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The Law of Central Bank Reserve Creation

Will Bateman*  and Jason Allen†

This article explores legal and constitutional dimensions of central banks' powers to create money, 'central bank reserves', through monetary policy operations. Despite the prominence of monetary authority since the Financial Crisis, the law supporting the creation of central bank reserves is very obscure, as is the role of law in structuring constitutional authority over money. We de-mystify those important matters in three steps. First, we explain, for a legal audience, the role of central bank reserves in the financial system and broader economy. Secondly, we analyse the legal basis for the creation of central bank reserves in three prominent 'North Atlantic' monetary jurisdictions: the US Dollar, Euro and Sterling systems. Thirdly, we show how the legal structure of central banking intermediates the constitutional state's authority over money through parts of the financial system, focusing on high-profile policy proposals, including 'QE for the people', and the creation of central bank digital currencies.

The monetary world is often divided into three types: currency (notes and coins); central bank money (or central bank reserves); and private credit money (deposits or loans).¹ Within that division, central banks have sole legal authority to create bank notes and central bank reserves, and they guide the creation of private credit money by commercial banks. For the last decade, monetary policy has been defined by outright asset purchases funded by central bank money, leading to the creation of vastly more reserves than notes and coins, in the Dollar, Euro and Sterling monetary systems.²

Despite their recent celebrity, central bank reserves appear to be legal orphans, at least when compared to currency and private credit money.

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- 1 See for example M. McLeay, W. Radia and R. Thomas, 'Money Creation in the Modern Economy' Bank of England Quarterly Bulletin No 1/2014 (14 March 2014).
- 2 Central banks throughout the world have also adopted similar asset purchasing policies as emergency responses to the Covid19 pandemic: P. Cavallino and F. De Fiore, 'Central banks' response to Covid-19 in advanced economies' Bank of International Settlements Bulletin, No 21 (5 June 2020).

Legislation governing currency follows patterns familiar to lawyers and accessible by the citizenry. Statutory power is conferred on public institutions to issue notes or mint coins, and that physical currency is designated as legal tender: the state-sanctioned medium of exchange.³ Legal power to create private credit money is partly governed by the gargantuan statutes that regulate banks, via statutory permissions to take deposits and issue credit, and partly governed by the general law of contract, debt and property.⁴

Central bank reserves have no obvious legal parentage. No US, UK or Eurosystem statute explicitly confers power on the Federal Reserve Banks (FRBs), Bank of England, European Central Bank (ECB) or the National Central Banks of the Eurosystem (NCBs) to create or retire reserves. On the contrary, in each of those monetary systems the only explicit legal authority to create reserves lies in general law powers of commercial banks to deposit (whether mandatorily or voluntarily)⁵ funds into accounts held at the central bank. For this reason, the source of central banks' power to create reserves is highly obscure.⁶ This is an unsatisfactory position given the vital importance of central bank reserves to monetary policy,⁷ economic policy,⁸ political debate⁹ and financial entities' earnings.¹⁰

To shed some light in dark corners, our core inquiries and claims in this article are threefold. First, we explain the centrality of central bank reserves to modern central banking and the broader economic system for a legal audience. That explanation covers the role of reserves in the payments system, the settlement of inter-bank debts and the execution of monetary policy. The latter topic is particularly salient, given the prominence of 'unconventional' monetary

3 For Sterling-denominated bank notes and coins, see Currency and Bank Notes Act 1954 (2 & 3 Eliz II, c 12), ss 1 and 3; Coinage Act 1971 (UK), ss 3 and 4; for US Dollar-denominated currency, see Federal Reserve Act 1913 (US), s 16(1) (12 USC §411); 31 USC §5112; for Euro-denominated currency, see Treaty on the Functioning of the European Union, Art 128; Protocol (No 4) on the Statute of the European System of Central Banks and of the European Central Bank (ECB Statute), Art 16.

4 For US federal banking legislation, see 12 USC chapter 2; for the UK, see Financial Services and Markets Act 2000 (UK), ch 3; for the general law which applies to the creation of deposits by commercial banks, see R. Cranston et al, *Principles of Banking Law* (Oxford: OUP, 2018) 160; *Bank of Marin v England* 385 US 99, 101 (1966); *Citizens Bank of Maryland v Stumpf* 516 US 16, 21 (1995); *Foley v Hill* (1848) 2 HLC 28 [9 ER 1002].

5 As we explain below, the US and EU have mandatory 'reserve requirements', while the UK does not: see text accompanying n 55 below and following.

6 The major anglophone texts on monetary law only touch briefly on central bank reserves: S. Gleeson, *The Legal Concept of Money* (Oxford: OUP, 2018) 4.41, 6,10-6,12, 6.58; C. Proctor, *Mann on the Legal Aspect of Money* (Oxford: OUP, 7th ed, 2012,) 2.75-2.76, 33.57.

7 U. Bindseil, *Monetary Policy Operations and the Financial System* (Cambridge: Cambridge University Press, 2014) ch 2; Bank of England, 'Liquidity Insurance at the Bank of England' Media Release, October 2013 at <https://www.bankofengland.co.uk/-/media/boe/files/markets/sterling-monetary-framework/liquidity-insurance-at-the-boe.pdf>.

8 W. Buitter 'The Simple Analytics of Helicopter Money: Why It Works – Always' (2014) 8 *Economics: The Open-Access, Open-Assessment E-Journal* 1.

9 A. Jackson and B. Dyson, *Modernising Money: Why Our Monetary System Is Broken and How It Can Be Fixed* (London: Positive Money, 2012).

10 M. Demertzis and G.B. Wolff, 'What Impact Does the ECB's Quantitative Easing Policy Have on Bank Profitability?' Policy Contribution No 20 (Brussels: Bruegel, 2016); J. Montecino and G. Epstein, 'Have Large Scale Asset Purchases Increased Bank Profits?' Institute for New Economic Thinking Working Paper No 5 (March 2015).

policy over the past decade in the form of ‘quantitative easing’ (QE) operations. While some of those details will be familiar to financial-market participants, they are less well known by legal scholars, despite being critical preconditions to understanding the significance of the legal frameworks governing the creation of central bank reserves and the nature of constitutional authority over money.

Secondly, we ask ‘what legal authority supports the creation of central bank reserves?’ Our answer, ‘it depends’, reflects the organisational complexity of modern central banking. Two distinct pathways lead to the creation of central bank reserves. First, commercial banks create central bank reserves by exercising general legal powers to lend money to central banks by making deposits into reserve accounts. Secondly, central banks create reserves as a consequence of exercising statutory powers to ‘purchase’, ‘sell’, ‘buy’ or ‘deal in’ securities with, or ‘lend’ to, financial market counterparties. In both cases, legal rules relating to settlement finality shore up the function of central bank reserves as an apex settlement asset in the relevant monetary system. This being the case, we argue that central banks’ legal authority to create reserves is best characterised as *implied* or *incidental* to central banks’ express powers to transact in financial markets. We explain why those two regimes co-exist, and note some complexities of that co-existence, including accounting for reserves as liabilities and paying interest on excess reserves, despite the fact that the overwhelming majority of reserves are monetary units made by central banks, rather than deposits of commercial banks.¹¹

Thirdly (in conclusion), we ask ‘what impact does the legal basis of central bank reserve creation have on the exercise of *monetary authority*: the power of states to create, retire and control the value of money?’ We answer that question by explaining the role of law in intermediating monetary authority through the private financial system: legal institutions presently cabin basic authority over money by reference to various fixed features of financial markets: willing counterparties, marketable financial assets and consensual bargaining. We call this ‘intermediated monetary authority’ and illustrate its basic features by reference to central bank operations in response to emergencies: the financial crisis and the Covid-19 pandemic. We then explain the impact of that form of monetary authority on several presently prominent topics in legal, financial and political engagements with central banks: (i) the relationship between central banks’ legal capacities and their ‘mandates’; (ii) the notion that central banks are ‘magic money trees’; and (iii) proposals for the issue of digital currencies by central banks to non-financial firms and the general public. In that way, our descriptive legal analysis of central banks is linked to foundational issues in the design of constitutional institutions and major public policy choices confronting national governments, central banks and each populace to which they are ultimately accountable.

Our close analysis of the law of central bank reserve creation is undertaken in light of the increased public awareness of central bank operations since the adoption of unconventional monetary policy techniques, particularly QE.

11 See D. Archer and P. Moser-Boehm, ‘Central Bank Finances’ BIS Papers No 71 (April 2013).

While technical economic literature tends to focus on the asset purchasing side of QE and its impact on balance sheets,¹² more popular accounts focus on the deployment of central bank reserves in QE as an act of money creation.¹³ Despite that prominence, there is no literature addressing the legal framework surrounding central bank reserve creation and the impact of that framework on the exercise of monetary authority. This article is intended to fill that gap by reference to the three major monetary jurisdictions of the ‘North Atlantic’ financial system.¹⁴ In so doing, we build on the work of central bank specialists concerning the legal basis of monetary policy, the constitutional position of central banks and the balance of power between the public and private financial systems.¹⁵

SYSTEMIC FUNCTIONS OF CENTRAL BANK RESERVES

From the perspective of the general public and the law courts, the most prominent form of central-bank issued money is physical currency in the form of bank notes.¹⁶ Legal treatments of money have reflected that prominence, exploring the legal status and character of bank notes in exquisite detail.¹⁷ From the perspective of economic policy-makers and financial-market actors, the only

12 See for example V. Curdia and M. Woodford, ‘The Central Bank Balance Sheet as an Instrument of Monetary Policy’ National Bureau of Economic Policy Working Paper No 16208 (July 2010); C. Pattipeilohy, ‘A Comparative Analysis of Developments in Central Bank Balance Sheet Composition’ Bank of International Settlements Working Paper No 559 (April 2016).

13 See for example McLeay, Radia and Thomas, n 1 above.

14 For the significance of the idea of ‘North Atlantic Finance’ to domestic and international politics and constitutionalism, see: A. Tooze, *Crashed: How a Decade of Financial Crises Changed the World* (London: Penguin, 2019) ch 3; T. Bayoumi, *Unfinished Business: The Unexplored Causes of the Financial Crisis and the Lessons Yet to be Learned* (Cambridge, MA: Yale University Press, 2017) Part I.

15 R.M. Lastra, *International Financial and Monetary Law* (Oxford: OUP, 2006) ch 2; C.A.E. Goodhart and R.M. Lastra, ‘Populism and Central Bank Independence’ (2018) 29 *Open Economics Review* 49; D. Small and J. Clouse, ‘The Scope of Monetary Policy Actions Authorized under the Federal Reserve Act’ Board of Governors of the Federal Reserve System Working Paper (19 July 2004); M. Friedman and C.A.E. Goodhart, *Money, Inflation and the Constitutional Position of the Central Bank* (London: Institute for Economic Affairs, 2003); P. Conti-Brown, ‘The Institutions of Federal Reserve Independence’ (2015) 32 *Yale Journal of Regulation* 257; R. Hockett and S.T. Omarova, ‘The Finance Franchise’ (2017) 102 *Cornell Law Review* 1143.

16 Coins are also currency and the legal framework governing them is replete with esoteric legal issues: see for example Proctor, n 6 above, 1.18–1.27. We put coins aside here for two reasons: (i) in most jurisdictions they are not issued by a central bank, but by a national treasury or mint (an exception is the Eurosystem); and (ii) they make a negligible contribution to modern economic life: for example in January 2020 the face value (and proportional share) of central bank issued money in the Eurozone stood at: ~€300billion coins (one per cent of the face value of monetary instruments issued by the ECB); ~€1.2trillion bank notes (40 per cent of the total); and ~€1.8trillion central bank reserves (60 per cent of the total); data from https://www.ecb.europa.eu/stats/policy_and_exchange_rates/banknotes+coins/circulation/html/index.en.html; <https://www.ecb.europa.eu/pub/annual/balance/html/index.en.html>.

17 See for example J.S. Rogers, ‘Early English Law of Bank Notes’; H. Siekmann, ‘Deposit Banking and the Use of Monetary Instruments’; K.G.C. Reid, ‘Banknotes and their Vindication in Eighteenth-Century Scotland’ all in D. Fox and W. Ernst (eds), *Money in the Western Legal Tradition* (Oxford: OUP, 2016).

type of ‘public’ money which really matters are the credit balances in the accounts held by commercial banks at the central bank: ie central bank reserves. In this opening part, we explain (for a legal audience) the significance of central bank reserves to the economic and financial system, before commencing our analysis of the law which supports their creation.

Central bank reserves serve two critical economic functions, namely, as the apex ‘settlement asset’ in the payments system and the administrative item through which monetary policy operations are executed.

