



A Guide to the Modern Monetary System in the 21st century

From Traditional Banking to FinTech and CBDCs

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In memory of my parents

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List of Abbreviations

AEA – American Economic Association
BBB - British Business Bank
BBLS - Bounce Back Loan Scheme
BIS – Bank for International Settlements
BNB – Bulgarian National Bank
BoE – Bank of England
CBDC – Central Bank Digital Currency
CBILS - Coronavirus Business Interruption Loan Scheme
CMA – Competitions and Market Authority
DFCB – Digital-first challenger banks
ECB – European Central Bank
e-CNY – Digital yuan
GFC – Global Financial Crisis
HSBC – Hong Kong and Shanghai Banking Corporation
IMF – International Monetary Fund
KYC – Know Your Customer
MBBG – Major British Banking Groups
MMT – Modern Monetary Theory
MSME – Micro-, Small-, and Medium-sized Enterprises
PBoC – People’s Bank of China
QE – Quantitative Easing
RLS - Recovery Loan Scheme
TBTF – Too-big-to-fail
UK – United Kingdom

Recommendations by Academics

“Clear, courageous, and encyclopedic in scope, this book guides readers from textbook myths to the empirical reality of money creation. It maps the three banking theories, shows why credit creation matters for growth and stability, and brings the story up to the age of fintech, challenger banks, and central bank digital currencies. With rare command of history and data, Dr Ivanov restores institutional detail to monetary economics and offers policy insights with real practical bite. Students, scholars, and practitioners will come away informed, empowered, and ready to reform.”

Prof. Richard A Werner, Professor in Banking, Finance and Economics; Inventor of Quantitative Easing (“QE”).

"A real tour de force. Written in a convincing manner, the author never backs down from telling the truth and pointing out the flaws in the traditional views on banking. If the assault on the citadel, like Keynes once said, is to be successful, well this is where it begins."

Prof. Louis-Philippe Rochon, Full Professor of Economics, Laurentian University, Canada.

“This volume explains the nature of money and the evolution of monetary systems on both theoretical and historical grounds. It provides a clear understanding of banks’ essential role in creating money when they grant loans to any kind of borrowers, and addresses the challenges for central banks with regard to commercial-bank issued digital forms of money. This book is a valuable guide for students, scholars, and policy-makers in both advanced and developing economies.”

Prof. Sergio Rossi, Full Professor of Macroeconomics and Monetary Economics, University of Fribourg, Switzerland.

“This book offers a fascinating comparison of competing banking theories and explores the evolution of money from the traditional banking system to the advent of Central Bank Digital Currencies. It is an essential read for both scholars and practitioners.”

Prof. Sylvio Kappes, Professor of Macroeconomics, Federal University of Alagoas, Brazil.

“This work reports research shedding fresh light on where money comes from and the workings of the banking systems. Dr Ivanov’s scholarship is wide-ranging and insightful, leading the reader on an eye-opening tour through diverse theories on how banking might work and presenting crucial empirical evidence on how it does in fact work. All of this is done with a watchful eye on what might be happening next, as challenger banks and central banks alike seek to exploit new technologies.”

Dr Richard Gunton, Senior Lecturer in Data Science, Queen Mary, University of London, United Kingdom.

Abstract

This book offers a clear map of what money and banking actually do today and why that reality matters for growth, stability, and democratic policy design. I begin by setting out the research questions, hypotheses, methods, and original contributions, situating the inquiry within two centuries of monetary debates and the recent turn to digital finance. The aim is pragmatic: to connect theory, evidence, and policy in a way that helps students, practitioners, and officials understand how modern systems create and steer money.

I organise the field around three families of banking theory: financial intermediation, fractional reserves, and credit creation. Confronted with central bank publications, balance sheet mechanics, and operational detail, only the credit view reliably matches how banks work in practice: lending creates deposits, not the other way round.

Building on this, I revisit the long Currency School versus Banking School debate and show how it has reappeared in modern guises, from sovereign-money proposals to central bank digital currencies. The question is enduring: should the state concentrate money issuance, or should credit remain decentralised within a regulated banking system? I trace the argument across history and into the present CBDC conversation, highlighting the trade-offs among stability, innovation, monetary sovereignty, and financial intermediation.

The book then turns to finance in practice. I examine the rise of FinTech and digital-first challenger banks in the United Kingdom and test the claim that they democratise finance. The evidence shows many of these institutions acting as “digital warehouses,” parking assets in central bank reserves or government securities while extending limited credit to the real economy. This pattern resembles elements of full-reserve designs and invites a sober reassessment of how innovation interacts with regulation and credit allocation.

Methodologically, the study combines conceptual analysis with empirical scrutiny of balance sheet data, case studies, and policy documents. The goal is not to pick a side in a doctrinal dispute but to show where each tradition illuminates contemporary institutions and where it misleads. The concluding chapters draw out policy implications: supervisors should track the purpose of credit, distinguish GDP-enhancing uses from speculative flows, and align rules so that banks, including new entrants, support innovation, employment, and resilient local economies. In short, by bringing theory and evidence together, the book provides a guide to the modern monetary system that is historically grounded, empirically anchored, and policy ready.

Chapter 1: Chronicles in Monetary Economics

If we were to employ the Oxford Dictionary definition of the word *theory*, it tells us that any theory must communicate to us “a formal set of ideas that is intended to explain why something happens or exists”. Yet, the study of money, more than any other field of economics, has been shrouded in complexity — not to reveal truth, but to obscure it as the great American economist John K. Galbraith (1975) observed: “The study of money, above all other fields of economics, is one in which complexity is used to disguise truth or to evade truth, not reveal it”. Nowhere is this more apparent than in the standard narratives of monetary economics, where dense mathematical models and intricate jargon serve as both a barrier to public understanding and a source of self-assurance for professional economists (Ravn, 2015, Rochon, 2023, 2024, Lavoie, 2012). The result is a discipline in which reality is not so much explained as it is reimagined, bent to fit the contours of abstract theories rather than the lived experiences of economic actors (Stiglitz, 2018).

