie Zhao, *China's Digital Fiat Wants to Compete with Bitcoin – But It's Not a Crypto*, *Coindesk* (Aug. 16, 2019), https://www.coindesk.com/is-chinas-digital-fiat-a-cryptocurrency-heres-what-we-know.

412. Alex Min, *Atomic Swaps Explained*, Liquality, https://liquality.io/blog/atomic-swaps-explained/ (last visited Aug. 11, 2020).

413. *About Hyperledger*, Linux Found., https://www.hyperledger.org/about (last visited Aug. 11, 2020).

414. Min, *supra* note 412.

415. *Id.*

416. Hank Tucker, *Google Integrates Cryptocurrency Project with New Smart Contract Tool*, Forbes, (Jun. 13, 2019), https://www.forbes.com/sites/hanktucker/2019/06/13/google-integrates-cryptocurrency-project-with-new-blockchain-oracle/#44696bd261dd.

417. *Id.*

418. Samuel Gibbs, *Google Launches Android Pay to Take over Where Google Wallet Failed*, Guardian (Mar. 2, 2015, 12:54 PM), https://www.theguardian.com/technology/2015/mar/02/google-launches-android-pay-take-over-where-google-wallet-failed.

419. Pali Bhat, *Bringing it all Together with Google Pay*, Google: The Keyword (Jan. 8, 2018), https://blog.google/topics/shopping-payments/announcing-google-pay/.

contract execution.[420] While digital tokens may only represent ten percent of blockchain's future business potential, ninety percent was estimated to be in smart contracts.[421] Only ten to twenty percent of digital contracts involved an exchange for value with the balance having to be managed through smart contracts.[422] Google had developed a partnership relationship with Chainlink to capture the potential of smart contracts.[423] Libra has claimed that it will operate with smart contracts, although further information is required.

K. CODE

The Libra programming language is referred to as Move.[424] This is described as creating a safe and programmable foundation for the Libra blockchain.[425] Move language is an executable byte code language in contrast to Ethereum's Solidity which is a higher-level language.[426] Move is directly executable on the Virtual Machine (VM) with Solidity having to be pre-compiled on the Ethereum Virtual Machine (EVM).[427] Transactions submitted to the Libra blockchain are stated to use a transaction script written in Move to encode the logic.[428] This is referred to as an executable byte code language that implements custom transactions and smart contracts.[429]

L. GOVERNANCE

Effective governance arrangements must be established. Many digital coin and token models have suffered from defective decision taking and dispute resolution mechanisms which can create significant delays and disruption as has occurred with Bitcoin.[430] The Tezos digital coin, for example, was established to create a new more effective and adjustable

420. Allen Day, *Building Hybrid Blockchain/Cloud Applications with Ethereum and Google Cloud*, GOOGLE (June 13, 2019), https://cloud.google.com/blog/products/data-analytics/building-hybrid-blockchain-cloud-applications-with-ethereum-and-google-cloud.

421. Darryn Pollock, *Is Google Chasing the 90% Potential of Blockchain that Facebook Left out?*, FORBES, (July 2, 2019), https://www.forbes.com/sites/darrynpollock/2019/07/02/is-google-chasing-the-90-potential-of-blockchain-that-facebook-left-out/#466afb653185.

422. *Id.*

423. Chainlink provided an oracle service to integrate external data into own getting started with mover-chain smart contracts. *Id.*

424. Amsden et al., *supra* note 119, at 10–12.

425. *Getting Started with Move*, LIBRA, https://developers.libra.org/docs/move-overview (last visited July 20, 2020).

426. Blackshear, et al., *supra* note 124.

427. Dimitrov, *supra* note 358.

428. *Id.*

429. The technical paper states that Move defines custom resource types which can never be copied or discarded but only moved between program storage locations to protect the integrity of the system. Amsden et al., *supra* note 119, at 10-12.

430. *Difficulty*, *supra* note 392.

governance model although substantial disputes immediately arose which significantly held up the programming and development process.[431]

Libra was to use between twenty-eight and one-hundred validators initially which would become members and subscribers to the Libra Association.[432] These are large professional institutions subject to minimum capital and customer base sizes.[433] Facebook has stated that it will only have one vote in parity with other members.[434] It was expected that Facebook may continue to dominate Libra's technical development even with the one member vote system.[435] Libra could result in a Facebook dominated "mono-bank."[436] Difficulties may also arise if Libra adopts a fully open and permissionless system with an unlimited number of validators that each have an equal vote.[437] This should be reviewed further over time.

Sound governance arrangements must be established that manage all relevant risks including those involving separate intermediaries or third-party service providers.[438] Rights and assets must be protected, including in relation to distributed ledgers, although overly complex or inefficient governance structures should be avoided that would delay or obstruct decision-taking.[439]

VII. Libra Policy Issues and Comment

Several larger policy issues also arise that have to be resolved in relation to the expansion of BigTech into the financial services area and with the growth in StableTech. These are principally concerned with the size and dominance of BigTech firms and the distortive impact that could arise if they move into

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431. Tezos was set up to correct earlier governance difficulties through the creation of a new social consensus model with core development involvement and the decentralization of network maintenance using modular structures and a stakeholder ("baking") voting process. *See* Martin B., *Tezos: A Self-Amending Meta-Protocol for On-Chain Governance – Deep-Dive*, COINSPACE (Aug 27, 2019), https://coinspace.com/news/altcoin-news/tezos-self-amending-meta-protocol-chain-governance-deep-dive. A dispute nevertheless arose between the founders, Arthur and Kathleen Breitman, who controlled the software and the Tezos foundation Chairman, Johann Gevers, which held the proceeds of the $232 million Initial Coin Offering (ICO) which had been held in July 2017. While this dispute was resolved, separate class actions and a regulatory investigation was commenced on the basis that Tezos constituted a security rather than a donation token. *See* Mike Dalton, *Tezos' Federal Lawsuit Is Still Ongoing, Community Lawyer Says*, CRYPTOBRIEFING (Nov. 29, 2019), https://cryptobriefing.com/tezos-federal-lawsuit-ongoing/.

432. Amsden et al., *supra* note 119, at 6–7.

433. *Id.*

434. Constine, *supra* note 90.

435. *See* Wolf, *supra* note 162. Facebook was been described as being "grossly irresponsible over its impact on our democracies" and cannot "obviously be trusted with our payment systems." *Id.*

436. *Id.*

437. *See* Libra Ass'n Members, *supra* note 89, at 42.

438. G7 Working Group on Stablecoins, *supra* note 19, at 8–9.

439. *Id.* at 15.

credit provision with consequential damage to domestic monetary policy control.[440] International monetary concerns also arise due to the size of the firms in relation to many economies.[441] Separate problems have to be assessed in connection with digital taxation, consumer protection, financial integrity and financial stability.[442]

Business and regulatory fragmentation problems can be created which require the development of new cross-border supervisory and regulatory solutions. Technological challenges have to be resolved and an appropriate policy balance secured between innovation, competition and financial stability. Relevant issues are considered in further turn below.

A. Market Power and Competition Policy

While the entry of new competition is generally supported in markets to discipline incumbent institutions, large technology firms have inherent competitive advantages due to their access to large existing data pools that can quickly allow them to acquire dominant positions that would limit rather than increase competition.[443] This can make markets less contestable and efficient with technology firms being able to leverage their dominance specifically in search, social networking, or ecommerce areas.[444] Earlier indicia of contestability, such as the existence of a single market, firm size, pricing, and concentration, become of less relevance in technology and data driven markets.[445] As multi-sided platforms (MSPs) firms can use one activity to subsidise another to build up market penetration and consequently create a captive user base, the largest firms can then become dominant in many international markets and across many areas of activity.[446]

Specific concerns arise with regard to market power and dominance as powerful BigTech companies move into specialist financial markets and compete with relatively smaller incumbent institutions. BigTech firms benefit from large data pools that create "digital monopolies" or "dataopolies."[447] Large technology companies can acquire massive amounts of data at almost zero cost that can allow them to engage in price discrimination and rental extraction.[448] Brand loyalty creates captive markets with technology companies being able to acquire dominant positions in a short period of time.[449] They can then abuse their market power with price increases, the imposition of switching costs on users, excluding competitors through the erection of market barriers, or buying up and absorbing

440. *Id.*
441. *Id.* at 2.
442. *Id.* at 1.
443. *See* 2019 BIS Ann. Rep., *supra* note 4.
444. *Id.* at 73.
445. *Id.*
446. *Id.* at 63.
447. *Id.* at 67.
448. *Id.*
449. *Id.* at 73.

potential rival platforms.[450] They can also engage in price discrimination, product bundling, or cross-subsidisation.[451]

Firms must compete under equal market conditions. Technology companies nevertheless have an inherent advantage with their embedded data pools which are acquired at almost zero cost.[452] Data is non-rivalrous in that it can be used by many firms without a loss of quality of content or value.[453] Banks and financial firms have been required to share their data under, for example, the European Payment Services Directive[454] and the Open Banking Initiative,[455] which allows customers to provide third party service providers access to their data held with the financial institution concerned. The objective is to improve data mobility and increase competition within banking and financial markets.[456] Issues nevertheless arise to what extent large technology firms are subject to equal data access obligations and a proper level playing field has been created between BigTech, incumbent operators and new FinTech operators.[457] The DNA feedback loop referred to would allow large technology firms to acquire a substantial competitive advantage over incumbent institutions.[458] Equal data access rights have to be provided or appropriate limits imposed on data use.

The G7 notes that competition policy is intended to promote innovation and efficiency in markets although GSCs could create difficulties where competition led to significant market concentration.[459] Market dominance may arise from network effects, committed fixed costs, or data access with proprietary systems acting as barriers to entry.[460] The G7 published a separate *Common Understanding of G7 Competition Authorities on Competition and the Digital Economy* in June 2019.[461] The G7 Competition Authorities[462]

450. *Id.* at 67.

451. *Id.*

452. *Id.* at 67.

453. *Id.* at 74.

454. Directive 2015/2366, 2015 O.J. (L 337).

455. *See generally*, Open Banking Working Group, *Open Banking Standard Framework*, OPEN DATA INST. (2015), http://theodi.org/wp-content/uploads/2020/03/298569302-The-Open-Banking-Standard-1.pdf.

456. *Id.* at 2.1.

457. Carmen Álvarez, *From Fintech to Big Tech: In Search of the New Digital Regulation*, BBVA, https://www.bbva.com/en/from-fintech-to-big-tech-in-search-of-the-new-digital-regulation/ (last visited July 28, 2020).

458. *2019 BIS Ann. Rep.*, *supra* note 4, at 73.

459. G7 Working Group on Stablecoins, *supra* note 19, at 11.

460. *Id.* at 12.

461. G7 France, *Common Understanding of G7 Competition Authorities on "Competition and the Digital Economy"*, 1 (June 5, 2019), https://www.ftc.gov/system/files/attachments/press-releases/ftc-chairman-supports-common-understanding-g7-competition-authorities-competition-digital-economy/g7_common_understanding_7-5-19.pdf?utm_source=govdelivery.