Central bank reserves as inter-bank settlement assets

Legal entities in the both the financial and non-financial economies (individuals and corporations) can use various forms of money to execute their economic transactions. They can use currency (notes and coins), other money-like commodities (say, gold or letters of credit) or book entries in the accounts of commercial banks at which they hold accounts. Measured by economic value, most payments are made by book-entries in deposit accounts of commercial banks.¹⁸ In that sense, payments for the (vast) majority of value-weighted economic transactions occur via the accounts of customers held at commercial banks.

In any 24-hour period, payments via bank accounts produce asymmetric settlement obligations of debit and credit for commercial banks: some of that asymmetry arises from banks’ customers’ transactions and some arises from the conscious choices of commercial banks. Bank customer payments create unpredictable levels of credits/debits in the commercial banking system because on some days, for example, more HSBC customers have credited the accounts of Barclays’ customers, than Barclays customers have credited HSBC’s customers’ accounts, leaving Barclays with a net liability to HSBC.¹⁹ Banks will also experience liquidity shortfalls as a result of various profit-seeking activities, including ‘maturity mismatches’ in their balance sheets which arise from cashflow gaps between receipts from higher-interest rate (long) bank-lending and outgoings on lower-interest rate (short) bank-borrowing.²⁰

Commercial banks can meet their payment/settlement obligations in various ways. They can draw on cash reserves, borrow money from other commercial banks (inter-bank lending), sell assets (often economically identical to inter-bank lending) or they can borrow money from the central bank.²¹ If the

18 Because data on the precise mixture of different payment media is scarce, that statement is inferred from the fact that deposit balances in commercial banks far exceed the face value of bank notes on issue: McLeay, Radia and Thomas, n 1 above, 15.

19 See generally, T. Kokkola (ed), *The Payment System: Payments, Securities and Derivatives, and the Role of the Eurosystem* (Frankfurt am Main: European Central Bank, 2010) ch 1.

20 The financial rationale and economic effects of those mismatches are discussed in: M. Stigum and A. Crescenzi, *Stigum’s Money Market* (McGraw-Hill Education, 4th ed, 2007); Kapadia *et al*, ‘Liquidity Risk, Cash-Flow Constraints and Systemic Feedbacks’ Bank of England Working Paper No 456 (June 2012).

21 Hypothetically, banks could also issue equity to obtain settlement funds, although the time-critical nature of payments systems would likely make that an impossibility.

last option is selected, the central bank generates the loan proceeds through the creation of central bank reserves, crediting the account of the commercial bank in need of bridging finance,²² and the commercial bank then credits the reserve account of the bank to which it owes an outstanding settlement balance. The debts between the banks are 'settled' because they accept the exchange of central bank reserves as final satisfaction of their respective financial obligations.²³ Those reserves are the 'apex' form of settlement asset, because central banks (unlike commercial banks) are unlimited in the amount of reserves they can provide commercial banks seeking to settle. In that way, central bank reserves are a form of government-provided 'liquidity insurance': monetary units issued by a central bank to commercial banks and other financial entities which have temporary shortfalls of cashflow.²⁴

The label 'reserves' attaches to those monetary units as a result of the historical usage of central bank accounts as pools of funds held by commercial banks in 'reserve' of their payment liabilities under systems of fractional reserve banking.²⁵ Legal requirements to maintain credit balances in those reserve accounts (reserve requirements) as liquidity back-stops were gradually diluted throughout the 20th century,²⁶ and many monetary systems do not require commercial banks to hold fractional reserves.²⁷ Despite reserve requirements now being obsolete, the monetary units in central bank accounts are still referred to as 'reserves', and the accounts into which they are transferred are called variously 'reserves' and 'settlement' accounts²⁸, 'Master Accounts',²⁹ or, simply, 'current accounts'.³⁰ Whatever the terminology, ultimate settlement of inter-bank payment obligations occurs through the transfer of those monetary units (reserves) between accounts maintained at the central bank.

22 Liquidity is provided to a broader set of financial sector counterparties, most prominent investment banks and securities dealers that specialise in the sovereign debt markets: see n 36 below.

23 We explain the legal basis of 'settlement', n 81 below *et seq.* For an admirably clear account from the financial system perspective, see Kokkola, n 19 above, chs 1, 6 and 7.

24 Bank of England, 'Liquidity Insurance at the Bank of England' Media Release, October 2013 at <https://www.bankofengland.co.uk/-/media/boe/files/markets/sterling-monetary-framework/liquidity-insurance-at-the-boe.pdf>. For the mechanics behind those applications of central bank reserves, see Committee on Payment and Settlement Systems, Bank of International Settlements, 'The Role of Central Bank Money in Payment Systems' Report, August 2003 at <https://www.bis.org/cpmi/publ/d55.pdf>.

25 See, Hockett and Omarova, n 12 above, 1152 citing C.A. Phillips, *Bank Credit: A Study of the Principles and Factors Underlying Advances Made by Banks to Borrowers* (New York, NY: Macmillan, 1920) 165-169; P. Samuelson and W. Nordhaus, *Economics* (McGraw-Hill, 2009, 19th ed) 464-465; J. Stiglitz, *Economics* (New York, NY: W.W. Norton & Co, 2d ed, 1997) 732-734.

26 See U. Bindseil, *Monetary Policy Implementation: Theory, Past and Present* (Oxford: OUP, 2005) ch 6.

27 Where reserve requirements still exist, they are viewed as a monetary policy tool, rather than a fractional-reserve liquidity back-stop: see generally Y.-Y.C. O'Brien, 'Reserve Requirement Systems in OECD Countries' Finance and Economics Discussion Series, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, 2007-54 (23 July 2007).

28 As in the UK, see Bank of England, 'RTGS Account Mandate Terms and Conditions'.

29 As in the US, see Federal Reserve Bank, 'Operating Circular 1' at <https://www.frbservices.org/resources/rules-regulations/operating-circulars.html>.

30 As in the Bank of Japan, see Institute for Monetary and Economic Studies, *Functions and Operations of the Bank of Japan* (Tokyo: Bank of Japan, 2012) 104.

Central bank reserves and monetary policy operations

Central bank reserves are also critical to the functioning of monetary policy, being the policies adopted by governments and central banks to influence the volume and price of credit in order to achieve various economic and social objectives: stable prices, maximum employment and rescue measures in moments of economic crises.³¹ Monetary policy takes different forms at different times, in different jurisdictions,³² but in the monetary systems of the North Atlantic, an influential division has developed between conventional (pre-financial crisis) and unconventional (post-financial crisis) monetary policy.³³

Conventional Monetary Policy

Pre-financial crisis, ‘conventional monetary policy’ generally referred to the achievement of stable inflation (price stability), with a two per cent annual growth rate in the price of consumer goods as a typical target.³⁴ Central banks sought to hit that target by setting interest rates in the financial economy through influencing the rate at which commercial banks could obtain finance on the inter-bank market or from the central bank.³⁵

Interest-rate targeting was executed via several different types of transactions. The most common were ‘repo’ transactions: contracts for the sale and re-purchase of securities (often government bonds) by a discrete set of counterparty banks or securities dealers.³⁶ Repo transactions provided

31 Goals reflected, with varying precision, in some central bank’s legal ‘mandates’: Federal Reserve Act 1913 (US), s 2A; Treaty on the Functioning of the European Union, Art 127; Bank of England Act 1998 (UK), s 11.

32 For the pre-20th century history of monetary policy, see Bindseil, n 7 above, 43–44; M. Friedmann and A. Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton, NJ: Princeton University Press, 1971) 127–128, 151–152; U. Bindseil, *Central Banking Before 1800: A Rehabilitation* (Oxford: OUP, 2019).

33 See for example Bank of International Settlements, ‘Unconventional monetary policy tools: a cross-country analysis’ Committee on the Global Financial System Papers No 63 (October 2019) 8–9; P. Conti-Brown, *The Power and Independence of the Federal Reserve System* (Princeton, NJ: Princeton University Press, 2016) ch 6; U. Bindseil, ‘Evaluating Monetary Policy Operational Frameworks’ 31 August 2016, 6 at <https://www.kansascityfed.org/~media/files/publicat/sympos/2016/econsymposium-bindseil-paper2.pdf?la=en>.

34 See for example the published minutes of the meeting of the ECB’s Governing Council (13 October 1998): ‘Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2 per cent’ at https://www.ecb.europa.eu/press/pr/date/1998/html/pr981013_1.en.html; The two per cent target endured past the crisis: Federal Open Market Committee, ‘Federal Reserve issues FOMC statement of longer-run goals and policy strategy’ at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20120125c.htm>; Bank of England, ‘Inflation and the 2 per cent Target’ at <https://www.bankofengland.co.uk/monetary-policy/inflation>.

35 Bindseil, n 7 above, ch 4. For excellent accounts of pre- and post-crisis monetary policy from a legal perspective, see Lastra, *International Financial and Monetary Law*, n 15 above, chs 2 and 7, Conti-Brown, n 15 above, ch 6–7; Proctor, n 6 above, 2.76

36 Most monetary policy operations in the US and UK are limited to a very select group of financial sector counterparties that market-make in sovereign debt markets (in the UK: ‘Gilt-Edged Market Makers’ at <https://www.dmo.gov.uk/responsibilities/gilt-market/market-participants/#:~:text=A%20Gilt%20Dedged%20Market%20Maker>,

‘overnight’ financing for commercial banks,³⁷ and the difference between the sale and re-purchase price of a security represented the interest rate on central bank credit which underpinned headline interest rates transmitted to the broader financial system via supply and demand dynamics in the inter-bank lending market.³⁸ Interest rates were also targeted through direct lines of credit to commercial banks, sometimes called ‘discount window’ facilities, through which central banks lent reserves to commercial banks on a collateralised basis.³⁹ Like the difference between sale and purchase price in repos, the interest rate of those credit facilities represented the interest rate on central bank credit which could pass through into the general economy via money market dynamics.

Finally, conventional monetary policy was also legally executed by central banks making outright purchases/sales of financial assets to provide/absorb liquidity in the inter-bank market, and thus influencing the credit-offering behaviour of commercial banks.⁴⁰ Purchasing assets (usually government bonds) from commercial banks lead to a durable increase in the number of reserves in their accounts, and a longer-term easing of frictions in the inter-bank market, making banks more likely to lend. By remaining on central bank balance sheets indefinitely, outright purchases were distinct to repo, but their volume was less economically significant.⁴¹

Unconventional Monetary Policy

During the financial crisis, commercial banks ceased lending to one another and central banks were forced to lower interest rates close to, or nominally below, zero per cent: the ‘zero-lower bound’.⁴² Thereby, the primary tool for influencing price stability was sterilised and the operational tools for interest targeting fell into disuse: repo transactions radically decreased, and standing

anonymous%20trading%20between%20market%20makers. and in the US: ‘Primary Dealers’ at <https://www.newyorkfed.org/markets/primarydealers>). The group of eligible monetary policy counterparties in the Eurosystem is far broader: Task Force on the Use of Monetary Policy Instruments, ‘The use of the Eurosystem’s monetary policy instruments and its monetary policy implementation framework Q2 2016 – Q4 2017’ European Central Bank Occasional Paper Series No 209/April 2018.