For centuries, economic thought has relied on an idealized vision of human behavior — a rational, calculating agent endowed with perfect knowledge and infinite foresight (Anwar et al., 2024). This mythical figure - the construct of the founding fathers of economics from Adam Smith (1776) to John Stuart Mill (1840) and Frank Knight (1920) - is not merely an abstraction but a model that has come to shape human behavior, and thus the surrounding socio-economic world, rather than describe it. Astonishingly, behavioral economics has found that individuals now pattern their decisions according to economic theory, rather than theory being built upon observation of their real behavior (Ackert and Deaves, 2009)! Or as Raworth (2018) rightly puts it – a model *of* man has become a model *for* man. Guerrin (2004) wryly asks:

The question is [...]: how such intelligent people [i.e. political economists] can propose – and endlessly study – such stupid models?

Bernard Guerrin, 2004

Economic models often rest on highly abstract and unrealistic assumptions about both human behavior and the functioning of key (monetary) institutions such as banks, and even money itself (Stiglitz, 2018; Offer and Sodenberg, 2016; Galbraith, 2025; Lavoie, 2012, 2014). Despite their detachment from empirical realities, these models frequently inform real-world policymaking (King and Levine, 1993; Levine, 1997; Ivanov, 2025; Bofinger et al., 2024). The past few decades have seen economic decision-makers, from central bankers to finance ministers, treat these theories not as abstract hypotheses but as blueprints for economic design (Turner, 2012; Cable, 2016; Stiglitz, 2016; Djankov and Alesund, 2016; Varoufakis, 2022). Countries, particularly in the developing world, have been forced to conform their economies to such theoretical models rooted in free-market ideology (i.e. price and trade liberalization, privatization and austerity) (Sachs, 1993, 1997; Lipton and Sachs, 1990; Weber, 2023), often with disastrous socio-economic consequences, as Djankov et al. (2016: 108) observe some 25 years later: “Not everyone [in post-Communist Europe and the former Soviet bloc] has fared well ... in Ukraine PPP-adjusted GDP per capita decreased from USD 10,490 in 1990 to USD 8,267 in 2014”.

The results, as Vassilev (2001) underscores, is the outright “third worldization” of “second world” polities. Yet, the failures of these economic models have not led to their abandonment; instead, reality is expected to adjust to their dictates, rather than the models adjusting to reality (Werner, 2003, 2005).

What if, instead, we consider the reverse? Could it be that this faulty approach to economic modelling — beginning from an axiomatic world of unrealistic assumptions and then imposing its prescriptions on the real economy — lies at the very heart of the financial crises, inequality, and stagnation that define our era (Piketty, 2014; Stiglitz, 2015; Atkinson, 2012; Reinhart and Rogoff, 2014)? Economics, after all, is not a neutral science. As Galbraith (1970) noted in the context of the growing monopolies exerting greater influence over the policy formulation in the United States in the 1950s and 1960s: “In denying scientific recognition or legitimacy to this trend [i.e. big corporations wielding great market and political power], economic theory was not being politically and socially neutral. It was persuading its communicants to avert their eyes from reality”.

A quarter of a century on, economics continues to be a narrative, a story told by those in power, legitimized through textbooks, media, and institutions, including higher education institutions (Offer and Sodenberg, 2016; Harvey, 2014). This is why the intellectual (and biological) heir to John Galbraith, James Galbraith (2024), amongst many other scholars (Hendry, 2020, 2022; Stiglitz, 2018; King, 2016; Goodhart, 2017; Lavoie, 2005, 2012, 2014; Raworth, 2018), invites the economic profession to break with equilibrium (Bohm, 1978) dogma and re-found itself on the life principles that govern physics, biology and every existing mechanical and social system (Soddy, 1933; Tolstoy, 1904; Robinson, 1990).

Key to unlocking the interrelationships between humans, the economy and nature is the social network under which we run and operate our capitalist societies on a daily basis (Schumpeter, 1911). Thus, banks play a fundamental, central role in this intricate balance as they manufacture and allocate the most powerful of political resources – namely, money – in 21st century highly, digitized economy (Battilana et al., 2009; Ivanov, 2018; Binswanger, 2014; Lavoie, 2003, 2014; Carrera et al., 2025). In this context, a former JP Morgan Managing Director in the shadow of the Global Financial Crisis (GFC) nods in agreement: “I came to the understanding that the economic system is actually the root cause of the [capitalist] crisis, and that finance is what drives the economic system.” (Fullerton, 2015).

The GFC of 2007–2009, together with the COVID-19 pandemic, were watershed moments that forced economists, policymakers, and the general public to reconsider the role of money in the economy (Stiglitz, 2018; King, 2012, 2016; Goodhart and Jensen, 2015; Turner, 2012). Each crisis, in its own way, revealed fundamental truths about the nature of banking systems — truths long obscured by mainstream economic theories that treat money as a *neutral veil*: “‘money appears to enter and leave the economy ‘magically’ ... while the mechanism by which this occurs remains undefined” (Lucas, 1996 in Dianova, 2018), passively mediating transactions without exerting any real influence on economic outcomes (Fisher, 1911).

[E]ven in the most advanced industrial economies, if we strip exchange down to its barest essentials and peel off the obscuring layer of money, we find that trade between individuals or nations largely boils down to barter.