462. The G7 competition authorities are: Autoritá Garante della Concorrenza e delMercato (Italy), Autorité de la Concurrence (France), Bundeskartellamt (Germany), Competition Bureau (Canada), Competition and Markets Authority (United Kingdom), Department of Justice

agreed that competitive markets were key to well-functioning economies,[463] competition law was flexible,[464] governments should determine whether policies or regulations unnecessarily restrict competition in digital markets,[465] greater international cooperation and convergence should be promoted,[466] and competition and interoperability should be facilitated between payment systems.[467]

Accordingly, a new set of competition and dominant position tests have to be developed to facilitate a more accurate assessment of market power in new technology and data driven markets, especially in global and technology-based sectors.[468] This applies equally to cartels, dominant positions, and merger control. Cross-border effects and cross-industry or cross-sector impacts specifically have to be considered. It is essential that a more complete global assessment be undertaken and a coordinated response constructed to ensure that all firms compete on a level playing field.

B. Market Integrity and Credit Policy

It is necessary to protect market integrity and ensure that value and price formation is fair and transparent.[469] Specific concerns arise with regard to residual volatility in stablecoin prices depending upon the specific primary and secondary stabilisation techniques applied. Further issues may arise with regard to market abuse and front running on basket assets. Other instances of misinformation, market manipulation, or conflicts of interest can arise in relation to collateral asset management.[470]

(United States), Directorate General for Competition (European Commission), Federal Trade Commission (United States), and Japan Fair Trade Commission (Japan). *Id.* at 1.

463. The digital economy had transformed goods and services markets which had allowed industry restructuring, investment and innovation, consumer transparency, new business opportunities, and reduced costs. Data driven innovations had transformed the digital economy and supported the development of algorithms and artificial intelligence. *See id.* at 1–3.

464. Competition authorities had to ensure that relevant tools, resources, and skills were capable of applying to new digital economy challenges. Direct and indirect significant network effects and economies of scale and scope could generate concentration and entry barriers with concerns also arising with regard to digital data accumulation. Competition law had to continue to be applied in a flexible analytical, fact based, cross-sector and technology neutral manner using traditional ideas of market definition, market power and abuse. All necessary information had to be collected using existing powers and new business models assessed appropriately. *See id.* 4–7.

465. Competition authorities should work with other agencies to ensure that policies were applied in a consistent and supportive manner with pro-competitive alternatives being used where appropriate. *See id.* 7–8.

466. National competition authorities should work with other authorities to develop common understanding and promote cross-border cooperation, in particular, on the investigation and detection of anticompetitive behavior and abusive concentration. *See id.* 8–9.

467. G7 Working Group on Stablecoins, *supra* note 19, at 11.

468. G7 France, *supra* note 461, at 4–6.

469. *Id.* at 62.

470. *Id.*

As technology firms expand into financial services, they generally follow a business model that moves from payment into savings and investment, insurance, and credit provision.[471] This process is generally carried out indirectly in cooperation with incumbent institutions until direct proprietary market positions can be carved out.[472] Facebook has stated that it does not intend to obtain banking licenses for the Libra Association in separate countries to conduct lending activities, although this may be reviewed over time.[473]

Technology firms can enjoy inherent market advantages in terms of improved credit assessment and credit inclusion, as well as subsequent loan monitoring without high collateral costs.[474] Ex ante and ex post benefits arise.[475] Continuing information access and low data collection costs make it cheaper and more efficient for technology firms to conduct initial credit assessments.[476] They may specifically be able to lend to borrowers that would otherwise be excluded by banks, in particular, due to the unavailability of required documentation or through geographical obstacles.[477] Credit scoring can be of a higher standard within BigTech firms.[478] They can also benefit from data analytics and artificial intelligence (AI).[479] Monitoring costs can be cheaper with lower margins being available and with less or no collateral required.[480] Enforcement and debt management is improved as technology firms have access to client continuing credit lines and can make deductions and secure discipline through the threat of platform downgrades or exclusion.[481]

Major technology firms' financial services income generally only represent around eleven percent of their annual totals as against forty-six percent generated through information technology and consulting including cloud computing and data analysis.[482] BigTech and FinTech credit provision is still relatively small in relation to total credit supply representing only around 0.5 percent of the total global stock in 2017.[483] Rates are nevertheless much higher in certain countries such as China.[484] It has to be expected that these

471. Frost, et al., *supra* note 4.
472. 2019 BIS Ann. Rep., *supra* note 4, at 57–58.
473. Facebook has stated that it is in the process of filing for a payment systems license with the Swiss Financial Market Supervisory Authority (FINMA), rather than banking licenses in individual countries. Libra Ass'n Members, *supra* note 89.
474. 2019 BIS Ann. Rep., *supra* note 4, at 66.
475. *Id.* at 64, 79 n. 24.
476. *See id.* at 65.
477. *See id.* at 64–65.
478. *See id.* at 65.
479. Credit scoring of small vendors can outperform credit bureau ratings and traditional borrower models. *See id.*
480. *See id.* at 64.
481. *See id.* at 67.
482. 2019 BIS Ann. Rep., *supra* note 4, at 56.
483. Frost et al., *supra* note 4, at 8.
484. *Id.* at 26.

figures may increase over time, assuming that the technology firms can acquire the necessary banking or lending licences.

If new market entrants, such as the Libra Association, can provide substantial payment and savings services as well as build up significant lending portfolios, they could substantially damage incumbent banking markets in many countries. Banks may initially lose access to traditional sources of savings and deposit which would compel them to borrow from other institutions or capital markets. This could also have stability implications to the extent that their relative deposit bases were smaller with increased pressure placed on interbank markets and ultimately central bank support facilities. Incumbent institutions would then be further damaged to the extent that technology firms provide lending services as well. This could result in substantial market restructuring in many countries. This would have the consequential effect of undermining the ability of banks to carry out their traditional credit assessment process although this may be more efficient and accurate using new technology as noted.[485] All of this has to be reviewed.

C. Monetary Policy

The conduct of domestic monetary policy could be damaged especially where technology companies, such as the Libra Association, are based abroad and owned by overseas institutions. The volume and cost of the domestic money supply is generally controlled through managing interest rates on the primary money markets made up of the largest commercial banks and the central bank.[486] Interest rates impact the creation of credit by banks.[487] The increased use of such digital coins as Libra could, as referred to, materially reduce bank deposit volumes and force them to borrow elsewhere including in interbank markets and from the central bank at the same time as reduce the earnings and competitive positions of banks in lending markets. Commentators have warned that Libra could result in

485. *See* Stephen O'Neal, *Libra Seen as Threat to National Currency Sovereignty, Pleads With G-7*, Cointelegraph (Sept. 19, 2019), https://cointelegraph.com/news/libra-seen-as-threat-to-national-currency-sovereignty-pleads-with-g-7.

486. *How Central Banks Affect Interest Rates*, Investopedia (July 3, 2020), https://www.investopedia.com/ask/answers/031115/how-do-central-banks-impact-interest-rates-economy.asp.

487. *See, e.g., id.*

significant inflation in developing countries.[488] Others have referred to the risk of substantial instability.[489]

Globally managed digital currencies such as Libra may be used to lend at the most effective international rates which would remove interest rate controls from domestic central banks and possibly destroy their ability to conduct meaningful local monetary policy. Providing funds at low international rates may be attractive in certain countries although other territories may not wish to surrender domestic monetary control. Solutions may still be available, for example, by requiring that floor interest rates were set in accordance with local central bank targets or guidance or by requiring that lending funds were sourced from domestic inter-bank and capital markets. This is a complex and difficult issue the full implications of which have to be examined in further detail.

The G7 notes that the impact of GSCs on monetary policy transmission will be dependent on the use of the stablecoin as a means of payment, store of value or unit of account, and the stability mechanism adopted.[490] Domestic monetary policy management may be weakened where GSCs were used as a widely held store of value and, in particular, where a currency basket was used and the domestic currency was not included as a reserve asset. Currency substitution could result in the loss of seigniorage revenue and reduced monetary sovereignty. Domestic currency deposit volumes may fall with an increased dependence on bank wholesale funding. A further loss in monetary control could arise through alternative credit creation with lending being conducted in GSCs.[491]

While the Libra Association has stated that it does not intend to provide lending facilities initially, this may be reconsidered and lending in Libra could be undertaken by other parties.[492] The effect could be to significantly increase the domestic money supply in specific territories.[493] Libra could be "dollarized" and replace domestic currencies for payment, invoicing and

488. For example, Alexander Lipton has stated that "[i]n developing countries, it will cause enormous inflation because the amount of money will be kind of doubled, roughly speaking, in fact much more than doubled. . . I am not a big fan of quantity theory of money, but I am absolutely certain that as the amount of money explodes, prices will go up." Max Boddy, *MIT Fellow and NYU Math Professor Says Libra Copied off Co-Authored Paper*, COINTELEGRAPH (July 26, 2019), https://cointelegraph.com/news/mit-fellow-and-nyu-math-professor-says-libra-copied-off-co-authored-paper.

489. For example, Martin Wolf argues that Facebook could create its own global banking ecosystem and Libra could lead to potential monetary and financial instability, concentrated economic and political power and lack of privacy. Wolf, *supra* note 162. This could result in a global bank managing its own currency not backed or controlled by any central bank and without any principal regulator and could create a "nightmarish risk to stability." *Id.*

490. G7 Working Group on Stablecoins, *supra* note 19, at 15.

491. *Id.*

492. Caitlin Long, *Facebook's Cryptocurrency, Libra: Senate Banking Testimony*, FORBES (July 15, 2019), https://www.forbes.com/sites/caitlinlong/2019/07/15/facebooks-cryptocurrency-libra-senate-banking-testimony/#5b3e9aa11378.

493. Martin Sandbu, *Don't Let Facebook Capture the Monetary System*, FIN. TIMES, https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12243385.

accounting purposes.[494] Libra could then be used to "privatise the monetary system."[495] Libra could deny domestic banks access to traditional deposit funds. This could specifically occur where funds were exchanged for Libra and Libra deposited with local central banks as reserve account facilities are opened up.[496] The market position of domestic commercial banks could consequently be substantially damaged both in terms of loss of income from payments and lending and additionally by the diminishment of their historical role as credit providers.[497] This may further impair monetary policy transmission especially through control over domestic interest rates on commercial bank positions. Libra availability could separately distort liquidity positions and ECB monetary control over the Euro could be specifically impacted.[498] This could undermine the foreign exchange stability of currencies, especially where they may or may not be included within the Libra Reserve basket.[499]

The availability of Libra places substantial pressure on central banks to reconsider issuing their own central bank digital currency (CBDC).[500] This could substantially undermine the attractiveness and value of Libra.[501] A number of central banks have been considering the desirability of issuing CBDC.[502] It was expected that the Swedish Riksbank may be the first to issue official CBDC, in particular, in 2018 which represented the 350th anniversary since the establishment as the *Riksens Ständers Bank* (Estates of the Realm Bank).[503] It is now possible that the People's Bank of China will

494. *Id.*

495. *Id.*

496. *See* Wolf, *supra* note 162.