- 37 Although ‘term’ repos were also conducted, with holding periods of up to three months: see the entries for longer-term repos in the balance sheets of the Federal Reserve System, the ECB and the Bank of England: Bindseil, n 7 above, 232–234.
- 38 That is a necessary simplification of the deep complexity of interest-rate setting operations. For accessible explanations of the ways that central banks executed interest rate setting through repos, see A. Kroeger, J. McGowan and A. Sarkar, ‘The Pre-Crisis Monetary Policy Implementation Framework’ Staff Report No 809, Federal Reserve Bank of New York (May 2018) and Bindseil, n 26 above, chs 4 and 5.
- 39 For the various types of ‘discount window’ transactions, see Bindseil, *ibid*, 106–108.
- 40 On the role of outright transactions pre-crisis see Kroeger, McGowan and Sarkar, n 38 above, 10; Bindseil, *ibid*, 153–156.
- 41 Taking the US as an example, in 2004 only \$50billion of securities were purchased outright, compared to \$1.5trillion of repo transactions: Kroeger, McGowan and Sarkar, *ibid*, 10.
- 42 For masterful accounts of the ultimate and proximate causes of the financial crisis, see Tooze, n 14 above, Parts I and II; Bayoumi, n 14 above, Part I. For more detailed economic treatment, see L. Gambacorta, B. Hofmann and G. Peersman, ‘The Effectiveness of Unconventional Monetary Policy at the Zero Lower Bound: A Cross-Country Analysis’ (2014) 46 *Journal of Money, Credit and Banking* 615.

facilities were deployed to bail-out banks, rather than set-interest rates.⁴³ Mid- and post-crisis, ‘unconventional monetary policy’ assumed a more nebulous set of goals, including: ensuring the inter-bank credit market continued to operate; making markets for highly-distressed asset classes (such as mortgage-backed securities in the US); preventing deflationary pressures from overwhelming the general economy; and fighting against the collapse of the payments system. The principal method for achieving those diverse objectives was to purchase debt securities on an enormous scale: QE.⁴⁴

The net impact and efficacy of QE as a transmission mechanism for monetary policy are topics of continuing discussion,⁴⁵ and central banks’ own explanations of QE’s objectives have subtly changed over time.⁴⁶ Despite those shifting sands, two objectives have appeared to be relatively stable although they remain debated: increased liquidity in both the banking system and the general economy;⁴⁷ and re-allocating private-sector asset portfolios, as the price of assets purchased through QE shifted relative to assets excluded from QE.⁴⁸

Legally, QE was structured as simply an expanded program of outright purchases and in that sense was a continuation of conventional monetary policy operations. A similar mix of debt securities were purchased by central banks and the counterparties for QE trades were the large commercial banks and securities dealers that were repo counterparties in more conventional times. Economically, financially, and politically, however, QE represented a landmark change for modern central banks, as the volume of assets purchased and the volume of central bank reserves created to fund those purchases were several orders of magnitude greater than the outright purchases of conventional monetary policy operations.

43 For a non-technical multi-jurisdictional analysis of the relationship between financial crises and unconventional monetary policy, see S. Potter and F. Smets, ‘Unconventional monetary policy tools: a cross-country analysis’ Committee on the Global Financial System Papers No 63, Bank of International Settlements (October 2019).

44 Various iterations of repo and standing facilities continued to exist after the adoption of QE: see for example the Federal Reserve’s ‘Primary Dealer Credit Facility’ Federal Reserve Bank of New York, Term Sheet for Primary Dealer Credit Facility, 17 March 2020 at <https://www.federalreserve.gov/newsevents/pressreleases/files/monetary20200317b1.pdf>, the Eurosystem’s ‘Targeted Longer-Term Refinancing Operations’ (Guideline (EU) 2015/510 of the ECB of 19 December 2014 on the implementation of the Eurosystem monetary policy framework (ECB/2014/60), Art 7); and the Bank of England’s ‘Discount Window Facility’, ‘Operational Standing Facilities’ and ‘Contingent Term Repo Facility’ Bank of England, ‘Sterling Monetary Framework: SMF Operating Procedures’ (3 June 2019)).

45 Samples of that discussion over the last three years are collected in B. Broadbent, ‘The History and Future of QE’ Speech given to the Society of Professional Economists, London, 23 July 2018, fn 16 and A. Haldane, M. Roberts-Sklar, T. Wieladek and C. Young, ‘QE: The Story so Far’ Bank of England Staff Working Paper No 624 (19 October 2016).

46 A collection of transmission mechanisms for QE can be found in S. Potter, ‘The Federal Reserve’s Experience Purchasing and Reinvesting Agency MBS’, Remarks at the Bank of England, London (7 March 2019).

47 J. Gagnon, M. Raskin, J. Remache and B. Sack, ‘Large-Scale Asset Purchases by the Federal Reserve: Did They Work?’ Federal Reserve Bank of New York Staff Reports No 441 (March 2010); J. Christensen and J. Gillan, ‘Does Quantitative Easing Affect Market Liquidity?’ Federal Reserve Bank of San Francisco Working Paper No 26/2013 (December 2019).

48 Sources are collected in Broadbent, n 45 above, 10.

The Federal Reserve's assets (ie the securities held on its balance sheet through repo and outright purchase) stood at ~five per cent of GDP in 2008; after five years of QE, they stood at ~20 per cent of GDP.⁴⁹ The same enormous expansion in central bank assets can be found in the UK (~five per cent of GDP in 2008; ~24 per cent in 2014)⁵⁰ and the Eurosystem (0.2 per cent in 2008; 39 per cent in 2019).⁵¹ QE also embroiled central banks in the fiscal fortunes of central governments, as the vast majority of assets purchased through QE programs were government debt securities. Between 2009 and 2019, around 20 per cent of US, Eurosystem and UK government debt became owned by the FRBs, the Eurosystem's NCBs and the Bank of England.⁵² Because QE asset purchases were funded by central bank reserves created by central banks, those asset purchases were mirrored by an equally momentous expansion in the supply of funds held by the financial sector.

For our purposes, the central bank reserve creation that underpinned QE exposed (to all observers outside the financial sector) the relative unimportance of physical currency (bank notes and coins) as the other type of 'public' money. Even before QE, central banks were creating reserve balances in quantities which vastly overshadowed the supply of physical currency to the non-financial economy. (Figure 1)

Figure 1 shows the gross amount of reserves created under conventional monetary policy operations through short-term repo (\$1.9 trillion) and outright security purchases (\$50 billion) transactions in the US, vs the face-value of Federal Reserve banknotes on issue (\$720 billion) in 2004.⁵³ As under QE, the US central bank issued vastly more reserves than notes, but the short-term nature of the financing transactions they supported meant that full extent of the reserve creation was not revealed on the annual balance sheet. The same proportional mix of reserves to banknotes was observable in comparable monetary systems before QE.⁵⁴ The critical point is to observe the emergence of central

49 Data from Federal Reserve Bank of St Louis FRED: Central Bank Assets to GDP for United States (DDDI06USA156NWDB) at <https://fred.stlouisfed.org/series/DDDI06USA156NWDB>.

50 Data from Federal Reserve Bank of St Louis FRED: Bank of England Balance Sheet – Total Assets in the United Kingdom (BOEBSTAUKA) at <https://fred.stlouisfed.org/series/BOEBSTAUKA>.

51 Data from Federal Reserve Bank of St Louis FRED: Central Bank Assets to GDP for Euro Area (DDDI06EZA156NWDB) at <https://fred.stlouisfed.org/series/DDDI06EZA156NWDB>; Wall Street Journal, 'Central Bank Watch' at <https://graphics.wsj.com/CentralBanks/>.

52 See the 'Bruegel database of sovereign bond holdings' developed by S. Merler and J. Pisani-Ferry, 'Who's afraid of sovereign bonds' Bruegel Policy Contribution 2012|02, February 2012 (updated 29 April 2020). Those holdings had precipitate impacts on the monetary financing of public expenditure by central banks: see further, W. Bateman, *Public Finance and Parliamentary Constitutionalism* (Cambridge: Cambridge University Press, 2020) ch 7 (Bateman, *Public Finance*); W. Bateman, 'The Law of Monetary Finance under Unconventional Monetary Policy' (2021) *Oxford Journal of Legal Studies* (advance) gqab008 at <https://doi.org/10.1093/ojls/gqab008>.

53 Repo and outright figures from FRBNY, 'Pre-Crisis Monetary Policy Implementation Framework', 10; figures on banknotes from Board of Governors of the Federal Reserve System, *Annual Report 2004*, 316. The figure displays total bank notes on issue, rather than bank notes issued in 2004: the latter was a much smaller number, further emphasising the relative insignificance of bank notes in comparison to reserves.

54 The same balance of currency and reserves generalises beyond the US. Pre-financial crisis in the UK, the Bank of England issued vastly more reserves for interest-rate setting operations

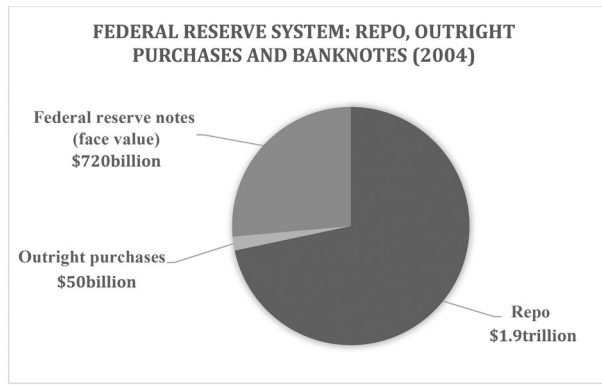


Figure 1: Pre-crisis monetary mix: Federal Reserve

bank reserves, rather than hard currency, as the apex public-monetary units of the contemporary financial system.

Central bank reserves in modern central banking

The following table provides an overview that reveals the centrality of central bank reserves to the functions of modern central banks:

Central bank function	Policy objective	Transaction	Use of central bank reserves (CBRs)
Payments/ settlement	Settlement facilities	Commercial banks borrow from central banks to settle debts	CBRs lent by the central bank to commercial banks
Payments/ settlement /monetary policy	Reserve requirements	Commercial banks deposit proportion of liabilities with central bank	CBRs lent by central banks to commercial banks/ deposited by commercial banks with the central bank
Conventional Monetary Policy	Interest-rate targeting	Repo transactions	CBRs are used to settle sale and re-purchase transactions
		Collateralised lending	CBRs are lent by the central bank to commercial banks
		Outright purchases	CBRs are used by the central bank to purchase assets
Unconventional Monetary Policy	Quantitative Easing	Outright purchases	CBRs are used by the central bank to purchase assets

Central Bank Reserves: Function, Policy, Transactions

Central bank reserves are critical to all functions of modern central banks. Most economic activity ultimately relies on a stable supply of central bank reserves

(£1.08trillion in 2006) compared to banknotes on issue (£36.9billion in 2006): repo data from Bank of England, Bankstats, YWDB23C, 'Daily changes of Central Bank sterling new weekly operations for monetary policy'; UK banknote data from Bank of England, *Annual Accounts 2006*, 110.

to the financial sector. If central banks stop issuing reserves, commercial banks cannot reliably settle their debts. If commercial banks cannot reliably settle their debts, individuals cannot make payments in the general economy. If payments cannot be made, the financial basis of economic exchanges is removed. In that sense, central bank reserves are the most important form of money directly controlled by public institutions. Despite that importance, the legal basis for reserve creation has never been clearly identified, nor has the role played by that law on the *constitutional status of monetary authority*. We turn to those tasks in the following two parts

LEGAL AUTHORITY FOR RESERVE CREATION

The law of central bank reserve creation has three central elements in the Dollar, Sterling and Euro zones:

- Deposits by commercial banks: commercial banks create credit balances in their reserve accounts by exercising legal powers to make deposits. This creates a legal relationship of creditor (commercial bank) and debtor (central bank).
- Loans and asset purchases by central banks: central banks create credit balances in reserve accounts as a consequence of exercising statutory powers to enter into transactions (to ‘buy’ securities and make ‘loans’ or ‘advances’) with financial market actors.
- Finality of central bank settlement: contractual and statutory law permits commercial banks to transfer credit balances in their reserve accounts finally to discharge their debts by making those transfers final and irrevocable both between the commercial banks and against third parties.

In this part, we explain the legal details of each element, explain how they co-exist in modern central banking, and observe some of the institutional and analytical complexities of that co-existence. The first two elements could be characterised as distinct ‘pathways’ to the creation of new central bank reserves, ie different ways of creating new Dollars, Pounds, or Euros on the balance sheet of the central bank, and hence on the balance sheet of commercial banks and ultimately in the broader economy. Both ‘pathways’ rely on the third element, settlement finality.

Reserve creation through commercial bank deposits

The most basic element of central bank reserve creation is the legal framework which permits commercial banks to make deposits into reserve accounts at central banks. As noted above, central bank accounts were historically used as pools of funds against commercial bank liabilities: liquidity back-stops under fractional reserve banking. Although that systemic function of reserves is obso-

lete, the legal framework underpinning it continues to be influential in modern central banks, as we explain by reference to US, Eurosystem and UK law.

In each jurisdiction, law facilitates reserve creation via commercial bank deposits in two ways: legal rules permitting or obliging commercial banks to open accounts at the central bank; and legal rules establishing a contractual relationship of debtor (central bank) and creditor (commercial bank) in respect of the contents of those accounts.

Legal Basis of Central Bank Reserve Accounts

The permission or obligation to open a central bank reserve account generally flows from legislative rules, supplemented by contracts between central and commercial banks governing the finer details of reserve account usage.