Paul Samuelson, 1973: 55

Yet, as Lord Skidelsky (2018: 22) argues, today’s banking and finance textbooks do little more than echo Aristotle’s ancient view of money, portraying banks as mere intermediaries, carefully omitting their true power in shaping economic outcomes (Marx and Engels, 1867; Lenin, 1911; Keynes, 1936; Schumpeter, 1911 [1934]): “Today’s textbooks on banking and finance do little more than echo Aristotle [on his view of the banking firm]. Banks simply ‘intermediate’ between buyers and sellers.” In the view of some, this is not accidental; it is a deliberate act of

obfuscation, designed to “conceal from citizens and politicians ... how the money system now works and how it could be made to work for the common good” (Huber and Robertson, 2001). In fact, the former Bank of England (BoE) governor, now economics professor at the New York Stern, gives us a hint as to the stagnation of economic thought about the role of banking, money and credit in the economy over the last century:

... if you read [monetary economics] work in the reverse order to that in which it had been written, you could see that the subject made some progress. The same might be said today about the subject of (monetary) economics ... money has disappeared from the picture altogether. Earlier generations of monetary economists would be baffled.

Sir Mervyn King, 2018: 21

Indeed, few things in human history have commanded such absolute belief as money, and the money system (Carruthers, 2009, 2020). It is an article of faith so deeply embedded in our consciousness that we rarely stop to question it – to the degree that it has disappeared from economics thinking. Unlike the gold and silver of centuries past, modern money is not backed by anything tangible; its value is conjured from sheer belief, a collective illusion sustained by the unwavering trust of billions (Ingham, 2005; Binswanger, 2014; Werner, 2005; Frost et al., 2023). As Yuval Noah Harari (2014) observes, “Trust is the raw material from which all types of money are minted.” This is a peculiar kind of faith — not faith in a divine power or moral order, but faith that others, too, will accept and conform to the same (digital) accounting-based illusion. “Whereas religion asks us to believe in something,” Harari continues, “money asks us to believe that other people believe in something.”

If money is ultimately founded on trust, the question arises as to how that trust is managed and manipulated within the institutional framework of 21st century modern monetary framework. The answer lies in the structure of the contemporary commercial bank system, which operates according to a set of practices that consistently shape and direct public perception about the origins and functions of money. Dominant interpretations — widely reflected in introductory and advanced economics textbooks alike deeply affecting policy discourse and financial media coverage — present commercial banks as passive intermediaries between savers and borrowers (Casu et al., 2015; Bernanke, 2017; Diamond and Dybvig, 1983; Samuelson, 1970). For instance, this view has been so deeply ingrained that even sophisticated macroeconomic models, such as those by Kiyotaki and Moore (1997) or Woodford (2003), omit money altogether. In these frameworks, banking plays no fundamental role beyond smoothing consumption and investment decisions (Abel et al., 2015; Bernanke, 2010). The traditional neoclassical narrative, rooted in the commodity theory of money, asserts that money arose naturally as an economical solution to the inefficiencies of barter — particularly the double coincidence of wants (Menger, 1871, 1888). Under this account, banking itself emerged merely to facilitate transactions, a belief that has dominated both economic thought and policy for centuries:

[I]t is undoubtedly the conventional view of money as a commodity, of monetary exchange as swapping goods for a medium of exchange, and of credit as the lending out of the money commodity, that has enjoyed the lion’s share of support from theorists and philosophers over the centuries, and thereby dominated economic thought – and, for much of the time, policy as well.

Martin, 2014: 16

This historical perspective has permeated both academic discourse and popular consciousness, creating an enduring myth that markets evolved from primitive barter. As Hart (2001: 266) observes:

It is remarkable how deeply inserted into the popular consciousness of Western societies is this idea that markets evolved from primitive barter.

However, this view does not accurately represent the empirical operations of commercial banks, as we shall establish later. In contrast to the textbook intermediation model, banks do not merely redistribute previously existing money. Rather, they actively create new money in the process of issuing credit (Borio, 2014; McLeay et al., 2014; Werner, 2014; Ryan-Collins et al., 2013; Rochon, 1999; Lavoie, 1984). Through double accounting procedures, commercial banks generate new deposits when they extend loans — a mechanism that effectively expands the money supply (Werner, 2016; Jakab et al., 2014). This endogenous money creation is not a peripheral aspect of the banking system but its central operating principle (King, 2016). Despite the importance of this mechanism, it has long been excluded from mainstream economic models and public discourse, a situation that has contributed to widespread misunderstandings about the nature of modern banking, monetary policy and the rise of central bank digital currencies (CBDCs) (Turner, 2012; Cable, 2016).

This misrepresentation is deeply embedded in the public’s perception of financial operations. The average individual participating in financial systems is unlikely to interrogate the institutional foundations of money creation. Attention tends to be directed toward more visible, surface-level economic phenomena — fluctuations in asset prices, interest rate changes, and macroeconomic statements by central authorities — rather than toward the underlying processes through which money is generated, distributed and circulated (Chupetlovski, 2021a; Lavoie, 2012, 2014; Kappes et al., 2024, 2025). Trust in the monetary system is maintained not through widespread understanding but through tacit acceptance of existing norms and representations (Ingham, 2005; Ivanov, 2018). In the words of a current, acting central bank governor: “to repeat, the fact that citizens may not easily distinguish between public and private money *is a good thing*” (Makhlouf, 2023, italics added).