497. *See id.*

498. *See* Yves Mersch, Member, Exec. Bd. of the Eur. Cent. Bank, Speech at the ECB Legal Conference (Sept. 2, 2019), *in Money and Private Currencies: Reflections on Libra*, EUR. CENT. BANK, https://www.ecb.europa.eu/press/key/date/2019/html/ecb.sp190902~aedded9219.en.html (last visited Aug. 9, 2020).

499. *See id.*

500. Danny Nelson, *CBDC Issuance Is 'Not a Reaction' to Libra, Says Central Bank Body*, COINDESK (June 25, 2020), https://www.coindesk.com/cbdc-issuance-is-not-a-reaction-to-libra-says-central-bank-body.

501. Sandbu, *supra* note 493.

502. *See, e.g.*, *Digital Currencies and FinTech*, BANK OF CANADA, https://www.bankofcanada.ca/research/digital-currencies-and-fintech/ (last visited July 27, 2020); *Central Bank Digital Currencies*, BANK OF ENG. (Apr. 8, 2020), https://www.bankofengland.co.uk/research/digital-currencies; Governor Stefan Ingves, Speech Before the Swedish House of Finance, Stockholm (Dec. 8, 2017), *in Ingves: Do We Need an E-Krona?*, SVERIGES RIKSBANK (Jan. 4, 2018), https://www.riksbank.se/en-gb/press-and-published/speeches-and-presentations/2017/ingves-do-we-need-an-e-krona/. *See also*, Yves Mersch, Member, Exec. Bd. of the Eur. Cent. Bank, , Speech at the Farewell ceremony for Pentti Hakkarainen, (Jan. 16, 2017), *in Digital Bases Money: An Assessment from the ECB's Perspective*, EUR. CENT. BANK, https://www.ecb.europa.eu/press/key/date/2017/html/sp170116.en.html (last visited Aug. 9, 2020); Yao Qian, *Digital Currency and Central Bank Accounts*, TSINGHUA FIN. REV. (Apr. 26, 2017), https://mp.weixin.qq.com/s/H0wDjzUL2Nn6mU42e2Dk8Q?.

503. *The Riksbank's 350th Anniversary*, SVERIGES RIKSBANK (Jan. 26, 2019), https://www.riksbank.se/en-gb/about-the-riksbank/history/the-Riksbanks-350th-anniversary/.

launch the first CBDC as part of a combined Digital Currency and Electronic Payment (DCEP) model with CBDC producing the digital monetary unit and then working with existing commercial bank and payment infrastructure in its distribution.[504] It may be that national authorities attempt to delay the authorisation of Libra to allow them to issue their own CBDC, but many would not be in a position to do so without the available technology. A number of separate papers have been issued on the monetary and economic implications of CBDC.[505] The introduction of CBDC[506] may specifically assist rather than undermine the conduct of monetary policy.[507] The imminent availability of Libra may now distort other CBDC planning and timing decisions.

D. Monetary Stability Policy

Monetary stability may be impacted depending upon the effects of GSCs on capital mobility and cross-border payment.[508] This may increase capital

504. Zhao, *supra* note 411.

505. George Danezis & Sarah Meiklejohn, *Centrally Banked Cryptocurrencies* Arvix (May 26, 2016), https://arxiv.org/pdf/1505.06895.pdf; Evangelos Benos, et al., *The Economics of Distributed Ledger Technology for Securities Settlement*, (Bank of Eng., Staff Working Paper No. 670, Aug. 2017); Juan Antonio Ketterer & Gabriela Andrade, *Digital Central Bank Money and the Unbundling of the Banking Function*, (Inter-American Development Bank, Discussion Paper No. IDB-DP-449, Apr. 2016); John Barrdear & Michael Kumhof, *The Macroeconomics of Central Bank Issued Digital Currencies*, (Bank of Eng., Staff Working Paper No. 605, July 2016) (using a large scale DSGE model to examine the impact of CBDC and government bond purchases on domestic GDP); Michael D. Bordo & Andrew T. Levin, *Central Bank Digital Currency and the Future of Monetary Policy*, (NBER Working Paper No. 23711, Aug. 2017) (on the transformation and conduct of monetary policy); Olga Cerqueira Gouveia, et al., *Central Bank Digital Currencies: Assessing Implementation Possibilities and Impacts*, (BBVA Working Paper No. 17/04, Mar. 2017); Jack Meaning, et al., *Broadening Narrow Money: Monetary Policy with a Central Bank Digital Currency*, (Bank of Eng., Staff Working Paper No. 724, May 18, 2018).

506. CBDC can be defined as "any electronic, fiat liability of a central bank that can be used to settle payments, or as a store of value." Ben Dyson & Jack Meaning, *Would a Central Bank Digital Currency Disrupt Monetary Policy*, Bank Underground (May 30, 2018), https://bankunderground.co.uk/2018/05/30/would-a-central-bank-digital-currency-disrupt-monetary-policy/#:~:text=we%20define%20CBDC%20in%20general,monetary%20policy%20and%20financial%20stability. The use of digital coin (referred to as "e-cash") is considered separately where this would be issued at a zero-interest rate and be freely convertible into other central bank liabilities including reserve assets with the CBDC being perfectly elastic. Meaning, et al., *supra* note 505, at 2–3. The paper notes that demand for e-cash may change with other interest rates which creates counter-cyclical demand between deposits and e-cash which could affect bank liquidity and create instability within the banking sector 27, 28. *Id.* This is on the assumption that the CBDC is account (rather than digital coin) based, universally accessible on a central bank balance sheet and interest bearing. *Id.*

507. *See generally* Marvin Goodfriend, *The Case for Unencumbering Interest Rate Policy at the Zero Lower Bound*, Fed. Res. Bank of Kan. City Eco. Pol'y Symp., Jackson Hole, (2016) 127-160, https://www.kansascityfed.org/~/media/files/publicat/sympos/2016/2016goodfriend.pdf?la=EN. *See also* Paolo Boel, *Thinking About the Future of Money and Potential Implications for Central Banks Economic Review*, Sveriges Riksbank Econ. Rev. 147 (2016).

508. G7 Working Group on Stablecoins, *supra* note 19, at 15.

movements and substitutability between domestic and foreign assets which would reduce local monetary control.[509] Exchange rate effects could be reduced where a GSC was used as a unit of account in international trade and transactions invoiced in the GSC. Longer term capital flows could be impacted depending upon whether currencies were or were not included in the GSC reserve basket with open market operations being hindered in capital outflow countries not included.[510]

Other issues may arise at the international level which may impact on the ability of the International Monetary Fund (IMF)[511] to carry out its monitoring and surveillance roles. The IMF would specifically have to oversee the impact of the use of a global currency such as Libra on domestic monetary conditions in specific countries as well as the stability of the wider international financial system.[512] It would specifically have to monitor payment flows and capital movements. Domestic monetary arrangements must be notified to the IMF under Article IV sections 1 and 2.[513] It could be argued that the IMF should reconsider its Articles of Agreement to ensure that it has all necessary powers to intervene in the event of foreign currencies instability arising as a result of Bitcoin or other decentralised digital currencies such as Libra.[514]

Some writers have argued that the IMF should assume responsibility for Libra[515] and that people would place more confidence in Libra if it was managed by the IMF.[516] Another option would be for the IMF to create a form of digital or synthetic special Drawing Right (DSDR or SSDR). The

509. *Id.*

510. *Id.*

511. The purposes of the IMF are: (1) to promote international monetary cooperation; (2) to facilitate the expansion and balance growth of international trade; (3) to promote exchange stability, maintain orderly exchange arrangements and avoid competitive exchange depreciation; (4) to assist an establishment of a multilateral system of payments for current transaction; (5) to provide financial support to correct maladjustments in balance of payments and avoid destructive measures; and (6) to reduce the duration and degree of disequilibrium in international payment balances. *See* Articles of Agreement of the IMF art I, 60 Stat. 1401, 2 U.N.T.S. 39.

512. *See id.*

513. Countries are required to collaborate with the IMF and other members to ensure orderly exchange arrangements and to promote a stable system of exchange rates. *Id.* at 5. Countries are to notify the IMF of the exchange arrangements to be adopted which may include a peg, cooperative arrangements or other exchange arrangements. *Id.* at 6. The IMF may impose an exchange arrangement on an eighty-five percent majority basis without limiting the right of members to determine their own arrangements. *Id. See also* Zetzsche, *supra* note 3.

514. *See* Nicholas A. Plassara, *Regulating Digital Currencies: Bringing Bitcoin within the Reach of the IMF*, 14 CHI. J. INT'L L. 377 (2013).

515. Yanis Varoufakis, *The IMF Should Take Over Libra*, PROJECT SYNDICATE (Oct. 18, 2019), https://www.project-syndicate.org/commentary/international-monetary-fund-should-take-over-facebook-libra-by-yanis-varoufakis-2019-10?barrier=accesspaylog.

516. Marie Huillet, *Former PBoC Governor: Libra Would Be Trusted If Run by IMF*, COINTELEGRAPH (Nov. 8, 2019), https://cointelegraph.com/news/former-pboc-governor-libra-would-be-trusted-if-run-by-imf.

SSDR originally was originally introduced in 1969 to act as a claim on the freely usable currencies of IMF members to provide additional liquidity in international finance.[517] Former Bank of England Governor, Mark Carney, has recommended that central banks consider setting up a form of collective Synthetic Hegemonic Currency (SHC) based on a basket of currencies.[518]

E. Digital Taxation Policy

Libra's tax treatment will be essential to its longer-term successful development and use. Authorities can support or delay the market uptake of Libra through short or longer-term adjustments in tax policy. An important component of this may be agreeing common tax treatment rules on BigTech firms such as through the G20 and OECD. Tax liability and rates can also be revised over time depending upon authorities' changing opinions or expectations as to Libra's market and social value.

Difficulties arise in determining the proper tax status of stablecoins for domestic tax treatment as well as in the possible use of coins for tax avoidance purposes especially where owner anonymity is available.[519] Cryptocurrencies are generally treated as property for tax purposes.[520] They are subject to capital gains tax at the relevant rate.[521] Currency gains can be taxed at income tax rates.[522] Bitcoin and commodity futures, including

517. *See* Graham Smith, *IMF Has Another Trick Up Its Sleeve When Fiat Fails - Its Own Coin SDR*, Bitcoin.com (Oct. 14, 2019), https://news.bitcoin.com/imf-has-another-trick-up-its-sleeve-when-fiat-fails-its-own-coin-sdr/.