US legislation obliges commercial bank members of the Federal Reserve System to open reserve accounts with their FRB and to deposit a given ratio of their liabilities into those accounts. Since 1913, member banks have been obligated by (the frequently amended) section 19 of the Federal Reserve Act to ‘maintain reserves against [their] transaction accounts’ as prescribed by the Federal Reserve Board.⁵⁵ The ‘composition’ of those reserves ‘shall ... be in the form of ... balances maintained ... by such depository institution in the Federal Reserve bank of which it is a member or at which it maintains an account’.⁵⁶ The granular rules for those reserve accounts are provided by standard-form contracts issued by the FRBs.⁵⁷

Similar requirements can be identified in the Eurosystem, through a complex interplay of supra-national and national law. European law imposes general obligations on commercial banks to meet reserve requirements by making deposits at their NCB and assumes the existence of accounts into which those reserves can be deposited.⁵⁸ National law provides the granular rules concerning the system of accounts at the NCBs and the use of those accounts by commercial banks of the commercial banking system.⁵⁹ Like the US, the detailed rules of

55 Federal Reserve Act, s 19(b).

56 Federal Reserve Act, s 19(c), also confers permission to hold a proportion to reserves in vault cash. The same concepts carry through into Regulation D12 CFR §204: ‘(a)(1) A depository institution ... shall satisfy reserve requirements by maintaining vault cash and, if vault cash does not fully satisfy the institution’s reserve requirement, in the form of a balance maintained ... (i) In the institution’s account at the Federal Reserve Bank in the Federal Reserve District in which the institution is located.’

57 Federal Reserve Banks, ‘Operating Circular No 1: Account Relationships’ (effective 1 February 2013).

58 The ECB Statute, art 19(1) confers power on the ECB’s Governing Council to require banks to hold minimum reserves on account with their NCB. That power was relevantly exercised by Guideline (EU) 2015/510 of the European Central Bank of 19 December 2014 on the implementation of the Eurosystem monetary policy framework (ECB/2014/60). Reserve accounts are assumed to exist in all EU central banks in Directive 98/26/EC of the European Parliament and Council (19 May 1998) on settlement finality in payment and securities settlement systems. For the pre-Euro position in major European central banks, see U. Bindseil, ‘Reserve Requirements and Economic Stabilisation’ Deutsche Bundesbank Discussion Paper 1/97 (January 1997).

59 See for example Article 141–8 of the *Code monétaire et financier* (for the Banque de France); §22 of the *Bundesbankgesetz* and VG Frankfurt am Main, Urteil vom 11.02.2010 – 1 K 2319/09.F.

reserve accounts at the NCBs are provided by contracts between the NCBs and commercial banks.⁶⁰

The same mix of legislation and contract undergirds reserve accounts in the UK. Access to accounts at the Bank of England is voluntary, and the relationship between the central bank and commercial banks is governed by contract. Banks wishing to have access to the UK's apex payments settlement system are obliged by contract with the Bank of England to open and maintain a Sterling denominated current account at the central bank,⁶¹ and monetary policy counterparties (repo and outright purchase transactions) treat that current account as a 'reserve account'.⁶² The Bank of England provides, operates, and supervises the digital infrastructure underlying UK's apex wholesale payments settlement system, the 'clearing house automated payments system' (CHAPS).⁶³ In that way, reserve accounts are used to settle interbank debts and receive central bank reserves issued through repo, loans and asset-purchase transactions.⁶⁴

While the legal framework of reserve accounts in the UK appears largely contractual, it operates within a broader system of parliamentary legislation. The Financial Markets and Insolvency (Settlement Finality) Regulations 1999 allows for CHAPS to be mandated as a 'designated system' for settling transactions and the Financial Services (Banking Reform) Act 2013 (UK) regulates CHAPS as a payment system. To that extent, reserve accounts in the UK (as in the US and Eurosystem) are ultimately regulated by legislation.

Legal Basis of Deposit Balances in Central Bank Accounts

Each of the US, UK and Eurosystem legislative frameworks assumes that reserve accounts receive deposits by commercial banks with central banks, rather than monetary units created by central banks and transferred to commercial banks. That legal position is reflected in central bank accounting treatments of reserve accounts as 'deposit' accounts.⁶⁵ In that way, the deposit pathway of central bank reserve creation mirrors the legal treatment of deposits at commercial banks.

60 See for example 'General Terms and Conditions of the Deutsche Bundesbank' Banking Regulations 5, 1 January 2019), in English translation at <https://www.bundesbank.de/resource/blob/618354/a269ec70dc21688e3444d027d19e94da/mL/bundesbank-gtc-data.pdf>; and the Banque de France's TARGET2-Banque de Franc Agreement, in English translation at https://www.banque-france.fr/sites/default/files/media/2016/11/09/2016-10-25_convention_pm_psr_en.pdf.

61 *CHAPS Reference Manual* 29 March 2019, [2.1.1]. The amount of reserves deposited into that account is in the discretion of a CHAPS member bank, but must be sufficient to meet that bank's settlement obligations.

62 Bank of England, 'RTGS Account Mandate Terms and Conditions' and 'Reserves Account Annex' (February 2019); Bank of England, 'Sterling Monetary Framework: SMF Operating Procedures' (3 June 2019); Bank of England, 'Terms and Conditions for Participation in the Bank of England's Operations under the Sterling Monetary Framework' (18 March 2019).

63 Meaning 'Clearing House Automated Payments System' for which terms and conditions for participation are provided in the Bank of England RTGS Account Mandate Terms and Conditions (February 2019).

64 Bank of England, 'Bank of England Settlement Accounts' (March 2019), [18]; Bank of England, 'SMF Operating Procedures' (3 June 2019), [3.13].

65 See for example Board of Governors of the Federal Reserve System, *Federal Reserve Banks Combined Financial Statements for the Years Ending December 31, 2019 and 2018 and Independent Auditors*

In Anglophone common law jurisdictions, a deposit is legally modelled as a loan from the customer to the bank upon which interest is paid: the legal relationship created upon deposit is one of creditor (customer) and debtor (banker).⁶⁶ So much has been explicitly recognised by the US Supreme Court: '[t]he relationship of bank and depositor is that of debtor and creditor, founded upon contract',⁶⁷ with the consequence that receiving a deposit 'consists of nothing more than a promise to repay, from the bank to the customer.'⁶⁸ English courts have been equally clear, stating that the obligation of a banker to a depositor is one of 'money lent'.⁶⁹

Major Eurosystem jurisdictions characterise bank deposits in a broadly similar way, through the Civilian category of the 'irregular deposit'.⁷⁰ Where a depositary must usually return the deposited goods *in individuo*, the depositary of a so-called irregular deposit of fungible goods only has to return a like number and quantity as those received. German law, for example, treats bank deposits as 'irregular custody agreements' (*unregelmäßige Verwahrungsverträge*) under §700 of the *German Civil Code*. Title in the goods deposited passes to the deposit-taker. When money is deposited, the transaction is treated as a 'loan agreement' (*Darlehensvertrag*) subject to §488, such that the deposit-taker is obliged to return money of an equivalent sum to the depositor. French law also treats deposits as contractual relationships between the bank and the depositor, namely a *dépôt irrégulier* governed by Article 1935 of the French Civil Code. Again, title passes to the bank, and an obligation is created to pay the depositor an equivalent sum.⁷¹ Thus, although the formal legal categories are subtly distinct to the common law, the Civilian law of bank deposits is functionally identical: making a deposit at a bank imposes a legal obligation on the bank to make payments (rather than re-deliver the specific items of property deposited) to the customer.

Central banking law adopts the same legal device, treating the contents of central bank reserve accounts as 'deposits' of account holders, which represent a financial liability on central banks' balance sheet. As we explain below, there are difficulties with that treatment in light of the other pathway for reserve

Report (Washington, DC: KPMG, 2020) 4; Bank of England, *Annual Report and Accounts 2017-2018* 32.

66 Cranston, n 4 above, 160.

67 *Bank of Marin v England* n 4 above.

68 *Citizens Bank of Maryland v Stumpf* n 4 above.

69 *Joachimson v Swiss Bank Corporation* [1921] 3 KB 110; *Foley v Hill* n 4 above. Banks enjoy a variety of legal protections not available to other debtors, including exemption from the normal obligation proactively to meet loan obligations (but to await an instruction from a customer) and the right to re-coup customer debts without recourse to litigation (the right to combination): Cranston, n 4 above, 165.

70 For an extended analysis of the irregular deposit and its similarities and differences to the loan contract, see J. Huerta de Soto (M.A. Stroup trans), *Money, Bank Credit, and Economic Cycles* (Auburn, AL: Ludwig von Mises Institute, 3rd ed, 2012) ch 1, 'The Legal Nature of the Monetary Irregular-Deposit Contract' (arguing that the two are different, but accepting that the conventional analysis treats them as equivalent).

71 See for example Cour de Cassation, Chambre Civile 1, du 7 février 1984, 82-16.655, Publié au bulletin civ. I, n° 49 at <https://www.legifrance.gouv.fr/affichJuriJudi.do?idTexte=JURITEXT000007012868>.

creation, in which central bank reserves are created by central banks, rather than commercial banks making any kind of deposit.

Reserve creation through central bank transactions

Today, most central bank reserves are created by central banks' own transactional behaviour, rather than commercial banks making deposits. The law supporting central banks' powers to create reserves has two main features: (i) express statutory powers of central banks to 'buy' and 'sell' assets or 'engage in credit transactions'; and (ii) implied statutory powers to create the monetary units necessary to carry out those transactions. Again, we explain both features by reference to US, UK, and Eurosystem law.

Legal Basis of Central Banks' Reserve-Creating Power

In each of the US, UK and Eurosystem, statutory law confers express powers to engage in two types of transaction, which carry an implied legal power to create the monetary units (central bank reserves) necessary for settlement: asset purchases and loans.

US legislation confers on the FRBs the general corporate power to make 'contracts' and specific legal authority to 'make advances to any member bank' providing collateral, thereby authorising the issue of central bank reserves via extensions of credit.⁷² The FRBs' legal power to create reserves via asset purchases is slightly more elaborate. Section 14 of the Federal Reserve Act confers power on '[e]very Federal Reserve bank ... to buy and sell, at home or abroad, bonds and notes of the United States' with the limitation that US debt securities must be purchased on the 'open market'.⁷³ Exercises of those powers must comply 'with the direction of and regulations adopted by the Federal Open Market Committee' (FOMC).⁷⁴ FOMC's regulations are codified in Chapter 12 of the Code of Federal Regulations which established the System Open Market Account (SOMA),⁷⁵ provides for the selection of a single FRB to execute 'Open Market Operations' (OMOs) and directs the selected FRB to buy and sell US government securities on the open market for the SOMA account.⁷⁶ Annually, the FRB of New York (FRBNY) is selected to execute OMOs and, under that delegated authority, it selects the counter-parties for, and executes, repo and outright transactions.⁷⁷ Through that patchwork of legal instruments, the FRBNY is empowered to engage in transactions which imply the creation of

72 Federal Reserve Act 1913, ss 4, 10B(a), 13(8). Small and Clouse, n 15 above.

73 Federal Reserve Act 1913, s 14(2)(b)(1).

74 Federal Reserve Act 1913, s 12A(b).

75 12 CFR §270.2(d).

76 12 CFR §270.4(b), (c)(1) and (3) respectively.

77 See 'Policy of Counterparties for Market Operations' 9 November 2016 at <https://www.newyorkfed.org/markets/counterparties/policy-on-counterparties-for-market-operations> which prescribes eligibility criteria as including registration as a broker-dealer in government securities or a federally chartered bank, both of which must 'demonstrate a substantial presence as a market maker that provides two-way liquidity in U.S. government securities' at

central bank reserves as the purchase proceeds for the transactions that constitute monetary policy operations.

A combination of inter-jurisdictional legislation confers power on the Eurosystem NCBs to engage in loan and asset-purchase transactions which imply the creation of reserves. At the level of European law, Article 18 of the ECB Statute empowers the ECB and NCBs to ‘operate in the financial markets by buying and selling outright ... or under repurchase agreement’ and to ‘conduct credit operations with credit institutions and other market participants, with lending being based on adequate collateral’. Because most central banking operations are legally carried out by the NCBs, rather than the ECB, European legislation provides the general framework for the creation of Euro-denominated reserves and much important detail is contained in domestic EU-member state legislation.