Within this context, conventional financial education does not generally equip participants to critically assess the assumptions embedded in monetary policy or banking theory. Financial literacy programs typically reinforce the existing institutional arrangements by focusing on individual financial management — budgeting, saving, investing, and credit usage — without addressing the structural foundations of money creation and distribution (Raworth, 2018; Chupetlovski, 2021b, 2021c). As such, financial education often operates to entrench belief in the efficiency and neutrality of existing banking practices. Concepts such as fractional reserve banking and market-based risk allocation are taught as stable features of an objective system rather than as constructs contingent on political and institutional design (Marx and Engels, 1867; Varoufakis, 2013; Ivanov, 2018). As a result, participants in financial systems are rarely prompted to critically question the legitimacy or distributional consequences of these mechanisms (North, 1990; North and Weingast, 1989; Acemoglu et al., 2005; Acemoglu and Robinson, 2012; Acemoglu and Johnson, 2023).

The GFC laid bare the illusion that financial markets are self-regulating (Bernanke, 2008; Greenspan, 2006, 2008) and that banking institutions merely channel pre-existing savings into productive investment (Casu et al., 2015). The credit boom that preceded the crisis saw commercial banks engage in an unprecedented expansion of mortgage lending, inflating

housing prices and fuelling speculative bubbles (Duan et al., 2018, Duan et al., 2019, Bezemer et al., 2018), in strikingly similar fashion as the run up to the Great Depression (Kumhof and Rancière, 2010). When the tide turned, the financial system stood on the brink of collapse. Major banks, many deemed "too big to fail" (or, as some have cynically put it, "too big to jail"), faced insolvency (Ioannou et al., 2019; Marshall and Rochon, 2019, 2023). The images of long queues of depositors outside collapsing mortgage banks became emblematic of the crisis, as households rushed to withdraw their savings, either transferring funds to institutions perceived as more stable or converting them into central bank money — physical cash, the ultimate safe haven in times of uncertainty (Turner, 2012; Cable, 2016).

In response, central banks around the globe embarked on a unprecedented historic intervention, deploying extraordinary monetary policies to prevent a complete meltdown of the financial system. The introduction of large-scale quantitative easing ('QE') policies (Werner, 1992, 1997, 2003) flooded (interbank) markets with liquidity, yet with strikingly different outcomes across regions (Werner, 2016; Reis, 2023). In the United States, where the Federal Reserve's interventions were swift and decisive in purchasing large proportions of non-performing loans (i.e. repairing the banks' balance sheets) (Werner, 2012, 2014), the recovery was comparatively strong (Werner, 2018; Lee and Werner, 2022). In the European Union, however, the European Central Bank's (ECB) cautious and delayed response resulted in prolonged socio-economic stagnation (Lavapitsas, 2014; Varoufakis, 2013; Stiglitz, 2012, 2015, 2016), setting the way for low economic growth, triggering further calls for economic restructuring (Draghi, 2024). These differing trajectories underscored the profound power that monetary authorities wield — not as neutral actors, but as architects of economic fate.

Fast forward a decade, and another crisis emerged — this time, in the form of a global pandemic (WHO, 2020). COVID-19 prompted an equally radical monetary response, with independent central banks (Forder, 1998, 2001) effectively, adopting the Modern Monetary Theory (MMT) analytical prism (Kelton, 2020), monetizing vast amounts of public and private debt to sustain economic activity in the midst of supply-side shortages (Sunak, 2020; Bailey, 2020; Lagarde, 2020; Draghi, 2020). While this unprecedented injection of liquidity, yet another QE round, was initially seen as a necessary lifeline, it eventually contributed to inflationary pressures, particularly in periphery economies, where loose monetary policy coincided with supply chain disruptions.¹

Yet, unlike the GFC, when people clamored for physical cash as a safe store of value, the COVID-19 pandemic triggered a dramatic shift away from banknotes. Physical currency, once considered the ultimate refuge in times of crisis, was suddenly viewed as a vector of contagion — the curse of cash, as Rogoff (2016) prophetically labelled it. Households and businesses alike became entirely dependent on the (private) commercial banking sector and its digital payment infrastructure to conduct their daily lives — whether in consumption, production, or financial transactions within or across borders. This behavioral shift amongst "debt consumers" laid bare a paradox: while central bank money remained the foundation of the financial system, its relevance in everyday economic life was increasingly called into question.

The newly-installed BoE governor, Andrew Bailey (2020), soon lamented that monetary policy alone is insufficient to address the economic ills in the midst of the COVID-19 crisis: "[the use of monetary policy alone] would strain [its] bounds ... calling into question the effectiveness

¹ For instance, in periphery countries with outsourced monetary policy such as Bulgaria, where ECB-driven QE policies exacerbated local inflationary trends, ironically, creating a temporary stop to joining the very eurozone under the ECB's watch (Nenovsky, 2025).

of the institution that deploys it”. Thus, he urged for an active fiscal policy – “the state was back in the game” to paraphrase Joshua Ryan-Collins’ (2020) cheer on Twitter back then. In other words, the new hawk of British monetary policy quasi-adopted a long-standing post-Keynesian view about the general ineffectiveness of monetary policy, and the need for fiscal interventions: “I have grown somewhat disillusioned with monetary policy”, as a leading post-Keynesian economist put it (Rochon, 2022: 20). Box 1 below depicts the conventional narrative about the interaction between monetary policy and the real economy.²

Box 1: What is Monetary Policy?

Definition and Objectives: Monetary policy refers to actions by a central bank to influence the money supply and interest rates. In the UK, the Bank of England’s primary goal is price stability – keeping inflation around the 2% target. By changing its policy interest rate, the Bank alters borrowing costs and demand: higher rates tend to slow inflation, while lower rates encourage growth.

Historical Context: British monetary thought dates to the early 19th century, at least. David Ricardo’s *High Price of Bullion* (1810) linked excess note issuance to rising prices and argued that convertible banknotes issued by a public bank would stabilize currency value. His Currency School views underpinned reforms such as the 1844 Bank Charter Act. Later economists introduced new approaches, but maintaining a stable money supply remained a common theme.