518. Carney, *supra* note 187.

519. G7 Working Group on Stablecoins, *supra* note 19, at 11.

520. The UK HMRC defines cryptoassets as "cryptographically secured digital representations of value or contractual rights that can be transferred, stored or traded electronically." While all cryptoassets use DLT not all DLT involves cryptoassets. *Cryptoassets: Tax for Individuals*, HM Revenue & Customs (Dec. 20, 2019) (UK), https://www.gov.uk/government/publications/tax-on-cryptoassets/cryptoassets-for-individuals#:~:text=financial%20trading%20in%20cryptoassets,the%20person%20holding%20it%20does.&text=only%20in%20exceptional%20circumstances%20would,a%20financial%20trade%20in%20itself. The HMRC adopts the taxonomy developed by the Cryptoasset Taskforce in the UK which distinguishes between exchange, utility and security tokens. *Id.* The U.S. IRS defines a virtual currency as "a digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value." I.R.S. Notice 2014-21.

521. UK individuals pay capital gains tax of ten percent within the basic Income Tax band (eighteen percent on residential property) or twenty percent (twenty-eight percent on residential property) above the basic rate. *Capital Gains Tax*, GOV.UK, https://www.gov.uk/capital-gains-tax/print (last visited Aug. 10, 2020). The U.S. IRS generally imposes a capital gains tax of fifteen percent and twenty percent for individuals earning more than $425,800 (or $479,000 for married couples). *Topic No. 209 Capital Gains and Losses*, IRS.gov (May 27, 2020), https://www.irs.gov/taxtopics/tc409. Gold is treated as a commodity and taxed at twenty-eight percent. Craig Anthony, *Taxes on Physical Gold and Silver Investments*, Investopedia (Feb. 16, 2020), https://www.investopedia.com/articles/personal-finance/081616/understanding-taxes-physical-goldsilver-investments.asp.

522. Matt Hougan, *How Bitcoin Is Taxed*, Forbes (June 11, 2019), https://www.forbes.com/sites/matthougan/2019/06/11/how-bitcoin-is-taxed/#2cbdfafd6da5.

Exchange Traded Funds (ETFs) have to be marked to market at the end of the year in the United States.[523]

The U.K. HMRC does not treat cryptoassets as currency or money.[524] Cryptoassets are generally held for personal investment purposes and subject to capital gains tax. Income tax and national insurance may apply where the assets are received from an employer in the form of a non-cash payment or through mining, transaction confirmations, or airdrops.[525] Mining may amount to a taxable trade depending upon the degree of activity, organisation, risk, and commerciality and be subject to income tax.[526] Income tax will generally not apply to airdrop assets, in particular, where nothing is provided in return, and there is no separate trade or business involved.[527] Losses can be claimed for assets that have become worthless and of "negligible value."[528] This may apply to assets in respect of which the private cryptographic key has been lost. Theft or fraud is not treated as a disposal as the individual still has the right to recover them.[529]

The Financial Crimes Enforcement Network (FCEN) in the United States has confirmed that cryptocurrency accounts are not subject to reporting through a Foreign Bank and Financial Accounts Report (FBAR) and form FINCEN 114 which would otherwise require the disclosure of any assets worth over $10,000.[530] The FBAR requirements generally apply with regard to cash and securities rather than property.[531] There is no obligation to report asset amounts held in personal wallets although tax is applicable to any gains on disposal.[532] Separate disclosure requirements apply in the United States under Foreign Account Tax Compliance Act (FATCA) 2010 with a $50,000 threshold for a single tax payer and $100,000 for a joint

523. These are referred to as "'Section 1256 contracts" with tax being paid on any gains even if there is no sale. Sixty percent of gains are treated as long-term and forty percent short-term with a blended tax rate of 26.8%. *See id.*

524. *Cryptoassets: Tax for Individuals*, *supra* note 520.

525. Income tax will separate apply where the holder of the assets engage in trading although this will generally not apply to individuals unless they engage in frequent, organized and sophisticated trading. Income tax would then apply over capital gains tax in relation to all profits or losses. *Id.*

526. *See id.*

527. *See* Christopher Murrer, *The IRS Issues Income Tax Guidance Dealing with Cryptocurrency Hark Forks and Airdrop*, BLOCKCHAIN – BAKER MCKENZIE (Oct. 22, 2019), https://blockchain.bakermckenzie.com/2019/10/22/the-irs-issues-income-tax-guidance-dealing-with-cryptocurrency-hard-forks-and-airdrop/.

528. *Cryptoassets: Tax for Individuals*, *supra* note 520.

529. *Id.*

530. Reports of Foreign Financial Accounts, 21 C.F.R. § 1010.350 (2012).

531. *See* William Baldwin, *Bitcoin: IRS Takes on the Crooks – And the Good Guys*, FORBES (July 18, 2019), https://www.forbes.com/sites/baldwin/2019/07/18/bitcoin-irs-takes-on-the-crooksand-the-good-guys/#602bf8394248.

532. *Id.*

return filer using form 8938.[533] Non-U.S. foreign financial institutions (FFIs) are required to search records and report on U.S. identities and assets.[534]

Bitcoin and similar assets are treated as "currency, banknotes and coins used as legal tender" and are exempt for VAT purposes within the European Union.[535] The Swedish Revenue Law Commission had treated Bitcoin as a means of payment with exchange transactions for the purchase and sale of Bitcoin being exempt from VAT as being similar to a legal means of payment with the Swedish Tax Authority (*Skatteverket*) appealing to the Supreme Administrative Court in Sweden.[536] The Court of Justice of the European Union held that the transactions constituted the supply of a service for consideration but that the transactions were exempt from VAT.[537] The EU Financial Services Commissioner, Valdis Dombrovskis, has separately confirmed that transactions involving the purchase or sale of Bitcoin are exempt from VAT as Bitcoin constitutes a means of payment.[538] Bitcoin mining was treated as exempt from VAT in Germany.[539] Online trading platforms are not exempt where they only provide IT technical processing services although they are exempt if they provided intermediary services in their own name.[540]

Big Tech companies may become subject to an additional "digital tax" or "Tech Tax" under recent G20 proposals.[541] The G20 agreed at the Fukuoka, Japan Finance Ministers' meeting that a new international tax structure should be agreed to levy charges on large technology companies without the need to establish physical presence.[542] The OECD and G20 had outlined

533. *Comparison of Form 8938 and FBAR Requirements*, INTERNAL REVENUE SERVICE [IRS] (Apr. 22, 2020), https://www.irs.gov/businesses/comparison-of-form-8938-and-fbar-requirements.

534. *See FATCA Information for Foreign Financial Institutions and Entities*, INTERNAL REVENUE SERVICE [IRS] (Jan. 31, 2020), https://www.irs.gov/businesses/corporations/information-for-foreign-financial-institutions; *See, e.g.*, Agreement to Improve International Tax Compliance and to Implement FATCA, N.Ir.-U.K.-U.S., Sept. 12, 2012.

535. Case C-264/14, Skatteverket v. David Hedqvist, 2015 E.C.R. 718.

536. David Hedqvist sought to provide an exchange service for Bitcoin and asked for a preliminary ruling from the Swedish Revenue Law Commission. *Id.*

537. The exchange transactions were a service for consideration as there was an exchange of different means of payment and direct link between the service provided and consideration received in the form of margin price. The transactions were then exempt from VAT as currency, banknotes and coins used as legal tender. *Id.*

538. *Bitcoin and Taxes: A Guide to Get Started*, BITWALA ACAD., https://www.bitwala.com/academy/bitcoin-and-taxes-a-guide-to-get-started/ (last visited Aug. 11, 2020).

539. *Germany: Federal Ministry of Finance Publishes Guidance on VAT Treatment of Virtual Currencies*, LAW LIBR. OF CONG. (Mar. 13, 2018), https://www.loc.gov/law/foreign-news/article/germany-federal-ministry-of-finance-publishes-guidance-on-vat-treatment-of-virtual-currencies/.

540. *Id.*

541. Robin Harding, *Digital Giants Face Tax Setback After G20 Agreement*, FIN. TIMES (June 9, 2019), https://www.ft.com/content/f00d2f70-8a6f-11e9-a1c1-51bf8f989972.

542. *Id.*

digital tax proposals in May 2019[543] as part of the Base Erosion and Profit Shifting (BEPS) Project which led to a 2015 BEPS Action 1 Report.[544] 129 countries participated in the Inclusive Framework with the Steering Group attempting to prepare a consensus solution for adoption in January 2020.[545] The May 2019 document is based on two pillars with Pillar One focusing on the allocation of taxing rights and the revision of profit allocation and nexus (relationship) rules.[546] Pillar Two is intended to establish a global anti-base erosion (GloBE) proposal to allow countries to "tax back" firms where other jurisdictions have not exercised their primary taxing rights or only at an inadequately low level.[547] While the proposals may impact Facebook directly, it is unclear to what extent they may be extended to apply to such operations as Libra and the Libra Association.

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543. *See Programme of Work to Develop a Consensus Solution to the Tax Challenges Arising from the Digitalisation of the Economy*, ORG. FOR ECON. CO-OPERATION & DEV. [OECD] (May 2019), https://www.oecd.org/tax/beps/programme-of-work-to-develop-a-consensus-solution-to-the-tax-challenges-arising-from-the-digitalisation-of-the-economy.pdf; *OCED/G20 Inclusive Framework on BEPS: Progress Report July 2018 – May 2019*, ORG. FOR ECON. CO-OPERATION & DEV. [OECD] (May 2019), https://www.oecd.org/tax/beps/inclusive-framework-on-beps-progress-report-july-2018-may-2019.pdf.

544. *See Addressing the Tax Challenges of the Digital Economy, Action 1: 2015 Final Report*, ORG. FOR ECON. CO-OPERATION & DEV. [OECD], https://www.oecd-ilibrary.org/docserver/9789264241046-en.pdf?expires=1594583261&id=id&accname=guest&checksum=5097DA09E5376D82E75D082F06AEDFBF (last visited July 12, 2020).

545. Alexander Hartley, *OECD to Consider Worldwide Fractional Apportionment*, INT'L TAX REV. (May 31, 2019), https://www.internationaltaxreview.com/article/b1fn11dyl8mz6d/oecd-to-consider-worldwide-fractional-apportionment. The Action One Report had proposed a destination principle on the collection of Value Added Taxes (VAT)/Goods and Services Taxes (GST) following the OECD 2017 International VAT/GST Guidelines. *Action 1: Tax Challenges Arising from Digitalisation*, ORG. FOR ECON. CO-OPERATION & DEVELOPMENT [OECD], https://www.oecd.org/tax/beps/beps-actions/action1/ (last visited Aug. 11, 2020). A series of "nexus [relationship], data, and characterisation" issues arose with regard to direct taxes which went beyond BEPS and was concerned with the allocation of taxing rights. *Id.* (citing OECD/G20 Base Erosion and Profit Shifting Project, *Addressing the Tax Challenges of the Digital Economy, Action 1 - 2015 Report*, (Oct. 15, 2015)). The Task Force on the Digital Economy (TFDE) outlined the two pillar proposals which would be developed on a "without prejudice" basis. *See* OECD/ G20 Base Erosion and Profit Shifting Project, *Tax Challenges Arising from Digitalisation- Interim Report 2018*, (Mar. 16, 2018). It was agreed that no taxation would be imposed where there was no economy profit or this would result in double taxation. *Id.* at 101. Separate political concerns arose in the event that the Inclusive Framework was not sufficient to deliver a comprehensive consensus-based solution and that uncoordinated unilateral measures would be imposed by different countries which would undermine predictability and stability in global economic growth. *Id.* at 20. Specific concerns arose with companies operating in countries without physical presences relying on intangible assets and data rights and service provision. *Id.* at 51–53. The work programme set out in the May 29 document was intended to assist develop a longer-term solution to these fundamental problems. *Programme of Work to Develop a Consensus Solution to the Tax Challenges Arising from the Digitalisation of the Economy*, *supra* note 543.