The constitutive statutes of many NCBs resemble section 14 of the Federal Reserve Act by conferring power to purchase and sell assets. For example, section 19 of the Bundesbank Act re-states Article 18 of the ECB Statute, conferring power on the Bundesbank to ‘grant loans backed by collateral and trade in the open market by buying and selling claims, marketable securities and precious metals outright (spot or forward) or under repurchase agreements’. Similarly, section 8 of the statute governing the Netherlands NCB, the Bank Act 1998, confers power to ‘effect transactions in the financial markets, including receiving current account deposits from account holders, accepting securities and other valuable items for safe custody, and effecting credit transactions insofar as these are covered by adequate collateral.’ Other NCBs rely directly on the authority conferred by supra-national European law to buy assets.⁷⁸

Befitting an old central bank, the Bank of England’s legal powers to transact are located in very dusty legislation. Basic legal authority to make loans and purchase assets is contained in its constitutive Royal Charter from 1694, which authorises the Bank to ‘purchase and acquire ... sell, grant, demise, alien and dispose of ...’ bills of exchange.⁷⁹ The Bank of England Act 1694 imposes a general prohibition on the Bank of England from dealing and trading; however, section 27 provides that nothing in the Act shall be construed to limit the corporation’s legal powers to ‘[deal in] bills of exchange, or in buying or selling Bullion, gold or silver or in selling any Goods, Wares or Merchandize whatsoever, which shall really and bona fide by left or deposited with the said Corporation for Money lent and advanced thereon.’ Although one has to peer very closely at them, those ancient legal texts confer authority on the Bank of England to engage in the transactions which create central bank reserves, but

<https://www.newyorkfed.org/markets/primarydealers.html#primary-dealers> (last visited 13 August 2019).

⁷⁸ Prominent examples are the Banque de France and Banca d’Italia which rely on European (rather than French or Italian) law to authorise their operations: see for example *Statuto della Banca d’Italia*, Art 34.

⁷⁹ The full text in force at June 2020 can be found at <https://www.bankofengland.co.uk/-/media/boe/files/about/legislation/1998-act>.

they leave most of the important details of those transactions to contractual bargaining between the Bank and the financial sector.⁸⁰

In conclusion, these US, European and UK legislative rules provide the basic legal authority for central banks to execute transactions which lead to the crediting of reserve accounts. In this manner, a basic implied legal authority to 'create' reserves is conferred on central banks. In the US and Eurozone, the funds supporting the asset purchases of QE were impliedly authorised by the FRBs, ECB and NCBs directly exercising those legislative authorities. The legal structure of QE in the UK was subtly different: the Bank of England exercised its legal power to create reserves by way of a 'loan' to a separate legal entity established as an ordinary trading corporation (the Bank of England Asset Purchase Facility Fund Limited), and that 'QE subsidiary' performed the asset purchases of the UK's QE program using the reserves created by its central bank parent.⁸¹

Final settlement of debts using reserve balances

The final legal institution supporting the creation of central bank money (by whichever pathway) is a set of fairly obscure statutory and contractual rules concerning finality of payments in central bank reserve accounts. This set of rules transforms the credit balances created by the exercise of legal powers into assets held by commercial banks which can be used in final settlement of their inter-bank obligations.

Settlement finality is protected by two types of legal rules. The first type protects inter-bank finality by preventing banks which participate in central bank settlement facilities from contesting the legal validity of transactions within those facilities. The second type protects transactions in central bank settlement systems from third-party challenge by disapplying otherwise generally applicable legal rules which permit economic transactions to be unwound upon insolvency. Together, those legal rules operate to ensure that a commercial bank's use of the credit balances in its reserve account provides a complete discharge from payment obligations.

Although the granular rules of each jurisdiction vary, the basic legal regime comprises a set of legislation (primary and/or delegated) and contractual law. Under US law, a combination of legislation (primary and delegated)⁸² and standard form contracts issued by FRBs,⁸³ protects payments made by US

80 Bank of England, *The Bank of England's Sterling Monetary Framework: Updated June 2015* (2015), 6.

81 A fuller analysis of the legal structure of QE in the UK is contained in Bateman, *Public Finance* n 52 above; Bateman, 'Law of Monetary Finance' n 52 above.

82 Federal Reserve Act, s 13 (empowering each FRB to accept deposits), Regulation J: 'Collection of Checks and other Items by Federal Reserve Banks and Funds Transfers Through Fedwire' §210.26(e); §210.26(i), incorporating the definition from the US Uniform Commercial Code, § 4A-103 via §210.25 (incorporating Uniform Commercial Code, Art 4A and prescribing that payment is final when a FRB receives a payment order by a Master Account holder and credits another Master Account).

83 Operating Circular No 6 'Funds Transfer Through the Fedwire Funds Service' (20 December 2019), is issued by each FRB pursuant to the authority in Regulation J §210.25 to govern 'the details of its funds-transfer operations'.

reserve account holders via the Federal Reserve's payments system, 'Fedwire', from inter-bank and third-party challenge.⁸⁴ The overall result is that, once a credit balance in a reserve account of a Federal Reserve member bank has been transferred to another bank's reserve account, the debt between the two commercial banks is finally extinguished.

In the Eurosystem, supranational law governs both inter-bank and third-party finality via the Settlement Finality Directive of 1998, which provides that a transfer order sent through a central bank settlement system: (i) 'may not be revoked by a participant in a system, nor by a third party, from the moment defined by the rules of that system'; (ii) and 'shall be legally enforceable and, even in the event of insolvency proceedings against a participant, shall be binding on third parties'.⁸⁵

The same result is achieved in the UK though a combination of delegated legislation and contract. Inter-bank finality is achieved by a contractual agreement between the Bank of England and each reserve account holder that 'any payment instruction, payment or transfer to or from any Account may not be revoked by the Account Holder after the Bank [of England] has credited the Account'.⁸⁶ Third-party finality is achieved by delegated legislation (made by the UK's Treasury) which explicitly disapplies insolvency legislation which permits the voiding of payment transactions executed on the day of a bank's insolvency.⁸⁷ so-called 'zero-hour' rules.⁸⁸

The legal frameworks governing the finality of payments in central bank settlement facilities sketched above throw up a number of interesting issues, including their possible characterisation as a form of 'legal tender' law for central bank reserves. The important point for now is that in each jurisdiction, legislative and contractual rules provide the foundation for using credit balances in central bank accounts in the final settlement of inter-bank liabilities. In that way, law provides the basis for the use of central bank reserves as the apex settlement asset of the financial system.

Complexities of the law of central bank reserve creation

The law governing the creation of central bank reserves has an elusive quality because each of the three elements (deposit, transaction, and finality) co-exist as

84 Third-party challenge is protected by the absence of a statutory zero-hour rule applying to Federally-chartered banks, see the Federal Reserve Systems response to the Bank of International Settlements' Committee on Payment and Settlement Systems, Core Principles for Systemically Important Payment Systems: 'The Fedwire Funds Service: Assessment of Compliance with the Core Principles for Systemically Important Payment Systems' July 2014, 13 at https://www.federalreserve.gov/paymentsystems/fedfunds_coreprinciples.htm#core110.

85 Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems, Art 5. The Directive has been transposed into the national law of Member States through bespoke legislation: See Commission of the European Communities Directorate General for Internal Market – Budget, *Final Report: Study Into the Transposition by Member States of Directive 98/26/EC* (19 February 2003).

86 RTGS Account Mandate Terms and Conditions, cl 7.1.

87 The Financial Markets and Insolvency (Settlement Finality) Regulations 1999, Part III.

88 See generally P. Paech, 'Close-Out Netting, Insolvency Law and Conflict-of-Laws' (2014) 14 *Journal of Corporate Law Studies* 419.

a matter of the internal practice of central banks. Take the Federal Reserve's system of 'Master Accounts' which serves the multiple purposes of clearing funds, meeting reserve requirements, receiving advances and clearing the proceeds of securities transactions.⁸⁹ Under that system of accounts, a FRB may indebted itself to a commercial bank by accepting deposits into the Master Account (under the general law of contract); it may create a debt in the commercial bank by crediting a commercial bank's Master Account (exercising statutory power to extend credit); and it may simply transfer reserves into a Master Account (exercising statutory power to purchase assets). In each of those three cases, the same monetary unit (a central bank reserve) passes through the same account, despite the clear juridical differences between each transaction.⁹⁰ The co-existence of the various elements of reserve creation reflects the path dependency of 20th century monetary law, rather than conscious choices on the part of either central bankers or legislatures, but that co-existence can create confusion (outside the financial *cognoscenti*) about the basic legal and financial nature of central bank reserves, particularly in relation to the status of reserves as 'deposits' and 'liabilities' of the central bank.

Path Dependence of Monetary Law

Under a convertible-metallic monetary system, there could be little confusion in identifying the contents of reserve accounts as a deposit liability owed by the central bank to the commercial bank account holder. Juridically, gold standards were created by legislative rules which fixed the value of monetary units to a given quantity of a metallic commodity, required or permitted the 'payment' of bank notes by delivering that commodity and required central banks (as custodians of the gold stock) to maintain a certain ratio of gold to their liabilities.⁹¹ Accordingly, under a metallic-convertible monetary system, the content of reserve accounts was obviously a monetary unit representing a deposit *qua* an obligation to pay or purchase gold. At the inception of the Federal Reserve System, member banks of the Federal Reserve System met their reserve requirements by the physical deposits of gold, gold certificates or 'lawful money'

89 See for example the use of Master Accounts in the Federal Reserve System as the accounting vehicle to record reserve requirements (deposits of commercial banks) and advances (loans of the central bank): Federal Reserve Bank, 'Operating Circular No 10: Lending' (effective 16 July 2013).

90 The same can be said of the Bank of England's system of 'settlement' and 'reserves' accounts (Bank of England, RTGS Account Mandate Terms and Conditions, cl 2) and the payments module of the Eurosystem's TARGET2 real-time gross settlements system.

91 For example Gold Reserve Act 1934 (US), s 2, amending the Federal Reserve Act 1913 (US), s 16: 'Every Federal Reserve bank shall maintain reserves in gold certificates or lawful money of not less than 35 per centum against its deposits and reserves in gold certificates of not less than 40 per centum against its Federal Reserve notes in actual circulation'; see generally M. Bordo and A. Redish, 'Putting the "System" in the International Monetary System' in D. Fox and W. Ernst, *Money in the Western Legal Tradition: Middle Ages to Bretton Woods* (Oxford: OUP, 2016) ch 27.

(physical notes issued by the US Treasury and Federal Reserve Notes)⁹² with their Federal Reserve Bank.⁹³ As the US monetary system morphed, between 1913 and 1972, from a convertible, to a non-convertible but gold-backed, to a full-fiat money system,⁹⁴ reserve requirements could be met by maintaining credit balances in the member bank's Master Account at the Federal Reserve.⁹⁵ In a monetary system without convertibility rules, however, treating the contents of reserve accounts as 'deposits' is less straightforward. When central banks are relieved of any legal obligations to exchange notes for, or maintain stock of, metal (or foreign currency), a reserve account simply becomes an index of the transactions executed by commercial banks with central banks.

Throughout the changes of the past century, however, the idea of a 'deposit' as an element of central bank reserve creation has remained remarkably durable. Its contemporary relevance can be seen in the continuation of financial reporting conventions that treat credit balances in reserve accounts as deposit liabilities. The Federal Reserve, ECB and Bank of England all record the contents of commercial banks' reserve accounts as deposit 'liabilities' in their consolidated balance sheets: they are treated as 'other deposits held by depository institutions' in the Federal Reserve's consolidated balance sheet;⁹⁶ 'deposits' in the Bank of England's combined balance sheet;⁹⁷ and 'current accounts' and 'deposit facility' in the ECB's consolidated balance sheet.⁹⁸ That balance sheet treatment is predicated on the assumption that central bank reserves are created by commercial bank deposits and represent a debt owed by the central bank to the depositing commercial bank. That is so despite the facts that: (i) a credit balance in a reserve account does not entitle the commercial bank account holder to 'payment by the central bank' in any meaningful sense; (ii) the overwhelming majority of central bank reserves are created by central banks crediting reserve accounts, rather than commercial banks transferring deposits into reserve accounts; and (iii) that, at least since March 2020, many central banks have reduced reserve requirements to zero per cent.⁹⁹

In the context of commercial banking, a 'deposit' functions as money because it is treated as a transferrable claim for payment against the bank at which

92 Pre-1914 US currency was something of a menagerie, including civil-War era 'greenbacks', silver coins, silver certificates and 'national bank notes' (issued by commercial banks, but backed by US government securities): E.C. Simmons, 'The Concept of Lawful Money' (1938) 46 *Journal of Political Economy* 108, 115; Friedman and Schwartz, n 32 above, 20-49.

93 See Board of Governors of the Federal Reserve System, 'Operating Circular No 10 of 1914' and *First Annual Report of the Federal Reserve Board* 1914, 167; Friedman and Schwartz, *ibid*, 194.