Modern UK Framework: Since the late 1990s the UK has employed an explicit inflation-targeting regime. The Bank of England’s Monetary Policy Committee (MPC) was granted operational independence to set policy. The government fixes a 2% consumer price inflation target, and the MPC adjusts the Bank Rate to hit it. A credible record of low, stable inflation helps anchor expectations. The MPC meets regularly and publicly announces its rate decisions.

Conventional Policy Instruments:

- **Policy interest rate (Bank Rate):** The MPC’s main tool is the short-term policy rate. By raising or lowering this rate, the Bank of England influences all other interest rates in the economy. Cutting the Bank Rate reduces borrowing costs (stimulating spending), while raising it tends to restrain inflation.
- **Open-market operations (OMOs):** The Bank buys or sells government bonds to manage liquidity and ensure market rates stay aligned with the policy rate. Buying bonds injects reserves into the banking system, while selling bonds withdraws reserves – both actions helping to steer short-term rates and funding availability for the commercial banking sector.

For example, the UK abolished reserve requirements in 1981, so monetary policy now focuses on interest-rate and open-market instruments. In practice, official monetary policy is enacted by adjusting these tools to influence credit conditions and aggregate demand.

Unconventional Measures (Post-2008): During recent crises the Bank of England has also used unconventional instruments. Since 2009 it carried out large-scale asset purchases (also known Quantitative Easing “QE”) to lower long-term borrowing costs when the policy rate was near zero. It has also given explicit forward guidance on future policy. These non-standard measures supplement – but do not replace – the traditional tools of UK monetary policy.

² For an alternative post-Keynesian view, please refer to Godley and Lavoie (2007) or Lavoie (2012, 2014).

The ineffectiveness of monetary policy levers and channels has, unsurprisingly, spurred central banks into actions to reinvent and reassert themselves in the digital monetary landscapes of the 21st century (Rossi, 2025; Ivanov, 2025; BIS, 2021). Long resistant to technological change and advancements, these institutions now find themselves playing catch-up, scrambling to establish a foothold in the digital currency landscape that they once ridiculed (Ivanov and Werner, 2025). The conversation around CBDCs has intensified over the last decade or so (Dianysopolous et al., 2024). Having lagged behind the technological revolution for decades, central banks are now making an urgent push into the 21st century — perhaps some 20 or 30 years late, but with a newfound determination to reshape the monetary order. Or as a recent paper, presented at the premiere economic conference, organized by the American Economic Association (AEA), was tellingly entitled: “A New Tool for Economic Policy: Central Bank Digital Currencies”, demonstrates the latest tool to be developed and included in the very rich, yet potent (as BoE’s Governor Andrew Bailey (2020) bemoaned), monetary policy arsenal in the hands of central bankers around the globe.³

These developments in financial markets are not merely academic. They challenge the long-held assumptions of (mainstream) monetary economics, which have often obscured rather than illuminated the true workings of the financial system (Rossi, 2025; Galbraith, 1970, 1973, 1975). From the misplaced belief in the neutrality of money (Fisher, 1911; Lucas, 1996) to the enduring myth that barter preceded the emergence of money (Skilledsky, 2018; Ingham, 2005; Menger, 1871, 1888; Casu et al., 2015), orthodox economic thought has frequently served to deflect critical scrutiny from the actual mechanisms of money creation and financial power (Schumpeter, 1911 [1934]; Sombart, 1931; Hahn, 1920; Lavoie, 1984, 2003, 2012, 2014). In reality, private commercial banks do not simply intermediate between savers and borrowers; they create money through lending, a function that gives them immense influence over economic trajectories (King and Levine, 1993; Levine, 2007; Lavoie, 2012, 2014; Ivanov, 2018, 2025; Duan et al., 2024, 2025). Or to return to what Lord Skidelsky (2018) observed, today’s banking and finance textbooks continue to cling to an Aristotelian view of money, disguising the actual power dynamics at play. Unsurprisingly, one of the most seasoned and reputable economists in recent memory, Noble Prize winner Joseph Stiglitz (2012) advises newcomers to the profession ‘to study economics, but study it with skepticism and study it within the broader context’.

This book seeks to contribute to the critical analysis of these developments in the 21st century digital money order. It interrogates the prevailing assumption that modern money is a neutral instrument and that contemporary banking functions primarily as a benign intermediary between savings and investment. It argues that the current financial architecture is better understood as a political construct, shaped by decisions about who has the authority to issue digital money, how much and under what conditions, and for whose benefit. This framework necessitates a reevaluation of monetary governance, financial education, and institutional accountability. Understanding the mechanisms of money creation and allocation in the 21st century highly-digital economy is indispensable for those who seek to reform or democratize the financial system.

This book is therefore intended for readers willing to critically engage with these structural dynamics.

³ Inexhaustive list of central bank privileges include currency issuance (i.e. seigniorage), rights to grant and withdraw bank licensing, setting of base / benchmark interest rates as well as reserve requirements, open market operations, setting the minimum guarantee of bank deposits (i.e. bank liabilities).

1.1. Research Questions, Aims and Objectives

The financial landscape of the United Kingdom (UK) has undergone profound changes in the aftermath of the GFC, with banking institutions adapting to new regulatory frameworks, technological disruptions, and shifting consumer expectations. At the heart of these transformations lies a crucial debate: who should control the creation and allocation of money in the economy?

While commercial banks have historically dominated money creation through lending (Ryan-Collins et al., 2013; Lavoie, 1984), recent developments — ranging from the rise of FinTech firms and challenger banks to discussions on CBDCs — suggest a potential recalibration of this power (Rossi, 2025; Bibi, 2025). The growing interest in alternative banking models, such as full-reserve banking (Jackson and Dyson, 2012; Dyson et al., 2016; Laina, 2015; Benes and Kumhof, 2015; Wolf, 2014a, 2014b), further underscores the need to reassess the role of credit institutions in an era where digital innovation has redefined traditional banking relationships (Duan et al., 2024; Dianopolous et al., 2024). This research, therefore, seeks to interrogate these shifts and assess their implications for financial stability, economic growth, and the future of monetary policy.