546. *Programme of Work to Develop a Consensus Solution to the Tax Challenges Arising from the Digitalisation of the Economy*, *supra* note 543.

547. *Id.*

F. Consumer Protection Policy

A number of issues arise with regard to consumer and investor protection in relation to stablecoins and GSCs. Consumers must be provided with all necessary information to allow them to properly to understand the nature of the asset and risks concerned.[548] Potential investors must be properly informed of the nature of the specific asset created for legal and regulatory purposes and all associated rights and obligations including the availability or non-availability of regulatory protection such as in relation to deposit or investor compensation fund protection.[549] The nature of the coin in terms of local money, security, or other regulatory laws should be specifically disclosed.[550] This could cause specific difficulties for stablecoin issuers especially where the coin was treated for different purposes in countries and differently again between countries.

Other issues arise with regard to digital identity and data protection and data exchange.[551] Significant difficulties may arise in practice with substantial differences in digital identity and data protection being provided in countries.[552] Over thirty of countries have no digital data protection law.[553] The G20 has recommended the development of global standards on the definition, protection, storage, exchange, and trade in data in 2019.[554] Convergence of domestic laws is, for example, discussed by the Global Privacy Assembly (GPA) and International Conference of Data Protection and Privacy Commissioners (ICDPPC) which consists of 130 privacy and data protection authorities.[555]

One of the most significant proposals in the Libra programme is to develop a standard digital identity tool, although the mechanism to be used remains unclear. Agreeing a common global digital identity solution has been a difficult issue at the international level with specific issues arising with regard to exclusion and the unbanked in many emerging economies.[556] The Libra White Paper refers to the need to support the 1.7 billion unbanked.[557] This also raises wider issues with regard to the development of

548. G7 Working Group on Stablecoins, *supra* note 19, at 15.
549. *Id.*
550. *Id.* at 5–6.
551. *Id.* at 9–10.
552. *Id.*
553. *Data Protection and Privacy Legislation Worldwide*, UNCTAD (Feb. 24, 2020), https://unctad.org/en/pages/dtl/sti_and_icts/ict4d-legislation/ecom-data-protection-laws.aspx.
554. G7 Working Group on Stablecoins, *supra* note 19, at 9–10. *See G20 Osaka Leaders' Declaration*, G20 (June 29, 2019), https://g20.org/en/g20/Documents/2019-Japan-G20%20Osaka%20Leaders%20Declaration.pdf.
555. The GPA began meeting as the ICDPPC in 1979 with a membership of more than 130 data protection and privacy authorities. *See generally* Global Privacy Assembly, https://globalprivacyassembly.org/ (last visited July 28, 2020).
556. *See, e.g.*, Douglas Arner et al., *The Identity Challenge in Finance: Froom Analogue Identity to Digitized Identification to Digital KYC Utilities*, Eur. Banking Inst. Working Paper Series 2018 No. 28; *see* G7 Working Group on Stablecoins, *supra* note 19, at 10.
557. Libra Ass'n Members,, *supra* note 89.

self-sovereign identity (SSI) which refers to the ability of individuals and businesses to own their analogue and digital identity and to control personal data use and exchange.[558]

It is unclear to what extent digital identity could be developed solely within the Libra framework or by Facebook more generally with its 2.4 billion direct and indirect account holders.[559] Facebook may be able to develop a highly effective digital identity solution quickly which could be used by up to one third of the world's population. The development of a digital and sovereign identity tool by Libra could be a significant achievement. The principal policy issue that arises is whether governments would be willing to allow this to be managed and controlled by private bodies such as Facebook and the Libra Association. One solution would be to make the use of private identity channels but subject to such safeguards as those set out in the EU Electronic identification (eID) and electronic Trust Services (eTS) mechanisms provided for under the eIDAS Regulation 2014.[560] This has to be considered further.

G. Financial Integrity Policy

It is essential to protect the integrity of financial markets both in terms of preventing abuse through criminal use and promoting high standards of ethical conduct. Authorities must prevent abuse of the financial system for money laundering and terrorist financing purposes.[561] Virtual assets including blockchain, Bitcoin, cryptoassets, and virtual currencies may be used for criminal purposes.[562] The Financial Action Task Force (FATF) Money Laundering Recommendations were amended in October 2018 and June 2019 to apply to virtual assets and virtual asset service providers (VASPs).[563] FATF Recommendation 15 applies its standards to new

558. *See, e.g.*, Metadium, *Introduction to Self-Sovereign Identity and Its 10 Guiding Principles*, Medium (Jan. 10, 2019), https://medium.com/metadium/introduction-to-self-sovereign-identity-and-its-10-guiding-principles-97c1ba603872.

559. *See* Andrew Hutchinson, *Facebook Reaches 2.38 Billion Users, Beats Revenue Estimates in Latest Update*, Social Media Today (Apr. 24, 2019), https://www.socialmediatoday.com/news/facebook-reaches-238-billion-users-beats-revenue-estimates-in-latest-upda/553403/.

560. *See* Regulation (EU) 918/2014 of the European Parliament and of the Council of 23 July 2014 on Electronic Identification and Trust Services for Electronic Transactions in the Internal Market; Repealing Directive 1999/93/EC, 2014 O.J (L257) 73.

561. G7 Working Group on Stablecoins, *supra* note 19, at 10. *See, e.g.*, Michèle Finck, *Blockchains and Data Protection in the European Union*, EU Data Prot. L. Rev., 17 (2018).

562. *Virtual Assets*, Fin. Action Task Force [FATF], https://www.fatf-gafi.org/publications/virtualassets/documents/virtual-assets.html?hf=10&b=0&s=desc(fatf_releasedate).

563. A virtual asset is defined as "any digital representation of value that can be digitally traded or transferred and can be used for payment or investment purposes" not including "digital representations of fiat currencies, securities, and other financial assets that are already covered elsewhere in the FATF Recommendations." *Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Service Provider*, Fin. Action Task Force [FATF] 13 (June 2019), https://www.fatf-gafi.org/media/fatf/documents/recommendations/RBA-VA-VASPs. A virtual asset service provider (VASP) means "any natural or legal person who is not covered elsewhere under

technology including virtual assets and VASPs.[564] A separate Statement on Virtual Assets and VASPs was produced in June 2019.[565] The key challenge is to ensure that implementing national provisions are extended to cover all potential stablecoin and other virtual asset related activities.

Appropriate ethical standards should also be developed in relation to technology and StableTech specifically. The Libra Association may consider issuing its own specific objectives or standards in this area. Many activities may fall outside the scope of strict legal and regulatory perimeter. It is necessary in such cases to ensure that appropriate more appropriate general standards of good or best practice are applied. These may be based on existing financial standards such as the Principles for Business (PRIN)[566] imposed by the Financial Conduct Authority (FCA) in the United Kingdom and parallel Fundamental Rules (FRs) adopted by the PRA).[567] These standards are essentially based on inter alia integrity, acting with due skill, care, and diligence, protecting the clients' interests, and avoiding conflicts of interest and transparency which are derived from common law standards.[568] Equivalent measures are applied by other professional bodies such as in

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the Recommendations and as a business conducts one or more of the following activities or operations for or on behalf of another natural or legal person: (i) Exchange between virtual assets and fiat currency; (ii) Exchange between one or more forms of virtual asset; (iii) Transfer of virtual assets; and (iv) Safekeeping and/or administration of virtual assets or instruments enabling control over virtual assets; (v) Participation in and provision of financial services related to an issuer's offer and/or sale of a virtual asset." *Id.* at 13–14.

564. Public Statement, Fin. Action Task Force, Mitigating Risks from Virtual Assets (Feb. 22, 2019), https://www.fatf-gafi.org/publications/fatfrecommendations/documents/regulation-virtual-assets-interpretive-note.html.

565. *Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Service Provider*, *supra* note 544.

566. *See Principles for Business*, Ch. 2.1, FIN. CONDUCT AUTH. (July 2020), https://www.handbook.fca.org.uk/handbook/PRIN/2/1.html. Similar standards are imposed on individuals as opposed to firms under the FCA Approved Persons Regime and new COCON standards adopted under its Senior Managers and Certification Regime (SMCR). *See*, *Code of Conduct*, Ch. 2, FIN. CONDUCT AUTH. (July 2020), https://www.handbook.fca.org.uk/handbook/COCON/2/?view=chapter.

567. *See Fundamental Rules and Principles for Businesses*, BANK OF ENGLAND (Jan. 2016), https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/new-bank/fundamentalrule principles.

568. Michael Blair, FINANCIAL SERVICES: THE NEW CORE RULES (Blackstone London, 1991).

relation to foreign exchange, bullion, and other wholesale markets.[569] Similar codes and standards are published by other professional bodies.[570]

A number of technology related sets of standards and best practices have been published separately. *The Partnership on Artificial Intelligence to Benefit People and Society*, a nonprofit, was, for example, established by a number of major BigTech companies in 2016 to promote standards on artificial intelligence (AI)[571] with other measures being produced by the OECD[572] and EU High-Level Expert Group on Artificial Intelligence (AI HLEG).[573] Other technology related principles and measures have also been adopted,[574] such as under the Open AI initiative.[575] An appropriately drafted set of consolidated financial and technology standards could be developed for use in relation to digital currencies, including stablecoins, and other related technology.

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569. These were covered by the earlier Bank of England, Foreign Exchange Joint Standing Committee (FX JSC), Non-Investment Products (NIP) Code (2011). *See* RICHARD FRASE, DECHERT'S FIN. SERVS. GRP., *The Non-Investment Products Code*, 15 DECHERT ON POINT, 12 (Dec. 2011). This was replaced by the FX Global Code (May 2017), UK Money Markets Code (April 2017), and Global Precious Metals Code (May 2017) in 2018 following the joint Fair and Effective Markets Review (FEMR) (June 2015) published by HM Treasury, the Bank of England, and FCA. *See, FX Global Code of Conduct*, FX GLOBAL CODE, http://fxglobalcode.com/ (last visited July 28, 2020); *Money Markets Committee and UK Money Markets Code*, BANK OF ENG., https://www.bankofengland.co.uk/markets/money-markets-committee-and-uk-money-markets-code (last visited July 19, 2020); *Global Previous Metals Code*, LBMA, http://www.lbma.org.uk/global-precious-metals-code (last visited July 19, 2020); *Fair and Effective Markets Review*, BANK OF ENG., https://www.bankofengland.co.uk/report/2015/fair-and-effective-markets-review—-final-report (last visited July 19, 2020).