94 For the interaction of monetary law and central bank operations over that period, see K. Dam, 'From the *Gold Clause Cases* to the Gold Commission: A Half Century of American Monetary Law' (1983) 50 *University of Chicago Law Review* 504.

95 See now Federal Reserve Banks Operating Circular 1, 'Account Relationships' (effective 1 February 2013).

96 Board of Governors of the Federal Reserve System, 'Quarterly Report on Federal Reserve Balance Sheet Developments May 2019', 4.

97 Bank of England, *Annual Report and Accounts 2017-2018* 32.

98 European Central Bank, 'Consolidated balance sheet of the Eurosystem as at 31 December 2018', C2.

99 For example Board of Governors of the Federal Reserve System, 'Federal Reserve Actions to Support the Flow of Credit to Households and Businesses' Press Release, 15 March 2020 at <https://www.federalreserve.gov/monetarypolicy/reservereq.htm>.

the account is held.¹⁰⁰ It is strongly contestable whether that notion of a deposit translates into the context of central bank reserve accounts. Economists, accountants and jurists have all noted the difficulties of characterising monetary units created by a central bank under ‘fiat’ regimes as ‘claims’ on, or ‘liabilities’ of, the central bank.¹⁰¹ Rather than answer that deep question here,¹⁰² it suffices to note that the continued practice of accounting for those purchases as ‘deposits’ demonstrates the intellectual durability of the ‘deposit pathway’ of thinking about the creation of central bank reserves.

The payment of interest on excess reserves (IOER) also reflects this path dependency. Since the commencement of QE, the accumulated central bank reserves created to purchase assets have been labelled ‘excess’ reserves,¹⁰³ and central banks announced they would pay ‘interest’ on those excess reserves as an additional monetary policy transmission mechanism.¹⁰⁴ Of course, the idea that IOER represents interest on debt obligations owed by central banks to commercial banks account holders is highly artificial. The financial reality of IOER is that central banks are simply paying additional sums to financial market participants in volumes which are referable to the quantity of reserves issued via QE programs. Despite that financial reality, the description of the payment of ‘interest’ on those reserves indicates that central banks continue to rely on the idea of a loan agreement between a commercial bank (creditor) and central bank (debtor) in their characterisation of a reserve account.

Pathways to Exercise Monetary Authority

Our detailed analysis above exposed the somewhat obscure law behind the creation of central bank reserves. Consideration of this law shows that the creation of central bank reserves is legally authorised in different ways, none of which exactly reflects conventional understandings. Reserves are created by

100 See the enlightening discussion of ‘deposit’ creation in A. Young, ‘The Mystery of Money’ in P.G. Mehrling and R.J. Sandilands (eds), *Money and Growth: Select Papers of Allyn Abbott Young* (London: Routledge, 1999) 273.

101 See Proctor, n 6 above, 25; E. McKendrick, *Goode on Commercial Law* (London: LexisNexis, 4th ed, 2009), 487; Gleeson, n 6 above, 4.4.6; W. Buiters, ‘Helicopter Money: Irredeemable Fiat Money and the Liquidity Trap’ NBER Working Papers, No 10163 (2003), and K. Olivecrona, *The Problem of the Monetary Unit* (New York, NY: Macmillan, 1957) 63; D. Archer and P. Moser-Boehm, ‘Central Bank Finances’ BIS Papers No 71 (April 2013); B. Bossone, M. Costa, A. Cuccia and G. Valenza, ‘Accounting meets economics: towards an “accounting view” of money’ DSEAS Working Papers No. 18-05 at <https://doi.org/10.2139/ssrn.3270860>.

102 For a paper devoted exclusively to arguing that central bank reserves are not ‘liabilities’, ‘shareholder equity’ or ‘assets’ of central banks in fiat money systems, see: M. Kumhoff, J. Allen, W. Bateman, S. Gleeson, R.M. Lastra and S.T. Omarova, ‘Central Bank Money: Liability, Asset or Equity of the Nation?’ Cornell Legal Studies Research Paper 20-46 at <https://ssrn.com/abstract=3730608>.

103 T. Keister and J. McAndrews, ‘Why Are Banks Holding So Many Excess Reserves?’ (2009) 15 *Federal Reserve Bank of New York: Current Issues* 1.

104 D. Bowman, E. Gagnon, and M. Leahy, ‘Interest on Excess Reserves as a Monetary Policy Instrument: The Experience of Foreign Central Banks’ Board of Governors of the Federal Reserve System: International Finance Discussion Papers No 996 (March 2010); C. Borio and P. Disyatat, ‘Unconventional Monetary Policies: An Appraisal’ BIS Working Paper No 292 (November 2009) 6, 12.

commercial banks in dealings that follow a ‘deposit pathway’ and by central banks in dealings that follow a ‘transaction pathway’. These rest on powers implied from the ability to take deposits and engage in transactions, respectively. Both legal bases for reserve creation co-exist in modern central banking law. However, since the advent of QE (and probably earlier), the only pathway that really matters is the transaction pathway. This means that the dominant type of legal authority is the implied legislative power of central banks to create reserves through transactions with counterparties. This analysis holds implications for the contemporary exercise of monetary authority in the systems under study, and it is to these implications that we now turn.

RESERVE CREATION AND MONETARY AUTHORITY

This concluding part evaluates the impact of our legal analysis of central bank reserves on key issues concerning ‘monetary authority’, being the authority of the constitutional state over money. We argue that the legal structure of reserve creation reflects a type of ‘intermediated monetary authority’ wherein the state’s authority over money is legally contingent on the existence of a particular set of financial market attributes: willing counterparties, marketable assets, and a particular type of payments system. We then explain the impact of that argument on two presently prominent topics in monetary law and practice: the scope of central bank ‘mandates’ and the conception of central banks as ‘magic money trees’. We close the article by mooting the potential impacts of ‘central bank digital currencies’ on our model of intermediated monetary authority.

Intermediated monetary authority

The most important consequence of our analysis of central bank reserve creation is to observe how the law which empowers central banks to issue the apex monetary asset of the modern economy assumes the existence of financial intermediaries between the central bank and the non-financial economy.¹⁰⁵ In one sense, this observation is suggested by the conventional description of central bank account balances as ‘reserves’, ie monetary units being held *in reserve* of commercial bank liabilities. More important than this vestigial terminology, however, is the fact that the intermediated nature of reserve creation flows directly from the legal instruments that confer authority on central banks. Those statutes only confer authority to create reserves by implication from express grants of power to engage in financial market transactions: collateralised extensions of credit; and purchases of securities. In granting the power to create reserves in those terms, the relevant legal instruments assume a number of stable features of financial markets.

¹⁰⁵ In developing this constitutional argument, we owe a great debt to the work of Hockett and Omarova, who clearly articulated the dynamic interdependence of public and private monetary entities in their paradigm-shifting work on ‘The Finance Franchise’, n 12 above.

First, central bank statutes assume the existence of a *financial market participant* as the counterparty to an asset purchase or the recipient of credit. Most of the time, those counterparties will be commercial banks holding reserve accounts, but not always. The most prominent examples of non-commercial bank counterparties are the investment banks within the group of ‘primary dealers’ which transact with the FRBNY, and the ‘gilt-edged market-makers’ who transact with the Bank of England (and its QE subsidiary),¹⁰⁶ through the implementation of monetary policy operations.¹⁰⁷ Although the distinction between commercial banks (with broad deposit-taking and retail lending businesses) and investment banks (without a large deposit footprint and a focus on complex financial transactions and advising businesses) is often blurred,¹⁰⁸ a number of central bank counterparties run pure investment businesses as specialist dealers in government securities.¹⁰⁹ Irrespective of their precise categorisation, those banks sit as intermediaries between central banks and the economic actors in the real economy that are the ultimate targets of monetary policy operations: households, consumers and non-financial firms.

Secondly, statutory grants of power to create reserves assume the existence of a *marketable asset*, in most cases a financial asset such as a debt security. Because of the implied nature of that power, the central bank needs something to buy, sell, or pledge in order to create reserves. The contemporary preference is for essentially risk-free assets (mostly government bonds) that are functionally immune to market and asset-specific risk and therefore can be assumed to trade at par.¹¹⁰ Thirdly, grants of legal power to create reserves assume a particular *type of payments system* in which the vast majority of payments occur via deposit accounts held with banks who seek clearance and credit facilities through their central bank. In other words: central bank reserves only obtain their monetary status as a result of the use, by commercial banks, of central bank accounts as the chief clearing house in the payment system. The status of central banks as

106 See n 81 above and accompanying text.

107 Some central banks publish lists of their preferred counterparties for monetary policy operations, notably the FRBNY for the Federal Reserve System (<https://www.newyorkfed.org/markets/primarydealers>) and the Bank of England (<https://www.bankofengland.co.uk/markets/bank-of-england-market-operations-guide/our-tools> and <https://www.dmo.gov.uk/responsibilities/gilt-market/market-participants/>).

108 Many large commercial banks exist within corporate groups which include investment banking subsidiaries, including the following contemporary examples of FRBNY and Bank of England counterparties (drawn from the lists at n 107 above): Barclays Capital Inc; Citigroup Global Markets Inc; HSBC Securities (USA) Inc; and Lloyds Bank Corporate Markets plc; and NatWest Markets plc (in the UK).

109 Pure investment banks that are central bank monetary policy counterparties in 2020–21 (also drawn from the lists at n 107 above) include: Amherst Pierpont Securities LLC; Cantor Fitzgerald & Co; Daiwa Capital Markets America Inc; Jeffries LLC; and Nomura Securities International Inc (as FRBNY counterparties); and Winterflood Securities Limited (as a Bank of England counterparty).

110 This preference is strongly expressed in QE operations: in credit operations (repo and collateralised credit lines) a broader set of financial assets are accepted by central banks in exchange for reserves, particularly in the Eurosystem: see K. Tamura and E. Tabakis, ‘The Use of Credit Claims as Collateral for Eurosystem Credit Operations’ ECB Occasional Paper Series, No 148 (June 2013); U. Bindseil, M. Corsi, B. Sahel and A. Visser, ‘The Eurosystem Collateral Framework Explained’ ECB Occasional Paper Series, No 189 (May 2017) and the data at ‘Eurosystem Collateral Data’ at <https://www.ecb.europa.eu/paym/coll/charts/html/index.en.html>.

the ultimate settlement institutions, however, is not guaranteed – for example, apex settlement facilities in the Hong Kong SAR are shared between the Hong Kong Monetary Authority and three commercial banks.¹¹¹

Finally, and most importantly, grants of legal power to create reserves assume that the relevant financial market transactions will be *voluntary*. Although central banks are public agencies, the legal powers granted to them are powers to engage in consensual transactions with other economic actors. This allows us to contrast unconventional policy measures such as QE with alternatives such as direct fiscal stimulus. Direct fiscal stimulus can be delivered to any economic actor (including individuals and ordinary firms), does not require a collateral asset, such as government bonds, does not presuppose or require any particular payments system, and can be involuntary.¹¹²

These preconditions combine such that the money-creating powers of central banks are contingent on the intermediation of the financial sector. Central banks' legal authority to create money is conditioned on demand for that money in the economy, and the nature of the demand will influence the nature of the money that is created. Put differently, reserve creation can take various forms depending on the type of transaction and assets involved (for example repo versus outright purchase, public versus private sector assets, and longer versus shorter maturity) and depending on the frictions existing in the relevant financial market.¹¹³

The impact of financial market actors on the exercise of monetary authority under the current legal frameworks of central bank reserve creation is vividly illustrated at times of crisis. Before the financial crisis, conventional exercises of monetary authority assumed a particular type of financial market profile and the abrupt shift in that market brought an equally abrupt shift in the exercise of monetary authority by central banks.¹¹⁴ Interest rate setting operations assumed that repo counterparties were willing to accept duration-limited reserve balances (ie loans of reserves). As their balance sheets were punctured by failing assets, those counterparties became less willing to execute repos and central banks were forced to change the exercise of their monetary powers to replace time-limited (repo) with permanent (outright purchases) balances under QE. Although different lessons may be learned by economists, the difficulty of executing monetary policy at the zero-lower bound teaches jurists that monetary authority is heavily contingent on the behaviour of financial market actors.

The same lesson was reinforced during the Covid-19 pandemic. The Federal Reserve's first response to the pandemic was not to expand QE, but to expand its credit provision via repo,¹¹⁵ thereby exercising monetary authority by

111 Which provide RTGS settlement in three foreign currencies: HSBC (US Dollar settlement), Barclays (Euro settlement) and Bank of China (Hong Kong) (Renminbi settlement).