At the core of this academic inquiry is the question of whether new financial players — particularly challenger banks (see Box 2 for definitions of key terms) — have meaningfully disrupted the established banking order or merely replicated existing structures under the guise of financial, in particular payment, innovation (Auer et al., 2021, 2022; Temperini et al., 2023; Makhlouf, 2023). Despite their branding as alternatives to legacy institutions, many digital-first challenger banks (DFCBs) function more along the lines of payment service providers or financial warehouses, rather than true credit manufacturers and planning entities (Hudson and Goodhart, 2017; Lavoie, 2003, 2012, 2014). Simultaneously, central banks are exploring ways to regain control over the money supply (Rochon, 2022; Rossi, 2025), with CBDCs positioned as a potential *public* counterweight to private bank-issued digital money (Dianopolous et al., 2024; Auer et al., 2021). This study critically examines whether these developments signal a fundamental transformation in the financial system or if they merely represent a continuation of historical banking hierarchies under a 21st century digital guise (King, 2016; Goodhart, 2017; Stiglitz, 2018). By addressing these questions, this research contributes to a broader understanding of the evolving nature of banking, the role of credit creation, and the mechanisms that underpin financial power in contemporary capitalism.

Box 2: Key Terms Explained

Key Terms Explained

FinTech (Financial Technology): FinTech refers to technology-driven firms that innovate across the financial services industry by introducing new platforms, processes, and expectations around speed, accessibility, and efficiency. FinTechs often leverage advanced technologies to reshape how individuals and businesses interact with financial products and services.

Traditional Banks (Brick-and-Mortar / Too-Big-to-Fail Banks): Traditional banks are established financial institutions with physical branch networks and large operational structures. Often categorized as "too big to fail," these banks are deeply embedded in the financial system and usually benefit from implicit or explicit government support due to their systemic importance.

Challenger Banks: Challenger banks are digital-first commercial banks that operate without the extensive branch networks of traditional banks. They offer a full range of banking services primarily through mobile apps and / or online platforms, enabling faster, cheaper, and more personalized customer experiences. Major examples in the UK include Starling Bank, Revolut, Atom and Monzo.

Research Questions

Amidst the shifting dynamics of the British banking system, this study seeks to address the following key questions:

1. As central banks strive to reclaim influence over the monetary system through the introduction of CBDCs, what strategies can they implement to establish these as credible alternatives to commercial bank-issued digital money?
2. Can technology-driven financial *intermediaries*, such as challenger banks, function as experimental platforms for testing alternative banking models, including full-reserve banking?
3. Have FinTech challenger banks genuinely transformed the financial sector, or has their emergence failed to diminish the dominance of traditional banking giants?

Research Aims and Objectives

This research examines the evolution of money and banking, with a particular focus on digital innovation and its implications for financial stability. The core aims and objectives are:

1. To critically evaluate the role of challenger banks in reshaping the financial ecosystem and their viability as models for alternative banking systems, such as full-reserve banking.
2. To analyze the potential tools and policies available to central banks in reasserting their influence over the monetary system, especially through the adoption of CBDCs.
3. To investigate whether the rise of digital finance has led to a meaningful shift in power between traditional banking institutions and emerging financial intermediaries.

1.2. Research Hypothesis

Hypothesis 1: The endogenous creation of money by commercial banks is the principal mechanism of monetary expansion in contemporary economies.

Hypothesis 2: The rise of digital-first challenger banks represents a convergence toward full-reserve banking principles, inadvertently reviving historical Currency School arguments within the context of digital finance.

Hypothesis 3: Public sector interventions to nationalize, or regulate, the digital money supply (e.g., through CBDCs) are driven primarily by the need to reassert monetary sovereignty in response to private sector-led financial innovation.

1.3. Methods

The methodology of this study is rooted in a purposive sampling strategy, specifically selecting FinTech firms whose operational bank models closely align with the principles of full-reserve

banking. Challenger banks such as Atom and Starling are analyzed not arbitrarily but deliberately, due to their distinctive asset structures and liquidity management practices. Their balance sheet compositions, alongside financial ratio analyses, serve to ground the theoretical insights from the visions about the future monetary order in empirical reality. This purposive selection ensures that the research remains tightly focused on firms that are most relevant to the evolving dynamics between private credit creation and state control over the money supply.

An extensive, critical literature review of the three dominant theories of banking — the Financial Intermediation Theory, the Fractional Reserve Banking Model, and the Credit Creation Theory — forms the conceptual backbone of the study. These competing theoretical frameworks are contrapositioned against the first systematic empirical investigations into banking operations, alongside emerging research particularly central bank research and top-grade academic studies, which consistently validate only the Credit Creation Theory as consonant with how real-world commercial banks function. This empirical-theoretical synthesis provides the foundation to untangle the enduring 200-year-old debate in political economy: who should control the money supply — public institutions (such as central banks) or private entities (such as commercial banks)?

Finally, the study employs a critical, historical-analytical method to bridge this debate to the contemporary emergence of Central Bank Digital Currencies (CBDCs). Drawing upon white papers, cutting-edge research articles, central bank reports, and fintech industry publications, the research constructs a coherent narrative that explains current phenomena through the lens of a "theory" — as defined by the Oxford Dictionary — namely, a system of ideas intended to explain something. This integrated approach, combining critical review, empirical financial analysis, and political-economic inquiry, enables the study to offer a novel framework for understanding how technological innovation intersects with longstanding struggles over monetary sovereignty.