570. *See, e.g.*, *Code of Conduct*, CISI, https://www.cisi.org/cisiweb2/docs/default-source/cisi-website/ethics/code-of-conduct-16.pdf?sfvrsn=2 (last visited July 18, 2020).

571. Richard Waters, *US Tech Groups Unite to Dispel AI Fears*, FIN. TIMES (Sept. 28, 2016), https://www.ft.com/content/8cc17b3c-8596-11e6-a29c-6e7d9515ad15. *See also About Us*, P'SHIP ON AI, https://www.partnershiponai.org (last visited July 28, 2020).

572. *What Are the OECD Principles on AI?*, OECD, https://www.oecd.org/going-digital/ai/principles/ (last visited July 28, 2020).

573. *Ethics Guidelines for Trustworthy AI*, EUR. COMM'N (July 9, 2020), https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai; *EU Artificial Intelligence Ethics Checklist Ready for Testing as New Policy Recommendations are Published*, EUR. COMM'N (June 28, 2019), https://ec.europa.eu/digital-single-market/en/news/eu-artificial-intelligence-ethics-checklist-ready-testing-new-policy-recommendations-are.

574. *See generally* The Institute of Electrical and Electronics Engineers [IIEE], *Ethically Aligned Design* (Version 2, 2017), https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/ead_v2.pdf; Yolanda Gil, et al., *A 20-Year Community Roadmap for Artificial Intelligence Research in the US*, U.S. COMPUTING CMTY. CONSORTIUM & ASS'N FOR THE ADVANCEMENT OF A.I. (Aug. 6, 2019), https://cra.org/ccc/wp-content/uploads/sites/2/2019/08/Community-Roadmap-for-AI-Research.pdf.

575. The Open AI research laboratory was set up in San Francisco, California by Elon Musk, Sam Altman, and others in December 2015 to ensure that artificial general intelligence benefits humanity. *See generally* OPEN AI, https://openai.com/about/ (last visited July 18, 2020).

H. Financial Stability and Co-Prudential Regulation

Libra coin will only succeed if it is able to resolve all of the significant core underlying technology challenges that arise. A new twelve-part architecture has been constructed to examine this.[576] The authorities may not be required to take any additional action if Facebook and the Libra Association are not able to resolve all of the essential technology obstacles that arise. Authorities must nevertheless prepare for this or for another separate SuperCoin or SuperApp in the future.

A number of new initiatives have still to be considered. It is initially essential that the full range of new risks and exposures that may arise with the growth of stablecoins and GSCs or other new digital applications are fully considered. Only limited work has been carried out in this area to date.[577] This includes all traditional forms of financial, legal, and operational, conduct, and wider management or environmental risks. This will also include the specific additional challenges that arise with regard to new forms of technology risk, information risk, data risk,[578] cyber security risk, and possibly digital fragmentation risk.[579] These have been subject to adequate examination. It is essential to ensure that all potential exposures and possible sources of loss are contained. Authorities could consider constructing a series of new digital risk maps or taxonomies for this purpose to ensure that all of the relevant vulnerabilities that arise are contained and managed in practice.

A separate more specific solution may be to attempt to create a closer relationship between financial markets, institutions, and supervisory agencies. Authorities could explore using technology to create new linkages that would allow them to understand market and institutional conditions in a more direct and immediate manner and to monitor ongoing risk management capability and compliance more directly. The objective would not be to replace individual firm decision taking and responsibility for internal risk management but to allow supervision to operate on a more direct and integrated basis.[580] This may either be attempted using existing market and risk management models or new forms of blockchain and distributed ledger technology. Authority access may, for example, be

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576. *See* discussion *supra* Section VI.

577. *See generally* G.A. Walker, *Digital Information Law – Meaning, Challenge, and Future*, 53 Int'l L. 127, 180 (2020).

578. *Id.*

579. Fragmentation risk can be considered to be concerned with the entry of large numbers of new digital platforms into the financial area which break up existing product and delivery chains or cycles and the associated governance and compliance risk that this creates.

580. Andy Haldane has, for example, predicted that authorities would receive market data changes in almost real time conditions. Andy Haldane, Chief Economist, Bank of Eng., Speech at the Maxwell Fry Annual Glob. Fin. Lecture, Birmingham Univ. (Oct. 29, 2014) *in Andrew G. Haldane Managing Global Finance as a System*, Bank for Int'l Settlements [BIS], https://www.bis.org/review/r141030f.pdf (last visited Aug. 11, 2020).

incorporated into DLT designs which would create a form of "embedded supervision" or "embedded regulation."[581]

Technology could in this way be used to improve both regulation and supervision which would create a form of new co-prudential regulation (co-regulation) or co-prudential supervision (co-supervision). This could reduce latency and allow authorities to monitor markets and firms more immediately which could also significantly increase accuracy and security at the same time as lower compliance and monitoring costs. This could be considered as part of new Regulatory Technology (RegTech) solutions.[582]

I. Digital Fragmentation and Para-Prudential Regulation

Libra raises a number of significant issues with regard to legal and regulatory compliance. These are partly concerned with confirming the extent to which Libra or another stablecoin may fall within existing legal and regulatory definitions or regulatory perimeters.[583] This may trigger specific definitions or scope rules concerning money, payment, banking, security, commodity, collection investment scheme, market infrastructure, note issuance, legal tender and counterfeiting, cyber security, anti-money laundering and terrorist financing, data protection and information provision, and financial inclusion.[584] All of this has to be confirmed in each relevant jurisdiction.

A series of wider compliance considerations also apply especially in a post-global financial crisis environment.[585] A number of important reforms were adopted following the global financial crisis.[586] These can generally be considered in terms of financial regulation,[587] financial supervision,[588]

581. Compliance systems can be constructed in markets using tokenized assets with authorities being able to monitor automatically the market's ledger using a form of embedded supervision without the need for firms to actively and separately collect, verify and deliver data. This may also operate where separate miners are used to verify transactions (such as on a PoW model) by incorporated appropriate incentives. *See* Raphael Auer, *Embedded Supervision: How to Build Regulation into Blockchain Finance* 1 (Monetary and Econ. Dep't, Bank for Int'l Settlement Working Paper No. 811, 2019).

582. *See* discussion *supra* Section VII.11.

583. *See* discussion *supra* Section V.

584. *Id.*

585. Walker, *supra* note 245, at ch. 1.

586. *See generally* G.A. Walker, *UK Regulatory Revision - A New Blueprint for Reform*, 46 Int'l Law. 787 (2012); G.A. Walker, *Financial Crisis - UK Policy Response*, 44 Int'l Law. 751, 752 (2010).

587. Regulation is a control function and refers to the imposition of specific obligations on the establishment and conduct of financial institutions in specific markets. G.A. Walker, International Banking Regulation Law, Policy and Practice (Kluwer Law Int'l 2001).

588. Supervision is an oversight function and refers to the monitoring or reviewing of the stability of markets or compliance by financial firms with specific regulatory obligations imposed. *Id.*

financial resolution,[589] market or financial support, and financial oversight or macro-prudential regulation.

A revised official regulatory control agenda has been constructed based on improved regulation, supervision, resolution, support, and macro-prudential oversight. This has to be further strengthened to deal with new technology-driven vulnerabilities. A new "regulatory toolkit" or "technology suite" could be constructed for this purpose. Regulatory requirements have to be reviewed to deal with new technology conditions including in relation to suitability assessments, governance and systems controls, capital, liquidity, and leverage. Supervisory practices have to focus on technology- related systems with national and international college arrangements being revised to include "technology colleges" or "technology committees" or "technology sub-committees" (TCs). Pre-crisis and post-crisis resolution planning has to allow for technology failure. This may include the design of new Technology Recovery Programmes (TRPs), Technology Resolution Regimes (TRRs), and Technology of Last Resort (TLR).[590] Revised Special Resolution Regimes (SRRs) could be developed incorporating technology-specific resolution mechanisms with new Technology Resolution Regimes (TRRs). Macro-prudential oversight capacity would be extended to include technology expertise and focus creating a specific new form of MacroTech. A series of appropriate revisions could accordingly be made to the new post-crisis regulatory suite of measures to include effective technology- related capability and capacity.

The immediate post-global financial crisis control toolkit or suite would more generally have to be extended to include other areas of new regulatory focus and attention. These specifically include data protection laws, infrastructure regulation, and new cybersecurity measures.[591] Important work has already been carried out in each of these areas, although this will have to be extended and further adjusted to provide adequate protection in response to new emerging technological innovations. A continuing new control toolkit or suite would then be constructed on the basis of enhanced technology-connected regulation, supervision, data protection, infrastructure, cybersecurity, resolution, support, and oversight mechanisms.

One of the specific residual challenges that would arise is in coordinating the action of domestic regulatory agents and overseas bodies on a cross-border basis. New forms of para-prudential regulation (or para-regulation) could accordingly be constructed to ameliorate these difficulties. This

589. *See generally* G.A. Walker, *Financial Crisis and Financial Resolution*, 29 B.F.L.R. 55 (2013).

590. TRPs would include technology- related alternative systems and continuity planning. TRRs would expressly incorporate technology systems in transfer, administration, or winding-up procedures. TLR would include providing emergency technology rather than simple funding facilities in the event of a crisis such as through the provision of emergency technology transfer or support systems. These are, for example, provided by such cloud systems providers as Amazon. *See CloudEndure Disaster Recovery*, AMAZON WEB SERVS., https:///aws.amazon.com/disaster-recovery/ (last visited July 18, 2020).

591. *See* discussion *supra* Sections V.G, V.I, V.K.

would essentially be based on effective communication channels and coordinated group action at the national and international level. This could build on existing Supervisory College or Crisis Management Group (CMG) systems,[592] although para-prudential regulation would attempt to promote regulatory convergence as well as coordinated regulatory decision taking. This would be both substantive and operational. This new form of para-control could again be extended to include specific forms of para-regulation, para-supervision, para-resolution, para-support, and para-oversight. This would be necessary to deal with the new regulatory challenges raised by Libra and similar GSCs.

J. Policy Fragmentation and Poly-Prudential Regulation

All of the wider policy issues referred to must also be managed on an integrated basis in dealing with any potential new stablecoins or supercoins like Libra. A parallel wider policy toolkit or suite would have to be constructed in addition to the legal and regulatory and technology programmes referred to. This would create three parallel legal and regulatory, technology, and policy agenda in addition to the technical architecture previously referenced.[593] The policy areas covered could specifically include competition law, market integrity, monetary policy, monetary stability, taxation, consumer protection, financial integrity, and financial stability.[594]

Financial regulation was extended following the global financial crisis from a market or sector specific micro-prudential to macro-prudential scope of coverage to monitor and identify wider threats to the financial system. These micro and macro phases or iterations could then be extended again to create a form of multi-prudential, poly-prudential, or poly-model regulation. An eight-part policy model could be constructed within the new poly-prudential or poly-modal third level framework based on the core areas referred to.