112 As it was in Australia where a citizen sued the national government to prevent it from depositing AUD200 into his bank account through a direct fiscal stimulus program in 2009; see *Pape v Federal Commissioner of Taxation* (2009) 238 CLR 1.

113 See A. Haldane, M. Roberts-Sklar, T. Wieladek and C. Young, 'QE: the story so far' Bank of England Staff Working Paper No 624 (October 2016) 7–8.

114 As we explained above in the section headed 'Systemic functions of central bank reserves'.

115 Federal Reserve Bank of New York, 'Operating Policy: Statement Regarding Repurchase Operations' Policy Document, 11 March 2020 at <https://www.newyorkfed.org/markets/opolicy/>

providing time-limited credit to the financial system via the financial firms which are the FRBNY's designated open-market operation counterparties: the Primary Dealers. The Federal Reserve only shifted to outright purchases when the Primary Dealers refused to assume the re-payment burden of repos:¹¹⁶ thereby exercising monetary authority by providing permanent increases in the financial system's reserve balances.

As the Federal Reserve's Chair explained:

liquidity had become very strained in Treasury ... markets, and we decided to offer very large quantities of term and overnight repo to address that. That makes it easier to finance the purchase of ... Treasuries. So we did that, and ... the take-up was not as high as many had expected, and ... we did learn something from that. ... [W]hat we learned was that we needed to go direct here rather than trying to intermediate through the dealers.

And so we realized at that point that we would need to actually purchase securities for our portfolio, so we did that on Friday. We bought – the next day, Friday, we went in and we bought across the curve, and we bought, I think, \$37 billion worth of securities ...¹¹⁷

Those remarks emphasise the reality of intermediated monetary authority: central banks' institutional authority to create money is confined to consensual financial market transactions and heavily influenced by the decisions of private market counterparties.

Future scholarly effort will be required to explore the full ramifications of our conclusion that existing legal frameworks create an intermediated form of monetary authority. Interesting issues will surely arise in applying our model of intermediated monetary authority once one takes account of the existence of 'shadow banks' (credit issuing institutions without reserve accounts or deposit insurance)¹¹⁸ and the reality of the US Dollar as the *de facto* global reserve currency.¹¹⁹ In both contexts, the role played by domestic legal institutions in funnelling monetary authority through the financial system is complicated by the role of hegemonic states and non-traditional financial actors. A further complex of issues is likely to arise in determining the different ways that

operating_policy_200311; Federal Reserve Bank of New York, 'Operating Policy: Statement Regarding Treasury Reserve Management Purchases and Repurchase Operations' Policy Document, 12 March 2020 at https://www.newyorkfed.org/markets/opolicy/operating_policy_200312a.

116 Federal Reserve Bank of New York, 'Operating Policy: Statement Regarding Treasury Securities, Agency Mortgage-Backed Securities, and Repurchase Agreement Operations' 11 March 2020 at https://www.newyorkfed.org/markets/opolicy/operating_policy_200315.

117 Board of Governors of the Federal Reserve System, Transcript of Chair Powell's Press Conference Call, 15 March 2020, 20 at <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20200315.pdf>.

118 See T. Adrian, A. Ashcraft, H. Boesky, and A. Pozsar, 'Shadow Banking' Staff Reports no 458, Federal Reserve Bank of New York (July 2010).

119 S. Murau, 'Shadow Money and the Public Money Supply: the Impact of the 2007–2009 Financial Crisis on the Monetary System' (2017) 24 *Review of International Political Economy* 802; S. Murau, J. Rini and A. Haas, 'The Evolution of the Offshore US-Dollar System: Past, Present and Four Possible Futures' (2020) *Journal of Institutional Economics* 1.

intermediated monetary authority is exercised during economic and financial crises: where legal, political and economic conditions may operate to deprive money of most of its legitimate ‘authority’.¹²⁰ Finally, a discrete set of legal, financial and constitutional issues arise in relation to the use of central banks’ money creation powers to fund public expenditure (aka, ‘monetary financing’), where monetary authority is ‘intermediated’ through national treasuries, rather than commercial banks.¹²¹

Rather than pre-empt answers to those broader questions, we close our analysis by illustrating the concrete impact of our concept of intermediated monetary authority on three prominent topics in central banking and economic policy: the relationship between central banks’ legal powers and their ‘mandates’; the descriptive accuracy of the idea that central banks are ‘magic money trees’; and the potential impacts of ‘central bank digital currencies’ on the monetary authority of the constitutional state.

Central bank mandates and ‘the magic money tree’

Most economic and policy debates on the scope of central banks’ monetary authority focus intensely on the rigidity/flexibility and appropriateness of ‘mandates’. Central bankers, politicians, practicing economists, and academics use the concept of a mandate as a proxy for the ‘core institutional objectives’ of central banks: the ultimate tasks they must perform. The usage fits the private financial market origins of central banking wherein the concept of a mandate has a rich history, representing the legal constraint on the scope of authority held by a banker (or investment professional) in the management of a client’s funds.¹²²

Despite the clarity of the concept in financial practice, the precise relationship between a central bank’s ‘mandate’ and its governing legal framework is not always clear. Some central bank statutes explicitly provide a set of overarching objectives which match the bank’s own understanding of its ‘mandate’. An example is the US Federal Reserve System’s legislative ‘monetary policy objectives’:

The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy’s long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.¹²³

Other central bank mandates are less decisive. For example, the Bank of England’s monetary policy mandate mixes price stability with a nebulous command

120 J. van ‘t Klooster, ‘Democracy and the European Central Bank’s Emergency Powers’ (2018) 42 *Midwest Studies in Philosophy* 270; Bateman, *Public Finance*, n 52 above, chs 7 and 9.

121 See generally Bateman, *ibid*, chs 1, 5 and 7.

122 See for example Cranston, n 4 above, 140 for a discussion of the various meanings of mandate in English law.

123 Federal Reserve Act 1913, s 2A.

to ‘support the economic policy of Her Majesty’s Government, including its objectives for growth and employment’.¹²⁴

From one perspective, *mandates limit the way central banks can lawfully exercise their powers*. For example, the power to create central bank reserves is cabined by the central bank’s price stability objectives. In other words, the ‘mandate’ of the central bank determines the purposes for which the central bank can use its legal powers.¹²⁵ In itself, this is relatively obvious and not particularly interesting.

A more interesting inquiry is whether central bank *mandates are limited by central banks’ legal powers*: does a mandate to pursue, for example, price stability merely impose a duty on the central bank to use its powers to pursue that objective, or do the central bank’s powers grow to fill its mandate. In our view, it is clear that the limits of an entity’s legal powers will restrict the ways in which it can pursue its institutional objectives. The police, for example, are given a broad ‘mandate’ to investigate crimes, that broad objective is limited by the legal capacities conferred on individual police personnel which are expressly granted and strictly circumscribed. The same reasoning applies to central banks. As agencies wielding public authority, central banks are duty-bound to pursue broad public policy objectives, but the practical means at their disposal are limited to those expressed or implied in the relevant legal framework. The mandate may inform the interpretation of empowering legislation, but the imposition of (say) a duty to pursue an inflation target does not per se entail an extension of the central bank’s legal power and capacities.

On our analysis, the central banks we have studied can, at present, only execute their mandated objectives (for example price/financial stability, full employment, and economic growth) through financial market transactions that involve commercial banks (and other private entities) as willing counterparties. It is only through such transactions that central banks are able to create reserves, the core monetary unit of the modern economy. So, again, the authority of central banks to pursue their ‘mandates’ is intermediated, in a crucial, but under-appreciated, sense through financial markets. That view of the legal limits of central bank mandates carries weighty implications for prominent policy questions concerning central banks’ response to financial crises. For example, proposals of ‘QE for the people’¹²⁶ or ‘helicopter money’ (ie direct monetary stimulus to individuals)¹²⁷ might hit against legal constraints – or, more accurately, falter due to an absence of a legal power on the part of the central bank.

124 Bank of England Act 1998 (UK), s 11.

125 That approach to the relationship between mandates and central bank power underpinned the case law of the Court of Justice of the European Union concerning the legality of QE under European law: C-62/14 *Gauweiler v Deutscher Bundestag* ECLI:EU:C:2015:400; C-493/17 *Weiss and Others* ECLI:EU:C:2018:1000.

126 See for example Positive Money, ‘QE for the People’ at <https://positivemoney.org/what-we-do/qa-for-people/>.

127 J. Galí, ‘The Effects of a Money-Financed Fiscal Stimulus’ The National Bureau of Economic Research Working Paper No 26249 (September 2019); W. Buiter ‘The Simple Analytics of Helicopter Money: Why It Works – Always’ (2014) 8 *Economics: The Open-Access, Open-Assessment E-Journal* 1.

Ultimately, the intermediated nature of monetary authority has broader implications on academic and political understandings of the nature of central banks' powers. A persistent idea is that central banks exercise the power of governments to 'create money', that such powers are unlimited, with the consequence that states (via central banks) have unlimited monetary resources. The dominant academic/institutional sentiment regarding central bank's powers of money creation is captured by the following:

A central bank is the monopoly supplier of base money in its jurisdiction and can create such money at will, instantaneously, and at virtually no cost. And its customers are required to accept it. Accordingly, a central bank does not face the liquidity constraint faced by commercial banks and other entities, including the government.¹²⁸

In popular discourses, the same notion is more pithily expressed: central banks are 'magic money trees'¹²⁹ that 'print money'¹³⁰ at will.

Monetary authority appears less infinitely extensible from the perspective of the existing legal structure of central banks. Unless fundamentally re-modelled, central banks are legally built to exercise monetary authority via the private credit system, and their chief functions of providing liquidity insurance and settlement facilities assume that the vast majority of real economic transactions are funded by (or paid via accounts held at) commercial banks. Under the current institutional conditions, proposals to utilise central bank powers to execute monetary policy directly with the non-bank public are fraught with legal risk.

Dis-intermediation of monetary authority via 'central bank digital currencies'

Our depiction of intermediated monetary authority is built on the law governing the *current* monetary system. It likely, however, that the monetary status quo will soon undergo a significant change through the introduction of 'central bank digital currencies' (CBDC), electronic monetary units issued by central banks to non-financial firms and the general population, thus distinct from both extant forms of central bank money (ie, cash and reserves). We conclude by discussing the potential implications of CBDC on our model of intermediated monetary authority.

Rapid developments in information technology and social acceptance of electronic transactions appear to make CBDC an inevitability.¹³¹ In 2019,

128 D. Archer and P. Moser-Boehm, 'Central bank finances' BIS Papers No 71 (April 2013) 8.

129 F. Boat, 'The Truth Behind the Magic Money Tree' Positive Money at <https://positivemoney.org/2017/06/magic-money-tree/>.

130 See for example Editorial Board, 'Printing money is valid response to coronavirus crisis: Quantitative easing programmes may be here for the long term' *Financial Times* 6 April 2020 at <https://www.ft.com/content/fd1d35c4-7804-11ea-9840-1b8019d9a987>.

131 An additional driver was the popularisation, post-2008 of , euphioniously branded, 'cryptocurrencies' and the prominent first-mover, 'Bitcoin': for a canonical text in that eclectic tradition,

following several years of academic study,¹³² CBDC became a topic of intense institutional focus after a proposal by a large US information technology company to create its own digital currency that would compete with national currencies.¹³³ By the end of 2020, all major central banks inside (and outside)¹³⁴ the OECD indicated that they were exploring or would adopt some form of CBDC,¹³⁵ and the International Monetary Fund released a detailed analysis of the legal changes necessary to adopt CBDC in advanced and emerging economies.¹³⁶ At early 2021, the precise legal and financial forms of CBDC remain topics of investigation and debate, and proposals differ along a number of axes. Several design characteristics of particular importance are whether the proposed CBDC: (i) is wholesale or retail; (ii) follows an ‘account-based’ or ‘token-based’ model; (iii) forms a direct (one-tier) or indirect (two-tier) system between the central bank and the user; (iv) is centralised or de-centralised; and (v) could be ‘programmable’ and ‘interoperable’.¹³⁷

Given the strong momentum behind its adoption, special caution should attend an evaluation of CBDC’s total impact on the monetary system, central banks and the constitutional societies they serve. There is no ‘particular innovation in the provision of electronic access to money, as debit and credit cards, internet banking and their union in online shopping have all been available for some time’.¹³⁸ Nor is there any novelty in the use of electronic money in central

see, S. Nakamoto, ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ Working Paper 2008 at <http://bitcoin.org/bitcoin.pdf>.