1.4. Original Contributions of the Study

This study presents several original contributions to the existing literature on money, banking, and financial stability by bridging historical monetary debates with contemporary developments in FinTech and central banking. The key contributions are as follows:

- **A Critical Review of the Currency vs. Banking School Debate Across Two Centuries:** The research offers a comprehensive historical analysis of the Currency vs. Banking School debate, tracing its intellectual evolution from Ricardo (1824) to Fisher (1935) and modern monetary theorists (Dyson et al., 2016; Dyson and Jackson, 2012; Kumhof, 2017). By critically reassessing these debates through the lens of contemporary financial structures, this study provides fresh insights into their enduring relevance in shaping monetary policy and financial regulation today.
- **Clarifying the Role of Banks as Issuers of the Money Supply in the Digital Age:** The study refines our understanding of how banks function as primary issuers of the money supply, extending this role into the digital era (Werner, 2014, 2016; Lavoie, 1984, 2014; Godley and Lavoie, 2007). By emphasizing the fact that commercial banks now issue the vast majority of digital money (Ryan-Collins et al., 2017; King, 2016; Borio, 2014; Duan et al., 2024, 2025), this research clarifies the implications of this power for financial stability, economic cycles, and the evolving role of central banks.

- **Bridging the Gap Between Historical Monetary Theory and Contemporary Debates on CBDCs:** While discussions on the Currency vs. Banking School have historically remained within macroeconomic and monetary theory, this study connects them with contemporary debates on CBDCs (Auer et al., 2021; Temperini et al., 2023; Dianysopolous et al., 2025). By doing so, it demonstrates how CBDCs can be interpreted as an attempt to realign the monetary system closer to the Currency School's principles, countering commercial bank dominance in digital money creation.
- **Integrating Microeconomic Research on Challenger Banks (FinTechs) with Monetary Theory:** The study critically links macro-level debates on monetary policy with micro-level research on challenger banks such as Monzo, Revolut, Atom, and Starling in the UK. By analyzing the asset composition of these banks, this research situates them within the broader structural dynamics of financial capitalism (Epstein, 2005; Ivanov, 2022; Werner, 2005), revealing their potential role as facilitators or disruptors of the existing monetary order.
- **Exposing the 50% Reserve Banking Model and the Socialization of Risk:** Through an empirical analysis of the asset structures of Atom and Starling Bank, this study highlights the emergence of a *de facto 50% reserve banking model (i.e. assets allocation with central public authorities)*. It critically examines how these banks rely on government-backed SME lending schemes, effectively socializing potential losses while privatizing profits (Ryan-Collins, 2019; Hudson, 2010). This research sheds light on the implicit public underwriting of private financial ventures, a phenomenon often overlooked in discussions on financial innovation.
- **Assessing the Role of FinTechs as Full-Reserve Banks and Potential Retail Arms of CBDCs:** The research demonstrates that leading FinTech firms, particularly Monzo and Revolut — collectively holding around 20 million UK customers — are positioned to act as retail distribution channels for CBDCs (Auer et al., 2021, 2022). Given their *near full-reserve banking structure (i.e. asset allocation of nearly 100% with central public authorities)*, this study evaluates the feasibility of these entities becoming *intermediaries* between central banks and the public, potentially reshaping the monetary ecosystem (Temperini et al., 2023).
- **Critically Evaluating the Impact of Challenger Banks on Credit Allocation and Economic Activity:** While challenger banks market themselves as disruptors of the traditional banking system, this study critically assesses their actual role in credit allocation (Werner, 2005; Ryan-Collins et al, 2018). The research reveals that, rather than fostering new forms of Keynesian (1930, 1936) productive credit to accommodate Schumpeterian (1911 [1934], 1954) entrepreneurial spirits, many of these entities function as financial warehouses, contributing little to real economic investment beyond government-backed lending initiatives (Ivanov, 2025). This finding challenges the prevailing narrative of FinTech-driven financial democratization and calls into question the broader implications for economic growth and financial stability.

By synthesizing long-standing, unresolved debates in monetary economics with contemporary developments in banking and digital finance (Dianysopolous et al., 2024; Auer et al., 2021;

Temperini et al., 2023), this study makes a significant contribution to both theoretical and policy-oriented discussions on the future of money, banking, and credit creation (King, 2016; Cable, 2016).

1.5. Structure of the Study

This book is structured to critically examine the evolution of banking and monetary mechanisms in the 21st century, positioning the ongoing FinTech revolution within the broader historical and theoretical debates of monetary economics (Ricardo, 1824, Fisher, 1935). Each chapter builds upon the preceding analysis, weaving together theoretical insights, empirical findings, and policy considerations to assess the present-day and future trajectory of money, banking, and financial stability.

Chapter 1: Chronicles in Monetary Economics

Chapter 1: *Chronicles in Monetary Economics* encapsulates the motivation behind this study, outlining the research questions, key hypotheses, and the overall structure of the book. It situates the inquiry within the broader developments in monetary economics, charting the evolution of conflicting views about the nature of money and banking

Chapter 2: A Triad of Truths: A Deep Dive into the Three Theories of Banking

The study begins with a critical examination of the three dominant theories of banking: the financial intermediation theory (Draghi, 2006; Casu et al., 2015), the fractional reserve banking model (Abel et al., 2015; Keynes, 1930), and the credit creation view (Schumpeter, 1911; Keynes, 1930; Lavoie, 1984, 2012, 2014; Galbraith, 1970). While conventional economic textbooks continue to portray banks as mere intermediaries channeling existing savings into investment, a growing body of empirical and theoretical research challenges this outdated perspective (Borio, 2014; King, 2016; Goodhart, 2017; Bundesbank, 2017; Bank of England, 2014; Werner, 2014). The fractional reserve theory, which acknowledges banks' collective role in creating money through lending but assumes constraints tied to reserves, similarly falls short of describing the actual mechanics of modern banking (Banque du France, 2018; ECB, 2025; Jakab et al., 2014). Instead, the credit creation view — whereby banks create new money *ex nihilo* through the lending process — proves to be the most accurate representation of banking activity (Schumpeter, 1911; Veblen, 1905; Rochon, 1999; Kappes et al., 2025; Ivanov, 2025b). By laying out these competing theoretical frameworks, this chapter establishes the foundation for the empirical and policy-oriented discussions that follow.