The objective would be to ensure that each of these policy areas were considered and coordinated at the national and international levels and necessary legal and regulatory provisions and powers applied in a total or integrated basis. This would be supported by the co-regulatory and para-regulatory mechanisms referred to. Specific forms of poly-regulatory, poly-supervisory, poly-resolution, poly-support, and poly-prudential oversight could also be created as with co-regulation and para-regulation.

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592. *See* Basel Comm. on Banking Supervision, Good Practice Principles on Supervisory Colleges (Bank for Int'l Settlements 2010); Basel Comm. on Banking Supervision, Principles for Effective Supervisory Colleges (Bank for Int'l Settlements 2014); Basel Comm. on Banking Supervision, Progress Report on the Implementation of Principles for Effective Supervisory Colleges (Bank for Int'l Settlements 2017). *See also* Key Attributes of Effective Resolution Regimes for Financial Institutions (Financial Stability Board 2014); Walker, *supra* note 471, at 81.

593. *See* discussion *supra* Sections V, VI, VII.

594. *See* discussion *supra* Section VII.A–VII.G, VII.L.

A new form of conditional and country-specific regulatory approval could also be developed to require that Libra or another GSC or SuperCoin was only allowed to operate for so long as it complied with all relevant conditions in each of these policy areas and in each jurisdiction in which it was used. This conditional approval would then be monitored on a continuing basis within the new poly-modal model created.

The effect of all of this on domestic and international financial stability would have to be subject to active monitoring and review over time. The nature of financial stability and financial stability related ideas had to be extended following the global financial crisis including as part of new macro-prudential frameworks. Central banks also had to re-consider the scope of their functions and responsibilities as earlier narrow monetary policy mandates were considered inadequate. Financial stability should include wider technology matters and the impact of all of the additional policy, as well as legal, regulatory, and technical issues referred to. All of these elements can be drawn together under the new poly-prudential or poly-modal framework advanced.

K. Regulatory Technology and Adaptive Regulation

Libra and new StableTech also raises the opportunity to review underlying regulatory policy approaches and mechanisms. Financial markets have already been substantially impacted by developments in BigTech and DataTech with regulatory changes arising as a result of continued innovation in regulatory technology (RegTech).[595] RegTech generally refers to the use of technology for control or compliance purposes.[596] RegTech has been referred to as using new technologies to solve regulatory and compliance requirements more effectively and efficiently.[597] The U.K. Government Office for Science has recommended the creation of a state-of-the-art regulatory reporting and analytics infrastructure with RegTech.[598] RegTech may bring a number of significant operational advantages especially in terms of agility, speed, integration, and analytics.[599]

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595. G.A. Walker, *Regulatory Technology (RegTech) – Construction of a New Regulatory Policy and Model*, 54 Int'l Law. (forthcoming 2021).

596. General RegTech may be considered to include more specific control technology (ControlTech), supervisory technology (SuperTech) or firm specific compliance (CompTech). This may also then include policy technology (PolicyTech), resolution technology (ResTech), market support technology (SupTech or CrisisTech) and macro-prudential or macro-technology (MacroTech). *Id.*

597. Inst. of Int'l Fin., *RegTech: Exploring Solutions for Regulatory Challenges*, Suade (Oct. 2015), https://suade.org/learn/iif-regtech.html.

598. UK Gov't Chief Sci. Adviser, Gov't Office for Sci., FinTech Futures: The UK as a World Leader in Financial Technologies, at 7 (2015).

599. *RegTech Is the New FinTech: How Agile Regulatory Technology Is Helping Firms Better Understand and Manage Their Risk*, Deloitte (2016), https://www2.deloitte.com/content/dam/Deloitte/ie/Documents/FinancialServices/IE_2016_FS_RegTech_is_the_new_FinTech.pdf. *See also* William Eggers et al., *The Future of Regulation: Principles for Regulating Emerging Technologies*,

RegTech can be used to improve regulatory authority function as well as firm compliance and systems and controls. This may improve identity management, risk management, regulatory compliance, and financial control as well as regulatory, supervisory, and macro-prudential analysis.[600] RegTech tools include machine learning, robotics and artificial intelligence, cryptography, biometrics, blockchain and other distributed ledgers, application program interfaces (APIs), and shared utility functions and current applications.[601] This may improve risk data aggregation, modelling, scenario analysis and forecasting, payment transaction monitoring, coin and legal person identification, internal culture and monitoring, financial market trading, and new regulatory identification.[602] Residual difficulties may nevertheless remain with regard to financial regulation and legislation, data harmonisation and definition, inefficient report portals and systems, and lack of effective anti-money laundering, and anti-terrorist financial control.[603] Additional limitations have to be considered in terms of regulatory uncertainty, unfamiliar and unclear technology solutions, lack of effective networks and platforms, and knowledge sharing barriers between authorities, and the financial industry.[604]

National authorities are currently developing new RegTech programmes and initiatives. The FCA established Project Innovate in the United Kingdom in October 2014 to promote innovation in financial services. Project Innovate is based on a Regulatory Sandbox, Direct Support, Advice Unit, RegTech, and wider Engagement programmes.[605] The U.K. Government had announced in its 2015 budget that the FCA would work with the PRA to identify and support the adoption of new technologies to deliver financial regulation. The FCA has assisted over 700 firms and received around 1,600 applications.[606]

The FCA published a Call for Input on RegTech in November 2015 with a feedback statement in July 2016.[607] The FCA consulted with industry representatives, trade bodies, consultancies, and academia and conducted a series of demonstrations and TechSprints. Four core areas of focus were

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DELOITTE (June 19, 2018), https://www2.deloitte.com/us/en/insights/industry/public-sector/future-of-regulation/regulating-emerging-technology.html.

600. JULIAN JONES ET AL., REGTECH 2.0 (Burnmark and Alvarez & Marsal 2018).

601. BART VAN LIEBERGEN ET AL., REGTECH IN FINANCIAL SERVICES: TECHNOLOGY SOLUTIONS FOR COMPLIANCE AND REPORTING, at 3–4 (Inst. of Int'l Fin. 2016).

602. *Id.* at 6.

603. *Id.* at 18–23.

604. *Id.* at 23–24.

605. *FCA Innovation – Fintech, Regtech and Innovative Businesses*, *supra* note 21.

606. *The Impact and Effectiveness of Innovate*, FIN. CONDUCT AUTH. 4–5 (Apr. 2019), https://www.fca.org.uk/publication/research/the-impact-and-effectiveness-of-innovate.pdf.

607. *Call for Input: Supporting the Development and Adoption of Regtech*, FIN. CONDUCT AUTH. (Nov. 2015), https://www.fca.org.uk/publication/call-for-input/regtech-call-for-input.pdf; *Call for Input on Supporting the Development and Adopters of Regtech*, FIN. CONDUCT AUTH. (July 2016), https://www.fca.org.uk/publication/feedback/fs-16-04.pdf.

identified: efficiency and collaboration;[608] integration, standards and understanding;[609] prediction, learning, and simplification;[610] and new directions.[611] Around twenty-two similar innovative regulatory projects have been set up or are being considered in other countries.[612] A large number of private platforms have also been created to develop RegTech opportunities.[613]

FinTech and RegTech may assist develop the new co-regulatory model recommended which would allow markets, institutions, and authorities to work more closely together, including through embedded regulation and supervision or co-regulation and co-supervision.[614] Authorities could also then attempt to develop a new regulatory methodology or approach that was more sensitive to technology and technology driven market change.[615] This would essentially be more adaptive and responsive and be able to reflect and respond to changes in market conditions and technology in a more dynamic and iterative manner. This would create a form of regulatory emergence with financial regulation continually changing to reflect adjustments in underlying market conditions and technological innovation.

A more specific new adaptive and emergent regulatory policy approach could accordingly be constructed which would reflect the new regulatory toolkit or suite referred to based on financial co-regulation, co-supervision, co-resolution, co-support, and co-oversight with enhanced para-regulation,

608. These included: (a) Modernising the Handbook (including semantics of Business Vocabulary and Business Rules (SBVR) and Natural Language Processing (NLP) to support machine reading); (b) Model Driven Regulation (using semantics and triples with subject/predicate/object form statements to map internal and external data ontologies); (c) Digital Regulatory Reporting; and (d) Improving Employee Security (in cooperation with CybSafe to combine behavioural modelling software with psychology and behavioural change theory). *Our Work Programme*, FIN. CONDUCT AUTH., https://www.fca.org.uk/print/firms/innovation/regtech/our-work-programme (last visited July 28, 2020).

609. These included: (a) Development of a standardised model to express data and processes (MITOC/ISDA); (b) developing a platform for intra-bank knowledge exchange on financial regulation (RegHome); and (c) design of a global IT risk and controls framework for banks to leverage new technology (ITRAC). *Id.*

610. These included: (a) Construction of a legal Intelligent Regulatory Assistant; (b) development of an Intelligent Regulatory Advisor; and (c) Ascent Experiment to develop use of Natural Language Processing (NLP) and Artificial Intelligence (AI) with the EU Markets and Financial Instruments Directive II (MiFID II). *Id.*

611. Development of Blockchain Technology for Algorithmic Regulation and Compliance (BARAC) including SmartReg compliance verification programme and Project Maison to use DLT for regulatory reporting purposes. *Id.*; *see Blockchain Technology for Algorithmic Regulation and Compliance (BARAC)*, UNIV. COLL. LONDON CTR. FOR BLOCKCHAIN TECHS., http://blockchain.cs.ucl.ac.uk/barac-project/ (last visited July 28, 2020).

612. Eggers, *supra* note 599.

613. *What Is Regtech? And Why Is It Becoming the Next Big Thing?*, COMPLY ADVANTAGE, https://complyadvantage.com/blog/what-is-regtech/ (last visited July 28, 2020).

614. *See* discussion *supra* Section VII.H.

615. The idea of adaption has separately been referred to by Deloitte, which recommends the adoption of a new model based on adaptation, regulatory sandboxes, and outcomes based, risk weighted, and collaborative regulation. Eggers, *supra* note 599 at 11–18.

para-supervision, para-resolution, para-support, and para-oversight facilities.[616] All of this would be supported by the new poly-prudential or poly-modal integrated policy framework recommended. Authorities could then experiment with the development of such a new policy approach part of their preparatory and operational work on Libra.

L. Global Financial Stability

The residual issue that arises with regard to Libra is ensuring that all of the above parallel sets of measures are applied in an integrated and effective manner. This includes the separate legal and regulatory, technology, and wider policy areas referred to. This would be supported by the new co-regulatory, para-regulatory, and poly-prudential or poly-modal models noted to. It is still necessary to ensure that all of this operates effective in practice.