- 132 See for example J. Barrdear and M. Kumhof, ‘The Macroeconomics of Central Bank Issued Digital Currencies’ Bank of England Staff Working Paper No 605 (July 2016); M. Kumhof and C. Noone, ‘Central bank digital currencies – design principles and balance sheet implications’ Bank of England Staff Working Paper No 725 (May 2018).
- 133 In 2019, Facebook Inc proposed the creation of a digital currency named ‘Libra’ which would be backed by a number of national currencies, but pegged to none. After 12 months of intense scrutiny and opposition from central banks and financial regulators, Facebook withdrew the Libra proposal and replaced it with an online payments platform named ‘Diem’: Libra Association Members, ‘White Paper v2.0’ April 2020 at <https://www.diem.com/en-us/white-paper/#cover-letter>; J.L. Maniff, ‘How Did We Get Here? From Observing Private Currencies to Exploring Central Bank Digital Currency’ Federal Reserve Bank of Kansas City, Payments System Research Briefing (February 2020).
- 134 By the end of 2020, the People’s Bank of China had begun issuing Renminbi-denominated CBDC to residents of Shenzhen on a trial basis and introduced legislation to facilitate the permanent issue of RMB-CBDC: R. Auer, G. Cornelli and J. Frost, ‘Rise of the Central Bank Digital Currencies: Drivers, Approaches and Technologies’ BIS Working Papers No 880 (August 2020) 22–24.
- 135 See the Joint Report by The Bank of Canada, European Central Bank, Bank of Japan, Sveriges Riksbank, Swiss National Bank, Bank of England, Board of Governors of the Federal Reserve and Bank for International Settlements entitled ‘Central Bank Digital Currencies: Foundational Principles and Core Features’ Report no 1 In a Series of Collaborations from a Group of Central Banks (9 October 2020). See also C. Boar and A. Wehrli, ‘Ready, steady, go? – Results of the third BIS survey on central bank digital currency’ BIS Papers No 114 (January 2021).
- 136 W. Bossu *et al*, ‘Legal Aspects of Central Bank Digital Currency: Central Bank and Monetary Law Considerations’ IMF Working Paper WP/20/254 (November 2020).
- 137 See for example Joint Report published by the BIS, n 135 above; U. Bindseil, ‘Tiered CBDC and the financial system’ ECB Working Paper No 2351 (January 2020); Bossu *et al*, *ibid*, 9. However, for a critical discussion of the ‘account’ versus ‘token’ dichotomy, see A. Milne, ‘Argument by False Analogy: The Mistaken Classification of Bitcoin as Token Money’ 25 November 2018 at <https://ssrn.com/abstract=3290325> or <https://doi.org/10.2139/ssrn.3290325>.
- 138 Barrdear and Kumhoff, n 132 above, 5.

banking, as all modern central bank payment systems operate through computer hardware and software that permit the creation, transferral and recording of credit and debits in digital form, rather than making physical entries in hardcopy account books or (literally) moving money from one reserve account to another.¹³⁹ All the central bank reserves created since, at least, the turn of the 21st century exist only as entries in computer systems. To that extent, a form of CBDC is already an entrenched feature of modern monetary systems.

CBDC does, however, hold transformative potential because it could be designed to permit non-financial firms and individuals to interact *directly* with central banks. In financial-sector parlance, that effect would be achieved by ‘retail’ CBDC,¹⁴⁰ ie, digital currency issued by a central bank to individuals and firms that transact outside the ‘wholesale’ financial system composed of central banks, commercial banks, security dealers and other large financial firms.¹⁴¹ Insofar as a retail CBDC’s design features permitted ordinary people and firms in the real economy to by-pass commercial banks (and other non-bank financial firms) in making payments and obtaining credit, some dis-intermediation of monetary authority would be a natural consequence of its adoption.

Predicting the final, concrete, impact of CBDC on the financial system is fraught with difficulty. Incrementalism has been adopted as a ‘foundational principle’ for the roll-out of CBDC by the central banks of the G7;¹⁴² ‘[c]entral banks have a mandate for stability and proceed cautiously in new territory’.¹⁴³ Central banks have also indicated that CBDC should coexist with the other monetary units of the contemporary economy: ‘[d]ifferent types of central bank money – new (CBDC) and existing (cash, reserve or settlement accounts) – should complement one another and coexist with robust private money (for example commercial bank accounts) to support public policy objectives’.¹⁴⁴ In line with those policies, actual implementation of CBDC in advanced mixed economies has been confined to very narrow pilot projects.¹⁴⁵

In light of the protean nature of current CBDC proposals, we present the potential impact of CBDC on the model of intermediated monetary authority as existing on a spectrum between: low dis-intermediation and high dis-intermediation, according to its eventual design features. At the ‘low dis-intermediation’ end of the spectrum, retail CBDC could simply expand the set

139 See Gleeson, n 6 above, 150.

140 R. Auer and R. Böhme, ‘The Technology of Retail Central Bank Digital Currency’ BIS Quarterly Review (March 2020) 85.

141 See the Joint Report published by the BIS, n 135 above, 6, fn 4.

142 Board of Governors of the Federal Reserve System, European Central Bank, Bank of Japan, Bank of England writing with the Bank of Canada, Sveriges Riksbank and the Bank of International Settlements.

143 Joint Report on Central Bank Digital Currencies, n 135 above, 10.

144 *ibid.*

145 See for example Sveriges Riskbank, ‘E-Krona pilot Phase 1’ April 2021 at <https://www.riksbank.se/globalassets/media/rapporter/e-krona/2021/e-krona-pilot-phase-1.pdf>. Outside the OECD, central banks have adopted more adventurous trials of CBDC, particularly the People’s Bank of China which has tested digital renminbi in major commercial cities, including Shanghai and Shenzhen: Reuters, ‘Chinese central bank’s digital yuan given trial by lottery’ 2 June 2021 at <https://www.reuters.com/business/finance/chinese-central-banks-digital-yuan-given-trial-by-lottery-2021-06-02/>.

of transactions processed by central bank payments systems, by including consumer and non-financial sector payments.¹⁴⁶ That effect would be achieved by supplementing or replacing physical currency (physical banknotes and coins) with retail CBDC, thereby permitting lower-value payments in the real economy to be executed through electronic systems operated by central banks. That alteration of the monetary system would only have a marginal impact on the intermediated nature of monetary authority.¹⁴⁷ Commercial banks and other financial firms would retain their systemically critical position as the principal providers of credit (and, thereby, money) to individuals and non-financial firms, and would retain a role in processing consumer payments made via commercial bank accounts. Monetary policy would remain principally orientated towards financial sector counterparties. Monetary authority would remain strongly intermediated. As we note above, this minimally invasive approach to CBDC is the apparent preference of central banks in the OECD. At the ‘high dis-intermediation’ end of the spectrum, retail CBDC could lead to the replacement of financial sector entities (commercial banks and securities dealers) with ordinary people and non-financial firms as the principal monetary policy counterparties of central banks. For that effect to be achieved central banks would need to adopt retail CBDC as the primary monetary unit to settle extensions of credit and asset purchases with a view to influence broader economic conditions. That use of retail CBDC would radically dis-intermediate monetary authority, creating direct financial relationships between central banks and private individuals. It could also lead to a ‘total separation of banking and credit issuance functions of private banks’,¹⁴⁸ which some scholars believe could create real economic benefits.¹⁴⁹ Monetary policy operations would no longer assume the existence of financial sector counterparties (commercial banks and securities dealers). Monetary authority would be largely dis-intermediated.¹⁵⁰

The most in-depth mapping of that wide dis-intermediation of monetary authority via CBDC appears in Omarova’s ‘People’s Ledger’ proposal for the United States monetary system.¹⁵¹ Under that ‘blueprint for the comprehensive restructuring of the central bank balance sheet’ Omarova ‘advocates the issuance of general-purpose CBDC (the “digital dollar”), the concurrent migration of all transaction deposit accounts from private banks to the Federal Reserve’ and explores ‘the full range of new monetary policy options the proposed structural shift would enable’.¹⁵² The principal monetary policy

146 Central bank payment systems process high-value payments in the financial sector, rather than low-value payments in the real economy: see Committee on Payment and Settlement Systems, Bank of International Settlements, n 24 above.

147 Although it would imply rather complex technical considerations for payment system providers.

148 Gleeson, n 6 above, 153–154.

149 For example Barrdear and Kumhoff, n 132 above, 5.

150 Because central banks are public sector agencies, monetary accommodation provided by central banks to national governments raises thorny issues in determining the extent of intermediation of monetary authority: see text accompanying n 118 above.

151 S. Omarova, ‘The People’s Ledger: How to Democratise Money and Finance the Economy’ (2021) *Vanderbilt Law Review* (forthcoming) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3715735.

152 *ibid*, 1, 24, 25. Omarova proposes that some private deposit accounts held at ‘community banking institutions’ could operate as ‘pass-through’ accounts to CBDC at the central bank: *ibid*, 34–35.

tool in such an approach to dis-intermediation would become CBDC accounts held by all economic agents, as the central bank ‘modulate[s] the aggregate supply of money and credit by directly crediting and debiting the accounts of all participants in economic activity, without interposing intermediary-banks’ to implement both interest-rate setting and unconventional monetary policies (like QE).¹⁵³ Under Omarova’s proposal, the central bank would still conduct some monetary policy operations with the private financial sector, but only with a view to permitting commercial banks to access credit for lending to the real economy (rather than providing leverage for financial engineering) via a ‘conditionality’ rule on central bank credit which maximises ‘the flow of publicly-subsidized private credit to productive enterprise, as opposed to socially sub-optimal speculative activities’.¹⁵⁴

As Omarova recognises, such a re-organisation of the monetary system would have a profound impact on the structure of the financial system.¹⁵⁵ It would transform commercial banks into ‘non-depository lenders’ reliant on very targeted credit from the central bank or private capital markets to fund their lending activities and ‘remove the principal rationale for the continuing reliance on primary dealers’.¹⁵⁶ Within our model of intermediated monetary authority, the proposed implementation of CBDC would remove financial sector intermediaries (commercial and investment banks) almost entirely from the scheme of monetary authority and would obviate the need for marketable assets in the execution of monetary policy. Under Omarova’s proposal, the volitional aspect of the current scheme of monetary authority could also be removed, as a person’s CBDC accounts could simply be credited/debited directly by the central bank without the person consciously deciding to execute a transaction with the central bank.

Whether CBDC brings the minimally invasive changes currently preferred by central banks, or the more fundamental changes proposed by Omarova will depend on three legal and institutional factors. The first factor is whether access to central bank accounts and payment systems is extended to non-bank financial firms and, more importantly, non-financial firms and individuals. The second factor is the degree to which non-financial firms and individuals have access to central bank credit and asset purchase facilities, rather than simply being permitted to use their central bank accounts as participants in a payments system. The third factor is whether central banks use credit extensions and asset purchases with non-financial firms and individuals as instruments to execute monetary policy.

153 *ibid*, 26.

154 *ibid*, 40–41: under that proposal, central bank credit would be extended to commercial banks under collateral eligibility and specific activity limitations of debtor banks aimed at ‘explicitly preferencing certain categories of assets (such as, for example, loans to small and medium-size non-financial enterprises and minority-owned businesses, student loans, credit supporting development in underserved communities, bonds issued by firms in certain sectors of the economy, etc).’

155 Omarova deals extensively with the economic and social policy arguments for and against a transformation, *ibid*, II and III.

156 *ibid*, 51, fn 224.

Amending central bank and national currency statutes to permit individuals to maintain central bank accounts may be a technically demanding legal exercise, but is unlikely to transform the organisation of monetary institutions. If those amendments were made, however, the more momentous decision whether to execute monetary policy operations directly with individuals and non-financial firms would require very little legal adjustment, but an enormous change in the intellectual predicates of central bank personnel, implying a root-and-branch re-think of a number of fixed assumptions about the nature of the relationships between public institutions, private financial institutions and ordinary people in mixed economies. It would also inaugurate a fundamental shift in the balance of power between the financial and real economies, the boundary between monetary and fiscal power and the balance of economic power in society more generally. Reasonable minds will differ on whether the issue of electronic currencies by monetary institutions could catalyse such tectonic shifts in social institutions, and there is no guarantee that any CBDC actually deployed would fundamentally ‘democratise’¹⁵⁷ central bank operations. At this stage, our analysis is agnostic to the relative merits of expanding central banks’ powers to permit innovative deployments of their monetary authority. It is, however, critical not to lose sight of those deep institutional issues, despite the current sense of urgency and inevitability surrounding CBDC.

157 D. Woodruff, ‘To Democratize Finance, Democratize Central Banking’ (2019) 47 *Politics and Society* 593.