Chapter 3: Beyond Theories: Empirical Realities of Banking Practices and the Resurgence of the Currency vs Banking School Debates

Building upon the theoretical foundations laid in Chapter 1, Chapter 2 presents some empirical evidence demonstrating that only the credit creation view aligns with how banks actually function (Werner, 2014). Banks are not neutral intermediaries but rather powerful actors that shape economic activity (King and Levine, 1993; Bofinger et al., 2024; Ivanov, 2018), often driving financial (in)stability through (pro-)cyclical credit allocation (Kumhof, 2017; Benes and Kumhof, 2015; Mynsky, 1979, 1983).

This reality (re-)activated the long-standing Currency vs. Banking School debate, which originated in the 19th century but remains highly relevant today (Ricardo, 1824; Marx and Engles, 1848; Lenin, 1911; Robinson, 1951; Dyson and Jackson, 2012; Dyson et al., 2016; Laina, 2015). The Currency School argued for strict state control over money issuance, fearing

financial instability if left to the private sector (Dyson et al., 2016; Wolf, 2014a, 2014b), whereas the Banking School advocated for a decentralized, market-driven monetary system (Goodhart and Jensen, 2015; Arnon, 2011; Dawd, 1992). In the 21st century, this debate takes on new significance: should financial stability be achieved through the centralization of money creation via state-backed CBDCs, or does the persistence of oligopolistic private banking structures mean that market-driven solutions remain dominant? In this context, central banks — struggling to adapt to the realities of endogenous, digital money — are seeking to reinvent themselves through CBDCs, a policy tool that remains more myth than reality (Auer et al., 2021, 2022; Temperini et al., 2023; Rossi, 2025; Dianosoupoulos et al., 2024; Ivanov and Werner, 2025).

Chapter 4: Methodology

This chapter outlines the research design and methodology employed in the study. Given the complexity of the research questions, this research piece adopts a multi-method approach that combines empirical data scrutiny of purposively-sampled case studies (i.e. digital-first challenger banks in the UK – Monzo, Revolut, Atom and Starling) and theoretical interplay, where one never loses track of the other (as Schumpeter (1954) advised).

Moreover, the study categorizes bank assets into three broad groups: (1) holdings with central banks and government securities (i.e. the Currency School's vision of centralized money creation only), (2) investments in the real and financial economy, including mortgages (i.e. the Banking School's vision for supporting demand-driven, entrepreneurial animal spirits (Keynes, 1936; Schumpeter, 1911 [1934], 1951; Lavoie, 2012), and (3) speculative financial assets such as derivatives and equities (Ivanov, 2025; Mynsky, 1981; Macauley, 2024; Werner, 2003, 2005; Hudson, 2010). This classification allows for an objective assessment of banking practices in the context of the current debates about the present and future of monetary order.

Chapter 5: The Ghost of Narrow Banking: Are Challenger Banks Embodying an Old Economic Dream?

This chapter moves from macroeconomic and theoretical considerations to a micro-level analysis of digital-first challenger banks, investigating their role in the broader banking system. Using two case studies (i.e. Monzo and Revolut), it demonstrates that these institutions function more along the lines of financial warehouses than traditional commercial banks, as they do not engage in commercial lending (Annual Reports, 2024). Their operational model, centred on fee-based services and deposit storage, makes them potential candidates to serve as "retail arms" for future CBDCs (Auer et al., 2021, 2022; Temperini et al., 2023), particularly given their near-full-reserve banking structure (Benes and Kumhof, 2015; Dyson and Jackson, 2012; Dyson et al., 2016). Meanwhile, two other case studies (i.e. Atom and Starling Bank), though appearing more conventional in their banking activities, operate under a 50% reserve banking framework. However, a closer examination reveals that much of their SME lending is underwritten by government-backed schemes via the British Business Bank (Annual Reports, 2024). In effect, these institutions, rather than disrupting the financial status quo, act as conduits for public sector credit distribution (Ricardo, 1824; Marx and Engels, 1848; Lenin, 1911, 1917 Fisher, 1935). This analysis sheds light on the paradox of financial innovation: while challenger banks claim to provide alternative banking models, many remain deeply embedded within state-sponsored financial mechanisms.

Chapter 6: Conclusions

The final chapter synthesizes the key findings of the study, reflecting on the broader implications for monetary policy, financial stability, and the future of money. It argues that while challenger banks has introduced significant changes in consumer banking behavior, it has not meaningfully challenged the dominance of large commercial banks in credit creation. Instead, the emergence of some challenger banks has reinforced pre-existing trends: some operate as quasi-public institutions distributing state-backed credit, while others serve as digital warehouses, as envisioned by Currency School advocates, that could facilitate the rollout of CBDCs. The study concludes that the British banking system remains characterized by a privatization of profits and a socialization of risks. Ultimately, the research calls for a more comprehensive reassessment of banking models, regulatory frameworks, and the evolving role of central banks in tandem with the ‘new kids’ on the block, the digital-first challenger banks, in shaping the monetary system of tomorrow.