A number of countries had established Regulatory Sandboxes within their innovation initiatives, such as with the U.K. Project Innovate. The sandbox allows firms to test products and services within a controlled environment, reduce launch times, support consumer protection safeguards, and provide better access to finance.[617] The FCA invites firms to apply to join the sandbox at advertised intervals with five sets of cohorts having been accepted to date. Around twenty countries have set up sandboxes[618] and five are considering it.[619] The FCA separately recommended the establishment of a global sandbox in February and March 2018, which led to the creation of the Global Financial Innovation Network (GFIN).[620] The GFIN was formerly launched in January 2019 and operates as a network of fifty regulatory authorities supporting financial innovation.[621]

The objective of the GFIN is to facilitate collaboration and shared experience, provide a forum for joint RegTech work and collaborative knowledge and lessons sharing, and provide firms with an environment to test cross-border solutions. The GFiN published a report on its activities, including on collaboration, joint work, and the development of cross-border

616. This would essentially be adaptive and reflexive, immersive and responsive, iterative and modular, resilient and sustainable, and emergent and participative. Walker, *supra* note 595.

617. *Regulatory Sandbox*, Fin. Conduct Auth., https://www.fca.org.uk/print/firms/innovation/regulatory-sandbox (last visited July 28, 2020).

618. United Kingdom, Canada, The Netherlands, Denmark, Russia, Hong Kong, Singapore, Brunei, Indonesia, Australia, Malaysia, Thailand, Mauritius, Bahrein, U.A.E., Dubai, Saudi Arabia, Jordan, Sierra Leone, and Switzerland. Eggers, *supra* note 599, at fig.5.

619. South Korea, Japan, Taiwan, India, and the United States. *Id.*

620. *Global Financial Innovation Network (GFIN)*, Fin. Conduct Auth. 3 (Aug. 2018), https://www.fca.org.uk/publication/consultation/gfin-consultation-document.pdf.

621. The GFIN consists of a coordination group, members, and observers. *Global Financial Innovation Network (GFIN)*, (Feb. 27, 2020) Fin. Conduct Auth., https://www.fca.org.uk/print/firms/innovation/global-financial-innovation-network.

solutions in 2019.[622] The GFiN confirmed that it would specifically focus its activities on growth (G), flexibility and adaptability (F), innovation and inclusivity (I), and creating a network (N) to support innovation in financial markets and inter-agency learning.[623]

The establishment of the GFiN was important in promoting collaboration, cooperation, and exchange on financial innovation in the regulatory area. The underlying objective is nevertheless to promote support and cooperation rather than the conduct of regulatory oversight directly. Many members may also not have any formal statutory financial stability responsibilities, such as with the FCA in the United Kingdom. The nascent GFiN mechanism could then be extended to create a form of active Global Financial regulatory Network (GFrN), which may incorporate or include a possible Global Regulatory and enforcement Network (GReN). This would, for example, extend the work carried out by the Basel Committee on the creation of global supervisory colleges for banks.[624] This also reflects the more specific Crisis Management Groups (CMGs) provided for under the FSB Key Attributes for Effective Resolution Regimes.[625] The effect would be to create an equivalent regime for the cooperative supervision of new FinTech platforms and products. This could be attempted on an experimental basis for initial use in relation to Libra with more permanent arrangements possibly being maintained subsequently.

The regulatory sandbox device could also be formalised through the creation of global Regulatory Boxes or Control Boxes for innovative new platforms or firms, such as Libra, which would make them subject to direct oversight. Separate Regulatory Zones or Control Zones could also be created within the regulatory or control boxes to designate where a specific new digital coin or product had relevant permissions or authorisation. A parallel set of regulatory zones or policy zones could accordingly be incorporated within the regulatory and control box models. These would specifically record at any point in time to what extent specific compliance had been secured in each country or jurisdiction or residual issues arose in relation to the other wider public policy issues referred to.[626] The objective would be to bring all relevant national legal, regulatory, and policy

622. GLOB. FIN. INNOVATION NETWORK [GFiN], *One Year On*, at 6 (2019), https://static1.squarespace.com/static/5db7cdf53d173c0e010e8f68/t/5dbfaaca6b4e151deddc42ae/1572842207667/GFIN-One-year-on-FINAL-20190612+%28CLEAN+VERSION%29.pdf.

623. *Id.* at 10.

624. *See generally* Basel Comm. On Banking SupervisionBasel Committee, *Principles for Effective Supervisory Colleges*, BANK FOR INT'L SETTLEMENTS [BIS] (June 2014), https://www.bis.org/publ/bcbs287.pdf. The Basel Committee published a separate update. Basel Comm. on Banking Supervision, *Progress Report on the Implementation of Principles for Effective Supervisory Colleges*, BANK FOR INT'L SETTLEMENTS [BIS] (Dec. 2017), https://www.bis.org/bcbs/publ/d430.pdf.

625. Fin. Stability Bd., *Key Attributes of Effective Resolution Regimes for Financial Institutions*, at § 8 (Oct. 15, 2014), https://www.fsb.org/wp-content/uploads/r_141015.pdf. *See also* sources cited *supra* note 592.

626. *See* discussion *supra* Section VII.A–VII.G, VII.L.

determinations within a single easy to access and update integrated reference framework.

A further global FinTech Compendium (FTC), or FinTech & RegTech Compendium, could be created on the model of the Compendium of Standards developed by the Financial Stability Forum (FSF) and later FSB.[627] This consists of over 300 global financial standards governing financial market activity and regulation which include around fifteen key standards.[628] This operates on an online or virtual basis by including links to all of the key financial documentation produced by other international financial organisations and standard setting bodies subject to specified criteria as set by the FSB. A parallel set of FinTech and RegTech measures could accordingly be created that would include, for example, any new financial or technology ethics protocols proposed.[629]

The new FinTech Compendium could follow a similar structure to that outlined in this paper. This could be divided into legal, regulatory, and policy standards as discussed.[630] All relevant international measures would be consolidated with new standards included over time. Sub-divisions could be included to deal with, for example, digital coins, stablecoins, other tokenised and digital assets, smart contracts, and other uses of blockchain, graph, and distributed ledger technology. The virtual compendium could also link to national domestic implementing measures to provide a comprehensive overview of all relevant conditions and obligations that had to be complied with for all new digital coins or other assets or programs. This could take the form of a supporting virtual FinTech & RegTech Directory of relevant domestic measures.

The potential launch of Libra or any other GSC or SuperCoin necessarily requires a further extension of emerging ideas of national and international financial stability. This must allow for all new technology driven threats and exposures, as well as incorporating effective assessments of all relevant legal and regulatory, as well as technology and wider public policy issues. It is possible to pull all of this together into a single integrated set of assessment regulatory toolkits or suites. New forms of co-prudential, para-prudential, and poly-prudential or poly-modal regulation can also be constructed to bring financial markets, institutions, and authorities together more closely and allow separate regulatory and policy authorities to coordinate their activities more closely on a domestic and cross-border basis. Underlying regulatory approaches can be refined to create more adaptive, embedded, and emergent methods and relations. Specific regulatory or control boxes

627. *The Compendium of Standards*, FIN. STABILITY BD., https://www.fsb.org/work-of-the-fsb/about-the-compendium-of-standards/ (last visited July 29, 2020).

628. *Id.*; *Key Standards for Sound Financial Systems*, FIN. STABILITY BD., https://www.fsb.org/work-of-the-fsb/about-the-compendium-of-standards/key_standards/ (last visited July 29, 2020); *see* G.A. Walker, *International Financial Instability and the Financial Stability Board*, 47 INT'L LAW. 1, 36 (Summer 2013).

629. *See* discussion *supra* Section VII.G.

630. *See* discussion *supra* Section V, VII.A–VII.H, VII.L.

and regulatory or policy zones can be used to bring all of this work within a single integrated framework. This could also incorporate a specific Global Financial regulatory Network (GFrN) or Global Regulatory & enforcement Network (GReN). A separate new Compendium and Directory of relevant international and national FinTech and RegTech standards could be produced. New challenges bring new opportunities.

VIII. Libra Close

Facebook has undertaken a bold initiative with the launch of Libra coin in 2019 and with the proposed Libra Association and Novi wallet service. This attempts to draw many of the post-Bitcoin lessons and insights in the area of digital coin design and evolution together to create a new digital currency model that may potentially realise the maximum benefit for all users and interest groups across the globe on a stable coin basis. This could bring substantial financial, economic, and social welfare advantage. This may benefit markets in terms of digitalisation, dematerialisation, disintermediation, privatisation, and monetisation. Individuals may benefit from the mobilisation, personalisation, socialisation, and democratisation of new financial tools. Technology can also increase speed, capacity, efficiency, and flexibility and reduce latency (delay) and costs. This can increase security and accessibility, durability and immutability, resilience and continuity, consistency and transparency, control and confidence, interoperability, and innovation and evolution.

The stated aspirations of Libra and the Libra Association are to be fully supported in assisting the unbanked and removing disadvantage. This could have a major developmental impact across the world as many still struggle to realise the benefits and opportunities that private market models provide. This may assist improve financial inclusion, and financial literacy, and capability. This may reduce the costs of international remittance services. Libra may also assist solve the specific problems of creating effective common digital identification systems that allow control and portability of personal data across the world. These would be remarkable achievements.

Substantial concerns and difficulties nevertheless remain with regard to legal, regulatory, technical, and wider social and policy issues. All of this should be fully resolved. The legal and regulatory nature of the coin has to be confirmed and compliance with all relevant laws and regulations secured. The technical papers produced refer to many of the continuing obstacles that arise with regard to full distributed ledger technology and blockchain development including in relation to security, accessibility, reconciliation, scalability, and governance. It remains to be seen whether Libra can fully resolve all of these outstanding operational and technology challenges. A series of wider policies also arise with regard to, in particular, competition, innovation, and regulatory balance. Domestic monetary policy, taxation, data protection and data exchange, surveillance and global financial security issues, and other international monetary stability and global financial

security issues must also be fully protected. It is essential that all of this is considered and drawn together into a coherent whole. Facebook and Libra have created a fundamental global challenge that requires an equally significant common progressive and comprehensive global solution.

Some may further consider that Libra may amount to a challenge to national sovereignty or, at minimum, national monetary control. Some may argue that it threatens the nation state and Westphalian-based world order. It may also challenge more progressive Liberal and Neo-Liberal regimes within a new post-technology, multi-polar, multi-functional, and multi-layered financial ecosystem and data system or data biome. A new virtual and globally accessible, technology, and data driven world has been created that requires the construction of a new multi-level control and governance system based on a new relationship between computer code and official law and regulation. Facebook did not create this problem but has simply drawn attention to the need for appropriate focus and action. It is necessary to develop a new complete or total technological solution in response to the challenges created by the relentless advance and integration of BigTech, DataTech, FinTech, CoinTech, TokenTech, StableTech, and RegTech and with further innovation to follow in FutureTech more generally.

The release of Libra by Facebook would be a significant global event. The effect of its proposed launch has already been to challenge domestic authorities to assess fully all of the implications of the potential creation of a global digital currency model for the first time. Whether Libra succeeds, and in which specific form or in which particular countries or territories, this will have assisted bring people, firms, and authorities together within and between countries to confront all of the relevant issues that arise and to develop an effective, coordinated, and coherent combined response. This has created a new dawn in international regulatory cooperation and control. Whether Libra and LibraTech can secure all of the high technical objectives set and equally ambitious social aspirations and expectations raised remains to be seen.